Computer algebra independent integration tests

3-Logarithms/3.2.1-f+g-x-^m-A+B-log-e-a+b-x-over-c+d-x-^n-^p

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June 29, 2021 Compiled on June 29, 2021 at 2:59pm

Contents

Chapter 1

Introduction

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

The number of integrals in this report is [314]. This is test number [59].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 91.72 (288)	% 8.28 (26)
Mathematica	% 94.90 (298)	% 5.10 (16)
Maple	% 59.55 (187)	% 40.45 (127)
Maxima	% 75.80 (238)	% 24.20 (76)
Fricas	% 66.88 (210)	% 33.12 (104)
Sympy	% 37.58 (118)	% 62.42 (196)
Giac	% 48.41 (152)	% 51.59 (162)
Mupad	% 63.69 (200)	% 36.31 (114)

Table 1.1: Percentage solved for each CAS

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

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

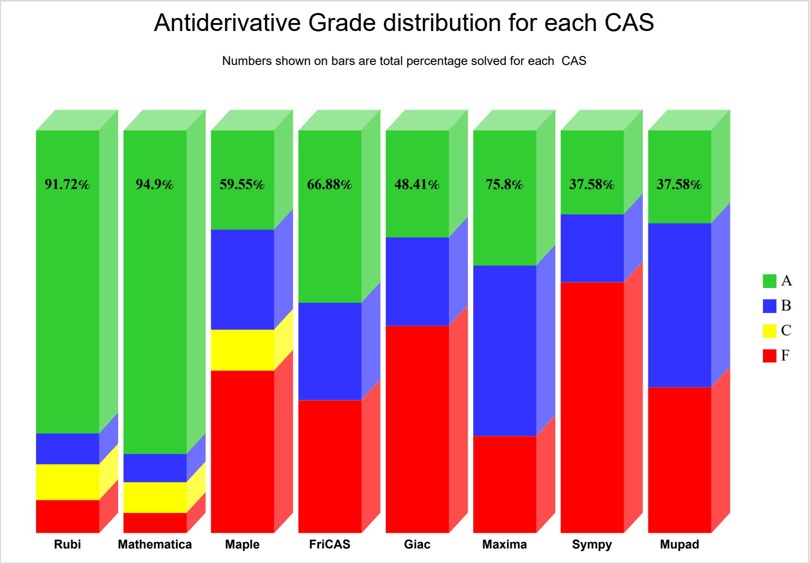
Table 1.2: Description of grading applied to integration result

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

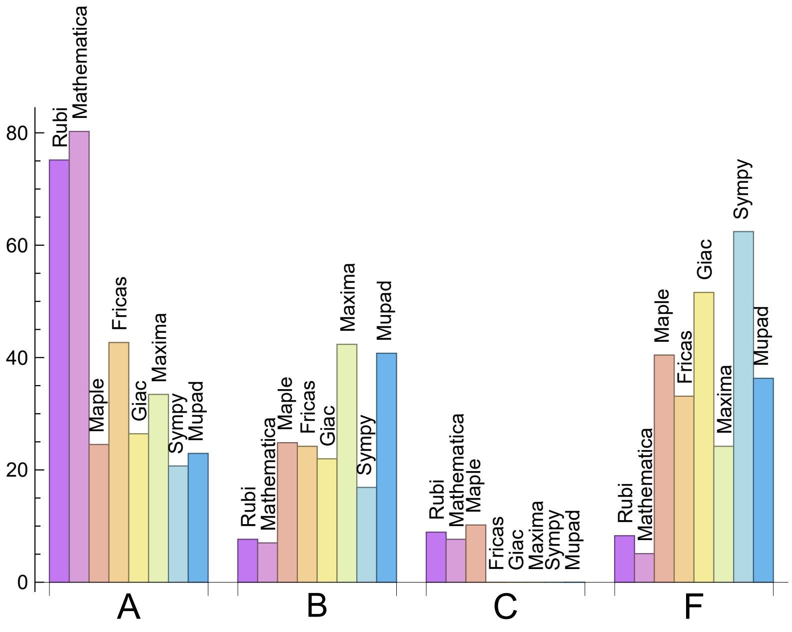
System	% A grade	% B grade	% C grade	% F grade
Rubi	75.16	7.64	8.92	8.28
Mathematica	80.25	7.01	7.64	5.10
Maple	24.52	24.84	10.19	40.45
Maxima	33.44	42.36	0.00	24.20
Fricas	42.68	24.20	0.00	33.12
Sympy	20.70	16.88	0.00	62.42
Giac	26.43	21.97	0.00	51.59
Mupad	22.93	40.76	0.00	36.31

Table 1.3: Antiderivative Grade distribution of each CAS

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



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



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

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	26	100.00 %	0.00 %	0.00 %
Mathematica	16	100.00 %	0.00 %	0.00 %
Maple	127	100.00 %	0.00 %	0.00 %
Maxima	76	100.00 %	0.00 %	0.00 %
Fricas	104	92.31 %	7.69 %	0.00 %
Sympy	196	24.49 %	60.20 %	15.31 %
Giac	162	40.74 %	58.02 %	1.23 %
Mupad	114	100.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

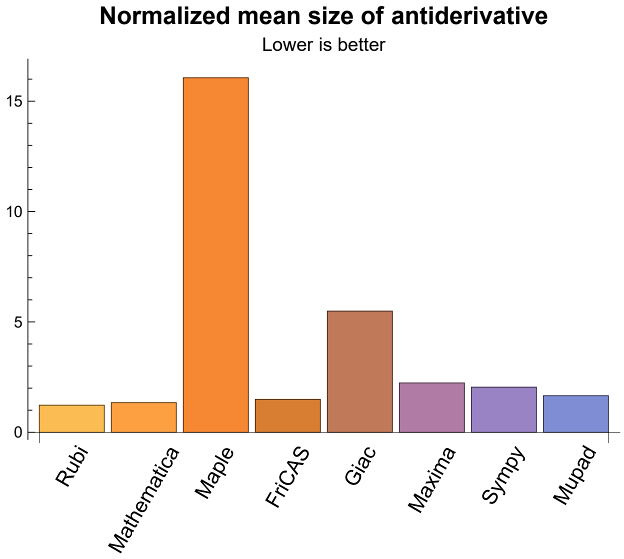
1.3 Performance

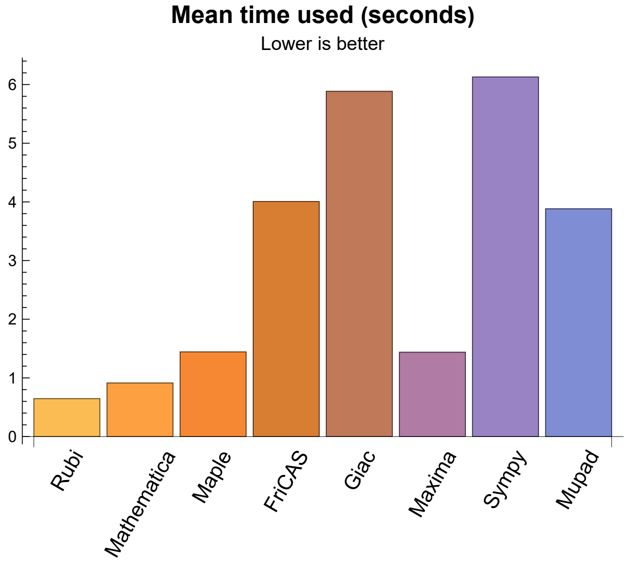
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.65	340.11	1.23	179.00	1.00
Mathematica	0.91	374.14	1.34	142.50	0.93
Maple	1.44	5560.30	16.06	452.00	3.19
Maxima	1.44	633.40	2.24	368.50	2.37
Fricas	4.01	343.14	1.49	161.00	1.54
Sympy	6.13	351.95	2.04	131.00	2.20
Giac	5.89	942.50	5.49	288.50	1.82
Mupad	3.88	417.30	1.66	160.00	1.54

Table 1.5: Time and leaf size performance for each CAS

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





1.4 list of integrals that has no closed form antiderivative

{19, 20, 21, 24, 25, 26, 47, 48, 49, 52, 53, 54, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 109, 110, 111, 114, 115, 116, 137, 138, 139, 142, 143, 144, 191, 192, 193, 196, 197, 198, 219, 220, 221, 224, 225, 226, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

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

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

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

```
try:
```

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

  except Exception as ee:
         leafCount =1
```

1.9.4 Important note about Mupad results

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

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

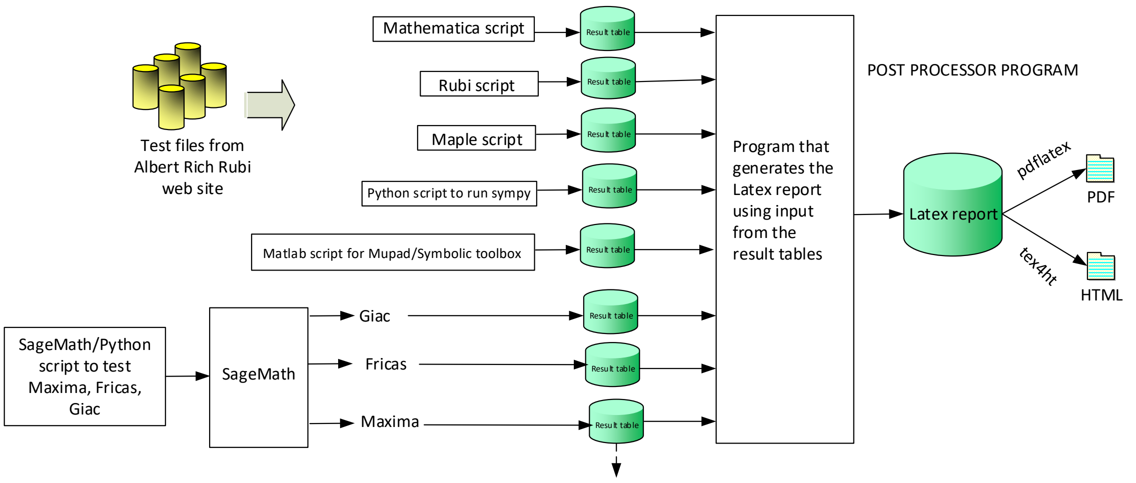
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



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

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

    The following field present only in Rubi and Mathematica Tables

13. integer. 1 if result was verified or 0 if not verified.

    The following fields present only in Rubi Tables

14. integer. Number of rules used.
15. integer. Integrand leaf size.
16. real number. Ratio of field 14 over field 15
17. integer. 1 if result was verified or 0 if not verified.
18. String of form "{n,n,..}" which is list of the rules used by Rubi

High level overview of the CAS independent integration test build system

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May 11, 2021

Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 19, 20, 21, 24, 25, 26, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 47, 48, 49, 52, 53, 54, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 106, 107, 108, 109, 110, 111, 114, 115, 116, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 137, 138, 139, 142, 143, 144, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 164, 165, 166, 168, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 191, 192, 193, 196, 197, 198, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 219, 220, 221, 224, 225, 226, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 309 }

B grade: { 14, 42, 70, 71, 72, 73, 101, 132, 167, 169, 186, 214, 244, 245, 246, 276, 277, 278, 308, 310, 311, 312, 313, 314 }

C grade: { 15, 16, 17, 18, 43, 44, 45, 46, 102, 103, 104, 105, 133, 134, 135, 136, 162, 163, 170, 171, 187, 188, 189, 190, 215, 216, 217, 218 }

F grade: { 22, 23, 27, 28, 50, 51, 55, 56, 112, 113, 117, 118, 140, 141, 145, 146, 172, 194, 195, 199, 200, 222, 223, 227, 228, 229 }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 137, 138, 139, 142, 143, 144, 148, 149, 150, 151, 152, 153, 154, 155, 160, 161, 162, 163, 169, 170, 171, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 219, 220, 221, 224, 225, 226, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 311 }

B grade: { 14, 42, 71, 72, 106, 107, 108, 147, 156, 157, 158, 159, 164, 165, 166, 167, 168, 245, 277, 306, 307, 308 }

C grade: { 15, 16, 17, 18, 43, 44, 45, 46, 102, 103, 104, 105, 133, 134, 135, 136, 187, 188, 189, 190, 215, 216, 217, 218 }

F grade: { 140, 141, 145, 146, 172, 222, 223, 227, 228, 229, 276, 309, 310, 312, 313, 314 }

2.1.3 Maple

A grade: { 19, 20, 21, 24, 25, 26, 47, 48, 49, 52, 53, 54, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 106, 107, 108, 109, 110, 111, 114, 115, 116, 137, 138, 139, 142, 143, 144, 191, 192, 193, 194, 196, 197, 198, 219, 220, 221, 224, 225, 226, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292 }

B grade: { 61, 88, 89, 90, 91, 92, 93, 94, 95, 96, 101, 102, 103, 104, 105, 119, 120, 121, 122, 123, 124, 125, 126, 127, 133, 134, 135, 136, 173, 174, 175, 176, 177, 178, 179, 180, 181, 186, 187, 188, 189, 190, 199, 201, 202, 203, 204, 205, 206, 207, 208, 209, 215, 216, 217, 218, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 244, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 297 }

C grade: { 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 160, 161, 162, 163, 168, 169, 170, 171, 293, 294, 295, 296, 298, 299, 300, 301, 302, 303, 304, 305 }

F grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 22, 23, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 50, 51, 55, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 97, 98, 99, 100, 112, 113, 117, 118, 128, 129, 130, 131, 132, 140, 141, 145, 146, 159, 164, 165, 166, 167, 172, 182, 183, 184, 185, 195, 200, 210, 211, 212, 213, 214, 222, 223, 227, 228, 229, 240, 241, 242, 243, 245, 246, 247, 248, 272, 273, 274, 275, 276, 277, 278, 279, 280, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.4 Maxima

A grade: { 4, 7, 19, 20, 21, 24, 25, 26, 32, 34, 35, 47, 48, 49, 52, 53, 54, 57, 58, 59, 60, 61, 63, 64, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 91, 94, 109, 110, 111, 114, 115, 116, 137, 138, 139, 142, 143, 144, 150, 152, 153, 176, 179, 191, 192, 193, 196, 197, 198, 206, 219, 220, 221, 224, 225, 226, 230, 231, 232, 233, 234, 236, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 266, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 295, 296, 297, 299 }

B grade: { 1, 2, 3, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 29, 30, 31, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 65, 66, 67, 68, 69, 88, 89, 90, 93, 95, 96, 97, 98, 99, 100, 102, 103, 104, 105, 106, 107, 108, 119, 120, 121, 122, 124, 125, 126, 127, 128, 129, 130, 131, 133, 134, 135, 136, 147, 148, 149, 154, 155, 156, 157, 158, 160, 161, 162, 163, 168, 169, 170, 171, 173, 174, 175, 178, 180, 181, 182, 183, 184, 185, 187, 188, 189, 190, 201, 202, 203, 204, 207, 208, 209, 210, 211, 212, 213, 215, 216, 217, 218, 237, 238, 239, 240, 241, 242, 262, 263, 264, 265, 268, 269, 270, 271, 272, 273, 274, 294, 300, 301, 302, 303, 304 }

C grade: { }

F grade: { 5, 14, 22, 23, 27, 28, 33, 42, 50, 51, 55, 56, 62, 70, 71, 72, 73, 74, 75, 92, 101, 112, 113, 117, 118, 123, 132, 140, 141, 145, 146, 151, 159, 164, 165, 166, 167, 172, 177, 186, 194, 195, 199, 200, 205, 214, 222, 223, 227, 228, 229, 235, 243, 244, 245, 246, 247, 248, 267, 275, 276, 277, 278, 279, 280, 298, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.5 FriCAS

A grade: { 4, 6, 7, 15, 19, 20, 21, 22, 23, 24, 25, 26, 27, 34, 35, 43, 47, 48, 49, 50, 51, 52, 53, 54, 55, 60, 61, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 91, 93, 94, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 122, 124, 125, 133, 134, 135, 136, 137, 138, 139, 142, 143, 144, 152, 172, 176, 178, 179, 187, 188, 189, 191, 192, 193, 194, 195, 196, 197, 198, 204, 206, 207, 215, 216, 217, 219, 220, 221, 224, 225, 226, 229, 230, 232, 233, 234, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 265, 266, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 296, 297 }

B grade: { 1, 2, 3, 8, 9, 16, 17, 18, 28, 29, 30, 31, 32, 36, 37, 44, 45, 46, 56, 57, 58, 59, 63, 64, 88, 89, 90, 95, 96, 118, 119, 120, 121, 126, 127, 147, 148, 149, 150, 153, 154, 155, 160, 161, 162, 163, 168, 169, 170, 171, 173, 174, 175, 180, 181, 190, 199, 200, 201, 202, 203, 208, 209, 218, 231, 236, 237, 263, 264, 268, 269, 293, 294, 295, 299, 300 }

C grade: { }

F grade: { 5, 10, 11, 12, 13, 14, 33, 38, 39, 40, 41, 42, 62, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 92, 97, 98, 99, 100, 101, 123, 128, 129, 130, 131, 132, 140, 141, 145, 146, 151, 156, 157, 158, 159, 164, 165, 166, 167, 177, 182, 183, 184, 185, 186, 205, 210, 211, 212, 213, 214, 222, 223, 227, 228, 235, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 267, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 298, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.6 Sympy

A grade: { 3, 4, 19, 20, 21, 24, 25, 31, 32, 47, 48, 49, 52, 53, 59, 60, 61, 76, 77, 78, 79, 82, 83, 84, 109, 110, 111, 114, 115, 116, 137, 138, 139, 142, 143, 144, 191, 192, 193, 197, 198, 219, 220, 221, 224, 225, 226, 234, 249, 250, 251, 252, 253, 254, 256, 257, 258, 281, 282, 283, 284, 285, 287, 288, 289 }

B grade: { 88, 89, 90, 91, 93, 94, 95, 96, 102, 103, 104, 119, 120, 121, 122, 124, 125, 126, 127, 133, 134, 135, 173, 174, 175, 176, 178, 179, 180, 181, 187, 188, 189, 201, 202, 203, 204, 206, 207, 208, 209, 215, 216, 217, 230, 231, 232, 233, 262, 263, 264, 265, 266 }

C grade: { }

F grade: { 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 22, 23, 26, 27, 28, 29, 30, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 50, 51, 54, 55, 56, 57, 58, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 80, 81, 85, 86, 87, 92, 97, 98, 99, 100, 101, 105, 106, 107, 108, 112, 113, 117, 118, 123, 128, 129, 130, 131, 132, 136, 140, 141, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 177, 182, 183, 184, 185, 186, 190, 194, 195, 196, 199, 200, 205, 210, 211, 212, 213, 214, 218, 222, 223, 227, 228, 229, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 255, 259, 260, 261, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 286, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.7 Giac

A grade: { 6, 7, 15, 16, 17, 18, 24, 25, 26, 34, 35, 43, 44, 45, 52, 53, 54, 55, 56, 82, 83, 84, 85, 86, 87, 93, 94, 102, 103, 104, 105, 116, 122, 125, 136, 137, 138, 139, 142, 143, 144, 150, 152, 153, 178, 179, 187, 188, 189, 198, 199, 204, 206, 207, 218, 219, 220, 221, 224, 225, 226, 258, 259, 260, 261, 264, 265, 266, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 296, 297, 299 }

B grade: { 1, 2, 3, 4, 8, 9, 29, 30, 31, 32, 36, 37, 46, 57, 58, 59, 60, 61, 63, 64, 65, 88, 89, 90, 91, 95, 96, 107, 108, 119, 120, 121, 124, 126, 127, 133, 147, 148, 149, 154, 155, 173, 174, 175, 176, 180, 181, 190, 200, 201, 202, 203, 208, 209, 215, 231, 232, 233, 234, 236, 237, 249, 263, 269, 270, 295, 300, 301, 302 }

C grade: { }

F grade: { 5, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 27, 28, 33, 38, 39, 40, 41, 42, 47, 48, 49, 50, 51, 62, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 92, 97, 98, 99, 100, 101, 106, 109, 110, 111, 112, 113, 114, 115, 117, 118, 123, 128, 129, 130, 131, 132, 134, 135, 140, 141, 145, 146, 151, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 177, 182, 183, 184, 185, 186, 191, 192, 193, 194, 195, 196, 197, 205, 210, 211, 212, 213, 214, 216, 217, 222, 223, 227, 228, 229, 230, 235, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 250, 251, 252, 253, 254, 255, 256, 257, 262, 267, 268, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 293, 294, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.8 Mupad

A grade: { 19, 20, 21, 24, 25, 26, 47, 48, 49, 52, 53, 54, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 109, 110, 111, 114, 115, 116, 137, 138, 139, 142, 143, 144, 191, 192, 193, 196, 197, 198, 219, 220, 221, 224, 225, 226, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292 }

B grade: { 1, 2, 3, 4, 6, 7, 8, 9, 15, 16, 17, 18, 29, 30, 31, 32, 34, 35, 36, 37, 43, 44, 45, 46, 57, 58, 59, 60, 61, 63, 64, 65, 66, 88, 89, 90, 91, 93, 94, 95, 96, 102, 103, 104, 105, 106, 107, 108, 119, 120, 121, 122, 124, 125, 126, 127, 133, 134, 135, 136, 147, 148, 149, 150, 152, 153, 154, 155, 160, 161, 162, 163, 168, 169, 170, 171, 173, 174, 175, 176, 178, 179, 180, 181, 187, 188, 189, 190, 201, 202, 203, 204, 206, 207, 208, 209, 215, 216, 217, 218, 230, 231, 232, 233, 234, 236, 237, 238, 239, 249, 262, 263, 264, 265, 266, 268, 269, 270, 271, 293, 294, 295, 296, 297, 299, 300, 301, 302 }

C grade: { }

F grade: { 5, 10, 11, 12, 13, 14, 22, 23, 27, 28, 33, 38, 39, 40, 41, 42, 50, 51, 55, 56, 62, 67, 68, 69, 70, 71, 72, 73, 74, 75, 92, 97, 98, 99, 100, 101, 112, 113, 117, 118, 123, 128, 129, 130, 131, 132, 140, 141, 145, 146, 151, 156, 157, 158, 159, 164, 165, 166, 167, 172, 177, 182, 183, 184, 185, 186, 194, 195, 199, 200, 205, 210, 211, 212, 213, 214, 222, 223, 227, 228, 229, 235, 240, 241, 242, 243, 244, 245, 246, 247, 248, 267, 272, 273, 274, 275, 276, 277, 278, 279, 280, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	146	0	676	569	0	4392	1046
normalized size	1	1.00	0.78	0.00	3.60	3.03	0.00	23.36	5.56
time (sec)	N/A	0.143	0.119	0.333	1.473	1.141	0.000	6.201	4.548

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	124	0	479	426	0	2986	588
normalized size	1	1.00	0.79	0.00	3.07	2.73	0.00	19.14	3.77
time (sec)	N/A	0.106	0.108	0.265	1.408	1.128	0.000	4.412	4.399

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	103	0	309	296	673	1836	303
normalized size	1	1.00	0.83	0.00	2.49	2.39	5.43	14.81	2.44
time (sec)	N/A	0.090	0.058	0.267	1.386	0.770	60.494	2.292	4.284

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	73	0	156	160	398	864	134
normalized size	1	1.00	0.85	0.00	1.81	1.86	4.63	10.05	1.56
time (sec)	N/A	0.061	0.038	0.175	1.347	0.927	40.673	1.241	4.073

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	126	101	0	0	0	0	0	-1
normalized size	1	1.50	1.20	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.209	0.053	0.365	0.000	0.839	0.000	0.000	0.000

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	108	115	0	137	103	0	85	112
normalized size	1	1.61	1.72	0.00	2.04	1.54	0.00	1.27	1.67
time (sec)	N/A	0.090	0.061	0.286	1.191	0.979	0.000	2.914	5.655

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	114	0	259	265	0	220	222
normalized size	1	1.00	0.75	0.00	1.72	1.75	0.00	1.46	1.47
time (sec)	N/A	0.123	0.152	0.281	1.363	0.922	0.000	4.801	4.522

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	145	0	432	482	0	375	349
normalized size	1	1.00	0.79	0.00	2.36	2.63	0.00	2.05	1.91
time (sec)	N/A	0.152	0.174	0.288	1.348	0.943	0.000	5.218	4.845

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	162	0	651	733	0	533	603
normalized size	1	1.00	0.75	0.00	3.03	3.41	0.00	2.48	2.80
time (sec)	N/A	0.189	0.223	0.280	1.600	0.714	0.000	8.372	5.121

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	396	602	535	0	2945	0	0	0	-1
normalized size	1	1.52	1.35	0.00	7.44	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.871	0.515	0.273	8.285	0.899	0.000	0.000	0.000

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	335	512	411	0	2175	0	0	0	-1
normalized size	1	1.53	1.23	0.00	6.49	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.707	0.349	0.286	8.015	0.810	0.000	0.000	0.000

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	274	420	303	0	1501	0	0	0	-1
normalized size	1	1.53	1.11	0.00	5.48	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.583	0.233	0.275	11.466	0.800	0.000	0.000	0.000

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	309	215	0	828	0	0	0	-1
normalized size	1	1.58	1.10	0.00	4.22	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.443	0.195	0.115	7.481	0.937	0.000	0.000	0.000

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	789	537	0	0	0	0	0	-1
normalized size	1	5.72	3.89	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	3.573	0.427	0.286	0.000	0.678	0.000	0.000	0.000

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	512	330	0	430	258	0	163	238
normalized size	1	3.76	2.43	0.00	3.16	1.90	0.00	1.20	1.75
time (sec)	N/A	0.840	0.575	0.271	1.473	0.830	0.000	7.357	5.590

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	288	626	463	0	861	651	0	458	506
normalized size	1	2.17	1.61	0.00	2.99	2.26	0.00	1.59	1.76
time (sec)	N/A	0.923	0.494	0.284	1.740	0.861	0.000	10.434	6.171

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	448	736	609	0	1432	1164	0	810	1038
normalized size	1	1.64	1.36	0.00	3.20	2.60	0.00	1.81	2.32
time (sec)	N/A	1.087	0.704	0.281	2.344	0.871	0.000	13.074	7.693

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	615	826	776	0	2136	1762	0	1166	1769
normalized size	1	1.34	1.26	0.00	3.47	2.87	0.00	1.90	2.88
time (sec)	N/A	1.314	1.025	0.279	2.978	1.077	0.000	17.895	9.221

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.233	0.771	0.263	0.000	0.881	0.000	0.000	0.000

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.115	0.297	0.154	0.000	0.917	0.000	0.000	0.000

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	0.150	0.369	0.000	0.859	0.000	0.000	0.000

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	0	94	0	0	62	0	0	-1
normalized size	1	0.00	1.00	0.00	0.00	0.66	0.00	0.00	-0.01
time (sec)	N/A	0.099	0.166	0.290	0.000	0.905	0.000	0.000	0.000

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	197	0	172	0	0	149	0	0	-1
normalized size	1	0.00	0.87	0.00	0.00	0.76	0.00	0.00	-0.01
time (sec)	N/A	0.082	0.328	0.286	0.000	0.953	0.000	0.000	0.000

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.238	1.050	0.261	0.000	0.763	0.000	0.000	0.000

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.126	0.987	0.068	0.000	0.889	0.000	0.000	0.000

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.091	0.557	0.281	0.000	0.625	0.000	0.000	0.000

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	0	146	0	0	274	0	0	-1
normalized size	1	0.00	0.95	0.00	0.00	1.79	0.00	0.00	-0.01
time (sec)	N/A	0.105	0.186	0.283	0.000	0.882	0.000	0.000	0.000

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	B	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	314	0	254	0	0	755	0	0	-1
normalized size	1	0.00	0.81	0.00	0.00	2.40	0.00	0.00	-0.00
time (sec)	N/A	0.093	0.616	0.286	0.000	0.930	0.000	0.000	0.000

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	146	0	676	572	0	1862	1045
normalized size	1	1.00	0.78	0.00	3.60	3.04	0.00	9.90	5.56
time (sec)	N/A	0.128	0.101	0.297	1.378	1.037	0.000	5.994	4.484

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	124	0	479	429	0	1390	588
normalized size	1	1.00	0.79	0.00	3.07	2.75	0.00	8.91	3.77
time (sec)	N/A	0.102	0.093	0.274	1.368	1.025	0.000	4.452	4.367

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	101	0	309	297	779	980	303
normalized size	1	1.00	0.81	0.00	2.49	2.40	6.28	7.90	2.44
time (sec)	N/A	0.081	0.061	0.272	1.288	1.038	60.458	3.154	4.307

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	74	0	156	162	444	572	134
normalized size	1	1.00	0.86	0.00	1.81	1.88	5.16	6.65	1.56
time (sec)	N/A	0.060	0.039	0.176	1.136	0.698	40.678	1.267	4.098

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	128	101	0	0	0	0	0	-1
normalized size	1	1.60	1.26	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.201	0.044	0.372	0.000	0.993	0.000	0.000	0.000

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	107	114	0	136	105	0	89	113
normalized size	1	1.05	1.12	0.00	1.33	1.03	0.00	0.87	1.11
time (sec)	N/A	0.087	0.059	0.292	1.133	0.843	0.000	3.766	4.017

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	115	0	259	266	0	203	221
normalized size	1	1.00	0.76	0.00	1.72	1.76	0.00	1.34	1.46
time (sec)	N/A	0.114	0.151	0.285	1.355	0.969	0.000	6.453	4.551

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	146	0	433	483	0	399	349
normalized size	1	1.00	0.80	0.00	2.37	2.64	0.00	2.18	1.91
time (sec)	N/A	0.143	0.170	0.279	1.365	0.931	0.000	7.700	4.723

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	162	0	652	735	0	676	603
normalized size	1	1.00	0.75	0.00	3.03	3.42	0.00	3.14	2.80
time (sec)	N/A	0.176	0.231	0.298	1.058	1.086	0.000	11.422	4.985

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	544	634	533	0	2880	0	0	0	-1
normalized size	1	1.17	0.98	0.00	5.29	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.880	0.503	0.277	4.783	0.855	0.000	0.000	0.000

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	454	544	409	0	2129	0	0	0	-1
normalized size	1	1.20	0.90	0.00	4.69	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.684	0.335	0.272	4.846	1.038	0.000	0.000	0.000

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	361	454	303	0	1473	0	0	0	-1
normalized size	1	1.26	0.84	0.00	4.08	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.567	0.239	0.265	5.751	0.773	0.000	0.000	0.000

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	220	307	216	0	825	0	0	0	-1
normalized size	1	1.40	0.98	0.00	3.75	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.423	0.205	0.110	4.367	0.924	0.000	0.000	0.000

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	782	537	0	0	0	0	0	-1
normalized size	1	5.71	3.92	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	3.302	0.407	0.300	0.000	0.957	0.000	0.000	0.000

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	514	331	0	428	263	0	164	237
normalized size	1	3.15	2.03	0.00	2.63	1.61	0.00	1.01	1.45
time (sec)	N/A	0.774	0.431	0.282	0.861	0.912	0.000	7.263	5.649

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	626	464	0	861	654	0	387	505
normalized size	1	1.97	1.46	0.00	2.72	2.06	0.00	1.22	1.59
time (sec)	N/A	0.915	0.444	0.280	1.226	1.084	0.000	9.303	5.467

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	429	736	609	0	1435	1167	0	746	1040
normalized size	1	1.72	1.42	0.00	3.34	2.72	0.00	1.74	2.42
time (sec)	N/A	1.098	0.673	0.285	1.293	0.852	0.000	13.815	7.162

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	F	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	536	826	776	0	2138	1768	0	1225	1765
normalized size	1	1.54	1.45	0.00	3.99	3.30	0.00	2.29	3.29
time (sec)	N/A	1.295	0.929	0.285	2.109	1.157	0.000	19.414	9.081

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.214	0.439	0.265	0.000	0.875	0.000	0.000	0.000

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.115	0.298	0.152	0.000	1.315	0.000	0.000	0.000

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.083	0.178	0.385	0.000	0.803	0.000	0.000	0.000

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	0	96	0	0	62	0	0	-1
normalized size	1	0.00	1.00	0.00	0.00	0.65	0.00	0.00	-0.01
time (sec)	N/A	0.100	0.123	0.283	0.000	0.897	0.000	0.000	0.000

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	0	174	0	0	147	0	0	-1
normalized size	1	0.00	0.87	0.00	0.00	0.74	0.00	0.00	-0.01
time (sec)	N/A	0.083	0.285	0.284	0.000	0.904	0.000	0.000	0.000

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.233	0.996	0.264	0.000	1.031	0.000	0.000	0.000

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.124	1.004	0.063	0.000	0.898	0.000	0.000	0.000

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.090	0.559	0.304	0.000	0.903	0.000	0.000	0.000

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F(-1)	A	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	0	180	0	0	291	0	140	-1
normalized size	1	0.00	1.17	0.00	0.00	1.89	0.00	0.91	-0.01
time (sec)	N/A	0.104	0.171	0.289	0.000	0.805	0.000	1.160	0.000

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	B	F(-1)	A	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	256	0	288	0	0	770	0	312	-1
normalized size	1	0.00	1.12	0.00	0.00	3.01	0.00	1.22	-0.00
time (sec)	N/A	0.094	0.544	0.288	0.000	0.899	0.000	2.108	0.000

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	364	348	285	0	631	736	0	11806	1433
normalized size	1	0.96	0.78	0.00	1.73	2.02	0.00	32.43	3.94
time (sec)	N/A	0.603	0.630	0.342	0.908	2.394	0.000	15.160	4.680

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	219	0	443	521	0	6660	766
normalized size	1	1.00	0.93	0.00	1.89	2.22	0.00	28.34	3.26
time (sec)	N/A	0.359	0.283	0.262	0.927	1.607	0.000	9.224	4.742

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	146	0	282	334	1027	3346	371
normalized size	1	1.00	0.93	0.00	1.80	2.13	6.54	21.31	2.36
time (sec)	N/A	0.180	0.146	0.269	0.888	0.961	70.520	5.580	4.179

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	120	0	150	179	551	1189	153
normalized size	1	1.00	1.04	0.00	1.30	1.56	4.79	10.34	1.33
time (sec)	N/A	0.105	0.127	0.178	0.760	1.166	44.182	2.374	4.257

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	122	52	63	158	237	52
normalized size	1	1.00	1.00	2.18	0.93	1.12	2.82	4.23	0.93
time (sec)	N/A	0.033	0.010	0.050	0.626	0.915	5.414	0.942	4.005

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	122	0	0	0	0	0	-1
normalized size	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.226	0.060	0.391	0.000	1.002	0.000	0.000	0.000

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	119	109	0	142	294	0	455	140
normalized size	1	1.31	1.20	0.00	1.56	3.23	0.00	5.00	1.54
time (sec)	N/A	0.125	0.147	0.288	0.814	11.245	0.000	4.104	4.640

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	173	0	355	1175	0	2952	430
normalized size	1	1.00	0.91	0.00	1.87	6.18	0.00	15.54	2.26
time (sec)	N/A	0.236	0.544	0.280	0.997	159.269	0.000	6.805	6.199

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F(-1)	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	283	283	264	0	852	0	0	9570	1182
normalized size	1	1.00	0.93	0.00	3.01	0.00	0.00	33.82	4.18
time (sec)	N/A	0.458	0.893	0.285	1.409	0.000	0.000	9.250	9.225

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F(-1)	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	388	388	359	0	1761	0	0	0	2569
normalized size	1	1.00	0.93	0.00	4.54	0.00	0.00	0.00	6.62
time (sec)	N/A	0.713	1.070	0.292	1.798	0.000	0.000	0.000	13.771

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	923	1060	757	0	2651	0	0	0	-1
normalized size	1	1.15	0.82	0.00	2.87	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.835	1.040	0.277	5.353	1.334	0.000	0.000	0.000

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	565	699	506	0	1659	0	0	0	-1
normalized size	1	1.24	0.90	0.00	2.94	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.150	0.558	0.281	4.830	1.154	0.000	0.000	0.000

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	290	481	362	0	899	0	0	0	-1
normalized size	1	1.66	1.25	0.00	3.10	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.831	0.313	0.112	5.191	1.368	0.000	0.000	0.000

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	275	226	0	0	0	0	0	-1
normalized size	1	2.04	1.67	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.617	0.173	0.146	0.000	1.097	0.000	0.000	0.000

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	297	2233	1441	0	0	0	0	0	-1
normalized size	1	7.52	4.85	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	5.184	0.458	0.309	0.000	1.230	0.000	0.000	0.000

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	657	418	0	0	0	0	0	-1
normalized size	1	3.19	2.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.134	0.521	0.286	0.000	1.413	0.000	0.000	0.000

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	941	615	0	0	0	0	0	-1
normalized size	1	2.42	1.58	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.561	1.652	0.287	0.000	0.798	0.000	0.000	0.000

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	747	1427	918	0	0	0	0	0	-1
normalized size	1	1.91	1.23	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.500	3.713	0.278	0.000	1.187	0.000	0.000	0.000

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1208	1968	1476	0	0	0	0	0	-1
normalized size	1	1.63	1.22	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.545	7.322	0.290	0.000	1.093	0.000	0.000	0.000

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.189	0.428	0.261	0.000	0.742	0.000	0.000	0.000

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.102	0.289	0.148	0.000	0.859	0.000	0.000	0.000

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.015	0.016	0.121	0.000	1.068	0.000	0.000	0.000

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.071	0.980	0.385	0.000	0.811	0.000	0.000	0.000

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.075	1.104	0.287	0.000	0.900	0.000	0.000	0.000

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.072	11.860	0.293	0.000	2.879	0.000	0.000	0.000

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.207	0.942	0.268	0.000	0.810	0.000	0.000	0.000

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	0.741	0.059	0.000	0.896	0.000	0.000	0.000

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.015	0.665	0.141	0.000	0.875	0.000	0.000	0.000

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.078	1.712	0.305	0.000	0.858	0.000	0.000	0.000

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	3.823	0.285	0.000	1.216	0.000	0.000	0.000

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.080	35.462	0.288	0.000	0.827	0.000	0.000	0.000

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	142	8417	623	431	969	5428	1009
normalized size	1	1.00	0.79	46.76	3.46	2.39	5.38	30.16	5.61
time (sec)	N/A	0.124	0.105	0.185	1.317	1.060	6.400	2.558	4.780

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	120	5556	439	318	706	3795	566
normalized size	1	1.00	0.81	37.29	2.95	2.13	4.74	25.47	3.80
time (sec)	N/A	0.096	0.097	0.164	1.330	1.014	4.298	1.807	4.645

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	99	3283	280	222	491	2450	290
normalized size	1	1.00	0.84	27.82	2.37	1.88	4.16	20.76	2.46
time (sec)	N/A	0.079	0.055	0.149	1.238	0.567	2.920	1.290	4.480

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	69	1544	144	125	253	1319	126
normalized size	1	1.00	0.85	19.06	1.78	1.54	3.12	16.28	1.56
time (sec)	N/A	0.053	0.035	0.134	1.459	0.787	1.951	0.966	4.303

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	120	95	602	0	0	0	0	-1
normalized size	1	1.50	1.19	7.52	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.217	0.045	0.086	0.000	0.982	0.000	0.000	0.000

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	102	105	373	132	83	233	110	104
normalized size	1	1.62	1.67	5.92	2.10	1.32	3.70	1.75	1.65
time (sec)	N/A	0.079	0.058	0.046	1.089	1.366	1.579	1.300	5.020

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	110	777	255	217	422	237	209
normalized size	1	1.00	0.76	5.40	1.77	1.51	2.93	1.65	1.45
time (sec)	N/A	0.100	0.129	0.049	1.256	0.611	2.710	1.686	5.039

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	141	1191	428	406	656	382	339
normalized size	1	1.00	0.81	6.81	2.45	2.32	3.75	2.18	1.94
time (sec)	N/A	0.130	0.155	0.049	1.360	0.607	4.246	2.131	5.584

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	158	1607	647	629	944	528	577
normalized size	1	1.00	0.77	7.80	3.14	3.05	4.58	2.56	2.80
time (sec)	N/A	0.157	0.209	0.049	1.540	3.016	5.926	2.043	6.166

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	365	557	511	0	2389	0	0	0	-1
normalized size	1	1.53	1.40	0.00	6.55	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.855	0.486	2.566	2.376	1.846	0.000	0.000	0.000

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	474	391	0	1732	0	0	0	-1
normalized size	1	1.53	1.27	0.00	5.61	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.646	0.373	2.177	2.369	1.895	0.000	0.000	0.000

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	389	287	0	1165	0	0	0	-1
normalized size	1	1.54	1.13	0.00	4.60	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.553	0.287	1.901	2.333	0.958	0.000	0.000	0.000

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	285	203	0	611	0	0	0	-1
normalized size	1	1.58	1.13	0.00	3.39	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.456	0.173	1.622	2.210	0.877	0.000	0.000	0.000

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	728	250	1186	0	0	0	0	-1
normalized size	1	5.69	1.95	9.27	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	3.416	0.613	0.065	0.000	1.639	0.000	0.000	0.000

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	470	314	828	416	150	434	176	222
normalized size	1	3.73	2.49	6.57	3.30	1.19	3.44	1.40	1.76
time (sec)	N/A	0.772	0.454	0.046	1.405	1.096	3.591	2.076	5.260

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	577	443	1715	848	367	894	424	507
normalized size	1	2.15	1.65	6.40	3.16	1.37	3.34	1.58	1.89
time (sec)	N/A	0.910	0.465	0.048	1.815	0.573	6.550	1.753	5.851

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	418	680	585	2624	1419	672	1544	709	1064
normalized size	1	1.63	1.40	6.28	3.39	1.61	3.69	1.70	2.55
time (sec)	N/A	1.059	0.691	0.053	2.452	0.691	34.300	1.888	7.405

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	575	763	748	3538	2123	1035	0	995	1881
normalized size	1	1.33	1.30	6.15	3.69	1.80	0.00	1.73	3.27
time (sec)	N/A	1.227	0.967	0.051	3.410	1.503	0.000	2.232	10.303

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	29	114	30	158	30	0	0	25
normalized size	1	1.04	4.07	1.07	5.64	1.07	0.00	0.00	0.89
time (sec)	N/A	0.022	0.050	0.047	1.171	0.678	0.000	0.000	4.248

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	15	15	140	15	61	22	0	320	15
normalized size	1	1.00	9.33	1.00	4.07	1.47	0.00	21.33	1.00
time (sec)	N/A	0.014	0.015	0.041	1.211	0.662	0.000	39.245	4.027

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	13	13	133	17	59	22	0	322	13
normalized size	1	1.00	10.23	1.31	4.54	1.69	0.00	24.77	1.00
time (sec)	N/A	0.013	0.015	0.043	1.304	0.812	0.000	30.471	4.231

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.200	0.616	1.148	0.000	0.789	0.000	0.000	0.000

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.101	0.250	1.015	0.000	1.444	0.000	0.000	0.000

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.072	0.228	1.180	0.000	1.639	0.000	0.000	0.000

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	52	0	0	47	0	0	-1
normalized size	1	0.00	1.04	0.00	0.00	0.94	0.00	0.00	-0.02
time (sec)	N/A	0.090	0.104	1.260	0.000	1.353	0.000	0.000	0.000

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	0	89	0	0	130	0	0	-1
normalized size	1	0.00	0.83	0.00	0.00	1.21	0.00	0.00	-0.01
time (sec)	N/A	0.073	0.171	1.321	0.000	0.657	0.000	0.000	0.000

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.206	1.350	1.090	0.000	0.721	0.000	0.000	0.000

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.107	0.930	1.085	0.000	0.950	0.000	0.000	0.000

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	0.635	0.995	0.000	0.597	0.000	0.000	0.000

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	0	87	0	0	199	0	0	-1
normalized size	1	0.00	0.84	0.00	0.00	1.93	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.178	1.338	0.000	0.744	0.000	0.000	0.000

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	B	F(-1)	F	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	0	136	0	0	570	0	0	-1
normalized size	1	0.00	0.64	0.00	0.00	2.69	0.00	0.00	-0.00
time (sec)	N/A	0.084	0.654	1.506	0.000	0.616	0.000	0.000	0.000

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	144	1606	885	454	998	496	1025
normalized size	1	1.00	0.79	8.82	4.86	2.49	5.48	2.73	5.63
time (sec)	N/A	0.110	0.091	0.191	1.445	0.776	6.744	72.969	4.990

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	122	1249	647	341	707	361	567
normalized size	1	1.00	0.81	8.27	4.28	2.26	4.68	2.39	3.75
time (sec)	N/A	0.097	0.095	0.085	1.602	1.093	4.888	17.615	4.740

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	98	915	437	243	517	252	296
normalized size	1	1.00	0.82	7.62	3.64	2.02	4.31	2.10	2.47
time (sec)	N/A	0.074	0.065	0.078	1.414	0.754	3.513	3.434	4.589

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	72	560	250	148	250	131	120
normalized size	1	1.00	0.92	7.18	3.21	1.90	3.21	1.68	1.54
time (sec)	N/A	0.057	0.046	0.074	1.324	0.585	2.019	0.843	4.389

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	122	88	552	0	0	0	0	-1
normalized size	1	1.47	1.06	6.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.292	0.048	0.134	0.000	2.740	0.000	0.000	0.000

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	105	111	157	187	110	255	188	108
normalized size	1	1.62	1.71	2.42	2.88	1.69	3.92	2.89	1.66
time (sec)	N/A	0.077	0.063	0.076	1.222	0.676	1.723	0.455	5.251

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	109	355	307	238	418	264	206
normalized size	1	1.00	0.79	2.57	2.22	1.72	3.03	1.91	1.49
time (sec)	N/A	0.093	0.136	0.115	1.237	0.605	2.741	0.300	5.140

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	140	579	480	430	677	473	341
normalized size	1	1.00	0.79	3.27	2.71	2.43	3.82	2.67	1.93
time (sec)	N/A	0.115	0.171	0.159	1.387	0.586	4.244	0.326	5.800

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	162	833	699	654	947	419	579
normalized size	1	1.00	0.78	4.00	3.36	3.14	4.55	2.01	2.78
time (sec)	N/A	0.144	0.222	0.218	1.618	0.951	5.814	0.768	6.511

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	377	569	523	0	2650	0	0	0	-1
normalized size	1	1.51	1.39	0.00	7.03	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.872	0.462	1.368	3.088	0.699	0.000	0.000	0.000

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	319	470	402	0	1948	0	0	0	-1
normalized size	1	1.47	1.26	0.00	6.11	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.760	0.318	1.204	2.984	0.673	0.000	0.000	0.000

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	397	298	0	1326	0	0	0	-1
normalized size	1	1.56	1.17	0.00	5.20	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.621	0.217	1.158	2.634	0.510	0.000	0.000	0.000

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	291	207	0	727	0	0	0	-1
normalized size	1	1.55	1.10	0.00	3.87	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.493	0.170	0.954	2.420	0.918	0.000	0.000	0.000

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	749	257	0	0	0	0	0	-1
normalized size	1	5.67	1.95	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	4.141	0.321	0.985	0.000	2.025	0.000	0.000	0.000

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	480	321	357	574	200	454	378	228
normalized size	1	3.69	2.47	2.75	4.42	1.54	3.49	2.91	1.75
time (sec)	N/A	0.888	0.429	0.097	1.595	0.759	3.660	1.736	5.971

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	272	579	451	815	1001	410	879	0	503
normalized size	1	2.13	1.66	3.00	3.68	1.51	3.23	0.00	1.85
time (sec)	N/A	1.046	0.443	0.154	1.937	0.661	6.236	0.000	5.887

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	429	692	598	1343	1575	719	1561	0	1069
normalized size	1	1.61	1.39	3.13	3.67	1.68	3.64	0.00	2.49
time (sec)	N/A	1.225	0.638	0.230	2.668	0.918	34.025	0.000	7.669

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	587	757	762	1943	2279	1084	0	874	1883
normalized size	1	1.29	1.30	3.31	3.88	1.85	0.00	1.49	3.21
time (sec)	N/A	1.394	0.936	0.343	3.443	1.027	0.000	3.181	10.546

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.197	0.162	0.796	0.000	0.570	0.000	0.000	0.000

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.101	0.116	0.632	0.000	0.920	0.000	0.000	0.000

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.073	0.071	0.822	0.000	0.744	0.000	0.000	0.000

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	94	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.087	0.075	0.875	0.000	0.913	0.000	0.000	0.000

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	152	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.081	0.959	0.000	0.823	0.000	0.000	0.000

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.215	0.467	0.764	0.000	0.732	0.000	0.000	0.000

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	0.345	0.754	0.000	0.835	0.000	0.000	0.000

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.081	0.144	0.737	0.000	0.819	0.000	0.000	0.000

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	150	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.094	0.179	1.046	0.000	1.435	0.000	0.000	0.000

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F(-1)	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	266	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.082	0.348	1.317	0.000	0.917	0.000	0.000	0.000

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	183	364	2374	671	563	0	497	936
normalized size	1	1.07	2.13	13.88	3.92	3.29	0.00	2.91	5.47
time (sec)	N/A	0.183	0.806	0.779	1.468	0.773	0.000	11.526	4.564

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	154	273	1840	467	417	0	355	520
normalized size	1	1.08	1.92	12.96	3.29	2.94	0.00	2.50	3.66
time (sec)	N/A	0.135	0.486	0.513	1.402	0.573	0.000	3.824	4.486

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	125	194	1325	294	282	0	235	262
normalized size	1	1.11	1.72	11.73	2.60	2.50	0.00	2.08	2.32
time (sec)	N/A	0.121	0.287	0.467	1.268	0.956	0.000	1.382	4.239

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	96	126	817	154	163	0	127	127
normalized size	1	1.14	1.50	9.73	1.83	1.94	0.00	1.51	1.51
time (sec)	N/A	0.091	0.149	0.427	1.233	1.112	0.000	0.584	4.283

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	87	129	523	0	0	0	0	-1
normalized size	1	1.10	1.63	6.62	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.268	0.098	1.244	0.000	0.990	0.000	0.000	0.000

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	72	89	823	116	107	0	108	97
normalized size	1	0.74	0.92	8.48	1.20	1.10	0.00	1.11	1.00
time (sec)	N/A	0.084	0.085	0.402	1.195	2.045	0.000	0.196	4.909

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	149	121	1379	230	296	0	239	192
normalized size	1	1.09	0.88	10.07	1.68	2.16	0.00	1.74	1.40
time (sec)	N/A	0.154	0.311	0.487	1.376	0.555	0.000	0.217	4.663

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	178	143	1976	400	540	0	448	317
normalized size	1	1.07	0.86	11.90	2.41	3.25	0.00	2.70	1.91
time (sec)	N/A	0.170	0.377	0.585	1.289	0.606	0.000	0.230	4.912

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	207	165	2583	618	820	0	710	555
normalized size	1	1.06	0.85	13.25	3.17	4.21	0.00	3.64	2.85
time (sec)	N/A	0.193	0.358	0.670	1.381	1.521	0.000	0.247	5.334

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	542	1709	26948	1871	0	0	0	-1
normalized size	1	1.68	5.31	83.69	5.81	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.772	1.799	3.550	7.070	1.035	0.000	0.000	0.000

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	263	427	1149	19969	1284	0	0	0	-1
normalized size	1	1.62	4.37	75.93	4.88	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.626	1.062	2.841	7.047	0.522	0.000	0.000	0.000

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	308	656	10210	779	0	0	0	-1
normalized size	1	1.58	3.36	52.36	3.99	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.486	0.731	2.093	6.912	0.571	0.000	0.000	0.000

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	227	269	0	0	0	0	0	-1
normalized size	1	1.73	2.05	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.504	0.190	2.572	0.000	0.777	0.000	0.000	0.000

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	189	236	10098	449	339	0	0	200
normalized size	1	1.47	1.83	78.28	3.48	2.63	0.00	0.00	1.55
time (sec)	N/A	0.182	0.372	2.253	1.531	0.842	0.000	0.000	5.269

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	274	411	332	17300	899	919	0	0	444
normalized size	1	1.50	1.21	63.14	3.28	3.35	0.00	0.00	1.62
time (sec)	N/A	0.423	0.523	3.360	1.848	0.774	0.000	0.000	5.316

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	427	730	432	25057	1500	1635	0	0	911
normalized size	1	1.71	1.01	58.68	3.51	3.83	0.00	0.00	2.13
time (sec)	N/A	1.212	0.726	4.703	2.435	1.158	0.000	0.000	6.842

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	587	843	1011	33370	2238	2458	0	0	1579
normalized size	1	1.44	1.72	56.85	3.81	4.19	0.00	0.00	2.69
time (sec)	N/A	1.408	0.954	5.845	2.996	0.837	0.000	0.000	9.607

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	809	1203	9054	0	0	0	0	0	-1
normalized size	1	1.49	11.19	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.404	10.008	8.023	0.000	0.845	0.000	0.000	0.000

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	614	915	5668	0	0	0	0	0	-1
normalized size	1	1.49	9.23	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.737	4.216	7.008	0.000	0.930	0.000	0.000	0.000

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	376	700	3813	0	0	0	0	0	-1
normalized size	1	1.86	10.14	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.183	3.088	10.047	0.000	0.815	0.000	0.000	0.000

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	424	2513	0	0	0	0	0	-1
normalized size	1	2.28	13.51	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.851	0.986	3.339	0.000	0.731	0.000	0.000	0.000

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	360	524	69354	1129	825	0	0	474
normalized size	1	1.96	2.85	376.92	6.14	4.48	0.00	0.00	2.58
time (sec)	N/A	0.315	0.788	20.955	2.161	0.921	0.000	0.000	6.060

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	390	811	693	120138	2246	2244	0	0	966
normalized size	1	2.08	1.78	308.05	5.76	5.75	0.00	0.00	2.48
time (sec)	N/A	0.804	1.184	32.817	2.762	0.731	0.000	0.000	8.988

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	611	1876	1003	175812	3630	4008	0	0	2069
normalized size	1	3.07	1.64	287.74	5.94	6.56	0.00	0.00	3.39
time (sec)	N/A	3.432	1.503	48.030	4.174	1.112	0.000	0.000	10.731

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	A	C	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	830	2173	1370	236754	5280	6057	0	0	4257
normalized size	1	2.62	1.65	285.25	6.36	7.30	0.00	0.00	5.13
time (sec)	N/A	4.675	2.218	58.078	5.793	1.617	0.000	0.000	11.290

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	A	F(-1)	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	96	0	0	0	0	62	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.65	0.00	0.00	-0.01
time (sec)	N/A	0.100	0.087	4.518	0.000	0.606	0.000	0.000	0.000

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	142	2930	619	433	969	5960	1008
normalized size	1	1.00	0.79	16.28	3.44	2.41	5.38	33.11	5.60
time (sec)	N/A	0.124	0.103	0.145	1.259	0.849	6.523	1.533	4.863

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	149	149	120	2191	436	320	706	4137	566
normalized size	1	1.00	0.81	14.70	2.93	2.15	4.74	27.77	3.80
time (sec)	N/A	0.101	0.081	0.138	1.305	1.119	4.345	1.192	4.692

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	99	1537	278	223	491	2640	290
normalized size	1	1.00	0.84	13.03	2.36	1.89	4.16	22.37	2.46
time (sec)	N/A	0.081	0.052	0.191	1.163	0.830	2.910	0.887	4.572

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	69	951	143	127	253	1395	126
normalized size	1	1.00	0.85	11.74	1.77	1.57	3.12	17.22	1.56
time (sec)	N/A	0.055	0.038	0.139	1.119	0.956	1.917	0.670	4.310

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	122	95	419	0	0	0	0	-1
normalized size	1	1.51	1.17	5.17	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.211	0.043	0.056	0.000	0.775	0.000	0.000	0.000

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	101	86	520	134	87	231	126	106
normalized size	1	1.58	1.34	8.12	2.09	1.36	3.61	1.97	1.66
time (sec)	N/A	0.077	0.054	0.046	1.071	1.729	1.539	0.902	5.006

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	128	753	255	221	422	254	208
normalized size	1	1.00	0.89	5.23	1.77	1.53	2.93	1.76	1.44
time (sec)	N/A	0.104	0.095	0.051	1.280	1.697	2.684	0.861	5.195

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	141	1012	428	412	656	382	339
normalized size	1	1.00	0.81	5.78	2.45	2.35	3.75	2.18	1.94
time (sec)	N/A	0.131	0.141	0.050	1.372	1.119	4.061	1.057	5.875

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	166	1306	647	637	944	511	578
normalized size	1	1.00	0.81	6.34	3.14	3.09	4.58	2.48	2.81
time (sec)	N/A	0.149	0.192	0.055	1.515	0.922	5.534	1.388	6.623

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	503	557	512	0	2395	0	0	0	-1
normalized size	1	1.11	1.02	0.00	4.76	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.818	0.506	2.199	2.528	0.627	0.000	0.000	0.000

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	420	474	392	0	1735	0	0	0	-1
normalized size	1	1.13	0.93	0.00	4.13	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.648	0.346	1.980	2.160	0.706	0.000	0.000	0.000

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	335	389	290	0	1172	0	0	0	-1
normalized size	1	1.16	0.87	0.00	3.50	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.556	0.238	1.814	2.086	1.020	0.000	0.000	0.000

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	284	203	0	619	0	0	0	-1
normalized size	1	1.41	1.00	0.00	3.06	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.418	0.180	1.526	1.969	0.660	0.000	0.000	0.000

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	719	251	906	0	0	0	0	-1
normalized size	1	5.62	1.96	7.08	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	4.423	0.286	0.057	0.000	0.689	0.000	0.000	0.000

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	470	314	1251	416	154	430	188	223
normalized size	1	3.07	2.05	8.18	2.72	1.01	2.81	1.23	1.46
time (sec)	N/A	0.762	0.476	0.050	1.254	0.670	3.749	1.555	6.379

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	296	578	444	1934	847	373	892	493	507
normalized size	1	1.95	1.50	6.53	2.86	1.26	3.01	1.67	1.71
time (sec)	N/A	0.910	0.437	0.051	1.517	0.817	6.554	2.193	6.002

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	399	680	585	2758	1420	680	1544	760	1064
normalized size	1	1.70	1.47	6.91	3.56	1.70	3.87	1.90	2.67
time (sec)	N/A	1.074	0.685	0.051	2.172	2.026	34.712	2.742	7.703

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	498	763	748	3717	2122	1045	0	1029	1880
normalized size	1	1.53	1.50	7.46	4.26	2.10	0.00	2.07	3.78
time (sec)	N/A	1.264	0.920	0.052	2.908	0.604	0.000	2.337	10.940

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.196	0.601	1.171	0.000	0.764	0.000	0.000	0.000

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.101	0.247	0.932	0.000	2.548	0.000	0.000	0.000

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.073	0.246	1.096	0.000	0.998	0.000	0.000	0.000

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	A	F	A	F	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	0	50	69	0	50	0	0	-1
normalized size	1	0.00	0.94	1.30	0.00	0.94	0.00	0.00	-0.02
time (sec)	N/A	0.086	0.068	0.533	0.000	0.916	0.000	0.000	0.000

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	A	F	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	0	89	0	0	129	0	0	-1
normalized size	1	0.00	0.82	0.00	0.00	1.18	0.00	0.00	-0.01
time (sec)	N/A	0.072	0.162	1.149	0.000	0.865	0.000	0.000	0.000

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.206	1.398	1.066	0.000	2.135	0.000	0.000	0.000

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.106	0.970	1.122	0.000	0.807	0.000	0.000	0.000

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.079	0.523	0.976	0.000	0.637	0.000	0.000	0.000

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	B	F	B	F	A	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	0	88	258	0	208	0	152	-1
normalized size	1	0.00	0.85	2.48	0.00	2.00	0.00	1.46	-0.01
time (sec)	N/A	0.089	0.119	0.452	0.000	0.571	0.000	1.341	0.000

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	A	F	F	B	F(-1)	B	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	0	135	0	0	584	0	317	-1
normalized size	1	0.00	0.85	0.00	0.00	3.67	0.00	1.99	-0.01
time (sec)	N/A	0.080	0.415	1.493	0.000	0.535	0.000	1.827	0.000

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	144	1030	882	457	998	493	1024
normalized size	1	1.00	0.79	5.66	4.85	2.51	5.48	2.71	5.63
time (sec)	N/A	0.118	0.101	0.132	1.397	0.705	6.699	77.997	4.789

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	122	788	645	343	707	364	567
normalized size	1	1.00	0.81	5.22	4.27	2.27	4.68	2.41	3.75
time (sec)	N/A	0.098	0.075	0.066	1.306	0.530	4.354	18.855	4.853

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	98	569	436	245	517	248	296
normalized size	1	1.00	0.82	4.74	3.63	2.04	4.31	2.07	2.47
time (sec)	N/A	0.078	0.051	0.066	1.511	0.604	3.125	3.510	4.646

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	72	340	250	149	250	128	120
normalized size	1	1.00	0.92	4.36	3.21	1.91	3.21	1.64	1.54
time (sec)	N/A	0.052	0.038	0.064	1.442	0.639	1.924	0.900	4.380

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	121	87	265	0	0	0	0	-1
normalized size	1	1.46	1.05	3.19	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.292	0.038	0.064	0.000	2.562	0.000	0.000	0.000

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	105	89	212	187	110	253	188	108
normalized size	1	1.03	0.87	2.08	1.83	1.08	2.48	1.84	1.06
time (sec)	N/A	0.076	0.052	0.054	1.078	0.492	1.641	0.400	5.943

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	128	300	306	240	418	259	206
normalized size	1	1.00	0.92	2.16	2.20	1.73	3.01	1.86	1.48
time (sec)	N/A	0.101	0.092	0.056	1.155	0.647	2.600	0.344	5.928

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	140	427	480	432	677	473	341
normalized size	1	1.00	0.79	2.41	2.71	2.44	3.82	2.67	1.93
time (sec)	N/A	0.121	0.104	0.055	1.223	0.800	4.056	0.328	6.733

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	162	587	699	658	947	416	579
normalized size	1	1.00	0.78	2.82	3.36	3.16	4.55	2.00	2.78
time (sec)	N/A	0.143	0.169	0.059	1.377	1.511	5.685	0.687	7.897

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	515	569	524	0	2660	0	0	0	-1
normalized size	1	1.10	1.02	0.00	5.17	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.864	0.468	1.359	2.597	0.710	0.000	0.000	0.000

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	422	469	402	0	1950	0	0	0	-1
normalized size	1	1.11	0.95	0.00	4.62	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.741	0.323	1.237	2.597	0.645	0.000	0.000	0.000

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	343	397	298	0	1333	0	0	0	-1
normalized size	1	1.16	0.87	0.00	3.89	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.625	0.225	1.146	1.699	2.203	0.000	0.000	0.000

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	291	195	0	730	0	0	0	-1
normalized size	1	1.38	0.92	0.00	3.46	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.504	0.172	0.925	2.086	0.543	0.000	0.000	0.000

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	740	257	0	0	0	0	0	-1
normalized size	1	5.61	1.95	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	4.080	0.335	1.000	0.000	1.434	0.000	0.000	0.000

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	480	322	452	573	200	450	374	227
normalized size	1	3.06	2.05	2.88	3.65	1.27	2.87	2.38	1.45
time (sec)	N/A	0.924	0.461	0.063	1.160	0.744	3.803	1.279	6.489

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	299	578	452	664	1001	413	877	0	504
normalized size	1	1.93	1.51	2.22	3.35	1.38	2.93	0.00	1.69
time (sec)	N/A	1.081	0.458	0.064	1.482	1.043	6.647	0.000	6.707

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	407	692	598	947	1576	721	1561	0	1069
normalized size	1	1.70	1.47	2.33	3.87	1.77	3.84	0.00	2.63
time (sec)	N/A	1.228	0.760	0.067	1.895	0.665	35.552	0.000	9.083

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	C	C	B	B	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	501	758	762	1285	2278	1088	0	868	1882
normalized size	1	1.51	1.52	2.56	4.55	2.17	0.00	1.73	3.76
time (sec)	N/A	1.429	0.873	0.073	2.508	0.818	0.000	2.225	12.108

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.202	0.159	0.798	0.000	0.702	0.000	0.000	0.000

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.101	0.118	0.653	0.000	0.742	0.000	0.000	0.000

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.073	0.073	0.829	0.000	0.618	0.000	0.000	0.000

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.087	0.078	0.872	0.000	0.649	0.000	0.000	0.000

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	151	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.082	0.978	0.000	1.925	0.000	0.000	0.000

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.212	0.469	0.763	0.000	0.766	0.000	0.000	0.000

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.110	0.348	0.759	0.000	0.527	0.000	0.000	0.000

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.082	0.146	0.757	0.000	0.811	0.000	0.000	0.000

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	147	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.093	0.186	1.048	0.000	0.725	0.000	0.000	0.000

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	F	F(-1)	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	206	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.085	0.354	1.322	0.000	0.712	0.000	0.000	0.000

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	F	F	F	F	A	F(-1)	F	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	96	0	0	0	0	62	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.65	0.00	0.00	-0.01
time (sec)	N/A	0.102	0.064	0.035	0.000	0.747	0.000	0.000	0.000

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	355	339	279	14719	593	636	1436	0	1392
normalized size	1	0.95	0.79	41.46	1.67	1.79	4.05	0.00	3.92
time (sec)	N/A	0.557	0.588	0.287	0.823	1.597	26.354	0.000	5.342

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	215	8605	415	445	998	11299	741
normalized size	1	1.00	0.95	37.91	1.83	1.96	4.40	49.78	3.26
time (sec)	N/A	0.341	0.266	0.174	0.976	0.947	13.268	3.229	4.689

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	142	4406	262	280	658	5950	356
normalized size	1	1.00	0.95	29.37	1.75	1.87	4.39	39.67	2.37
time (sec)	N/A	0.169	0.131	0.161	0.636	0.884	6.544	1.958	4.730

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	114	1809	140	150	318	2355	144
normalized size	1	1.00	1.05	16.60	1.28	1.38	2.92	21.61	1.32
time (sec)	N/A	0.098	0.110	0.143	0.906	0.691	3.006	1.063	4.241

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	418	54	56	83	427	47
normalized size	1	1.00	1.00	8.04	1.04	1.08	1.60	8.21	0.90
time (sec)	N/A	0.027	0.008	0.129	0.617	1.323	0.999	0.521	4.118

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	115	1400	0	0	0	0	-1
normalized size	1	1.00	0.82	10.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.247	0.060	0.201	0.000	1.884	0.000	0.000	0.000

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	113	105	926	138	255	0	1537	166
normalized size	1	1.30	1.21	10.64	1.59	2.93	0.00	17.67	1.91
time (sec)	N/A	0.106	0.130	0.131	0.767	10.904	0.000	1.106	5.169

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	169	5274	351	1017	0	7600	417
normalized size	1	1.00	0.92	28.82	1.92	5.56	0.00	41.53	2.28
time (sec)	N/A	0.185	0.505	0.158	0.991	139.536	0.000	2.088	7.208

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F(-1)	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	275	275	260	18285	848	0	0	0	1154
normalized size	1	1.00	0.95	66.49	3.08	0.00	0.00	0.00	4.20
time (sec)	N/A	0.396	0.716	0.184	1.285	0.000	0.000	0.000	10.670

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F(-1)	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	379	379	355	44893	1757	0	0	0	2518
normalized size	1	1.00	0.94	118.45	4.64	0.00	0.00	0.00	6.64
time (sec)	N/A	0.618	0.931	0.386	1.989	0.000	0.000	0.000	16.223

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	874	994	733	0	2140	0	0	0	-1
normalized size	1	1.14	0.84	0.00	2.45	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.744	0.979	2.581	1.907	1.869	0.000	0.000	0.000

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	532	649	486	0	1300	0	0	0	-1
normalized size	1	1.22	0.91	0.00	2.44	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.094	0.531	2.096	2.044	0.825	0.000	0.000	0.000

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	270	444	346	0	673	0	0	0	-1
normalized size	1	1.64	1.28	0.00	2.49	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.820	0.352	1.668	1.915	1.120	0.000	0.000	0.000

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	246	214	0	0	0	0	0	-1
normalized size	1	1.97	1.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.637	0.206	1.519	0.000	1.172	0.000	0.000	0.000

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	1998	431	2428	0	0	0	0	-1
normalized size	1	7.21	1.56	8.77	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	4.900	0.850	0.082	0.000	1.080	0.000	0.000	0.000

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	612	402	0	0	0	0	0	-1
normalized size	1	3.12	2.05	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	1.119	0.579	1.795	0.000	0.811	0.000	0.000	0.000

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	369	883	595	0	0	0	0	0	-1
normalized size	1	2.39	1.61	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.481	1.535	2.731	0.000	0.904	0.000	0.000	0.000

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	714	1356	894	0	0	0	0	0	-1
normalized size	1	1.90	1.25	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.381	3.182	4.238	0.000	1.162	0.000	0.000	0.000

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1159	1881	1448	0	0	0	0	0	-1
normalized size	1	1.62	1.25	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.403	7.419	6.982	0.000	1.210	0.000	0.000	0.000

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	34	30	46	32	29	20	103	28
normalized size	1	0.97	0.86	1.31	0.91	0.83	0.57	2.94	0.80
time (sec)	N/A	0.014	0.006	0.102	0.478	0.999	0.152	0.415	0.186

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.168	0.429	1.149	0.000	0.750	0.000	0.000	0.000

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.090	0.252	0.987	0.000	0.903	0.000	0.000	0.000

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.014	0.023	0.921	0.000	0.975	0.000	0.000	0.000

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.065	0.897	1.306	0.000	0.893	0.000	0.000	0.000

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.065	0.880	1.190	0.000	0.754	0.000	0.000	0.000

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.061	8.146	1.260	0.000	0.771	0.000	0.000	0.000

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.184	1.366	1.111	0.000	0.888	0.000	0.000	0.000

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	30	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.100	0.947	1.039	0.000	1.002	0.000	0.000	0.000

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.014	0.587	1.081	0.000	0.576	0.000	0.000	0.000

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.070	2.603	1.367	0.000	0.817	0.000	0.000	0.000

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.075	3.931	1.496	0.000	0.862	0.000	0.000	0.000

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.070	30.006	1.795	0.000	0.895	0.000	0.000	0.000

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	357	341	282	2438	855	660	1477	0	1403
normalized size	1	0.96	0.79	6.83	2.39	1.85	4.14	0.00	3.93
time (sec)	N/A	0.501	0.598	0.146	1.173	2.350	26.589	0.000	5.333

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	217	1783	623	468	998	447	743
normalized size	1	1.00	0.95	7.79	2.72	2.04	4.36	1.95	3.24
time (sec)	N/A	0.324	0.257	0.089	1.055	1.309	12.639	167.452	5.032

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	142	1188	419	301	692	279	362
normalized size	1	1.00	0.93	7.82	2.76	1.98	4.55	1.84	2.38
time (sec)	N/A	0.161	0.138	0.081	0.795	0.993	6.812	12.579	4.786

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	118	656	246	174	314	145	133
normalized size	1	1.00	1.13	6.31	2.37	1.67	3.02	1.39	1.28
time (sec)	N/A	0.087	0.107	0.075	0.758	0.868	2.791	1.106	4.500

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	233	57	80	104	83	50
normalized size	1	1.00	1.00	4.31	1.06	1.48	1.93	1.54	0.93
time (sec)	N/A	0.027	0.024	0.063	0.634	0.867	1.074	0.259	4.289

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	119	1143	0	0	0	0	-1
normalized size	1	1.00	0.83	7.94	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.309	0.061	0.148	0.000	0.919	0.000	0.000	0.000

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	117	108	388	192	279	0	0	191
normalized size	1	1.30	1.20	4.31	2.13	3.10	0.00	0.00	2.12
time (sec)	N/A	0.092	0.134	0.092	0.700	10.606	0.000	0.000	5.339

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	172	1554	405	1036	0	495	412
normalized size	1	1.00	0.98	8.88	2.31	5.92	0.00	2.83	2.35
time (sec)	N/A	0.170	0.547	0.191	1.052	151.718	0.000	0.771	7.448

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F(-1)	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	263	4421	900	0	0	1391	1147
normalized size	1	1.00	0.95	15.96	3.25	0.00	0.00	5.02	4.14
time (sec)	N/A	0.327	0.738	0.295	1.725	0.000	0.000	3.668	11.577

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	F(-1)	F(-1)	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	381	381	358	10401	1809	0	0	0	2520
normalized size	1	1.00	0.94	27.30	4.75	0.00	0.00	0.00	6.61
time (sec)	N/A	0.553	0.967	0.446	2.000	0.000	0.000	0.000	17.435

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	869	973	746	0	2351	0	0	0	-1
normalized size	1	1.12	0.86	0.00	2.71	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.808	0.998	1.348	1.959	1.076	0.000	0.000	0.000

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	542	659	497	0	1458	0	0	0	-1
normalized size	1	1.22	0.92	0.00	2.69	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.199	0.546	1.236	1.770	1.097	0.000	0.000	0.000

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	450	351	0	786	0	0	0	-1
normalized size	1	1.60	1.25	0.00	2.80	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.959	0.305	1.013	1.551	0.744	0.000	0.000	0.000

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	252	220	0	0	0	0	0	-1
normalized size	1	1.95	1.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.774	0.173	0.885	0.000	0.765	0.000	0.000	0.000

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	285	2126	0	0	0	0	0	0	-1
normalized size	1	7.46	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	5.846	2.302	1.064	0.000	0.798	0.000	0.000	0.000

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	620	409	0	0	0	0	0	-1
normalized size	1	3.10	2.04	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.301	0.588	1.260	0.000	1.464	0.000	0.000	0.000

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	381	899	603	0	0	0	0	0	-1
normalized size	1	2.36	1.58	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.644	1.576	1.751	0.000	0.869	0.000	0.000	0.000

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	724	1369	909	0	0	0	0	0	-1
normalized size	1	1.89	1.26	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.540	3.370	2.707	0.000	0.981	0.000	0.000	0.000

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1154	1854	1453	0	0	0	0	0	-1
normalized size	1	1.61	1.26	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.543	7.345	4.090	0.000	2.076	0.000	0.000	0.000

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.174	0.180	0.820	0.000	0.852	0.000	0.000	0.000

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.092	0.146	0.692	0.000	0.693	0.000	0.000	0.000

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.014	0.042	0.665	0.000	0.872	0.000	0.000	0.000

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.064	0.090	0.845	0.000	0.926	0.000	0.000	0.000

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.068	0.094	0.897	0.000	1.840	0.000	0.000	0.000

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.062	0.096	1.046	0.000	1.538	0.000	0.000	0.000

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.191	0.715	0.775	0.000	1.693	0.000	0.000	0.000

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.103	0.433	0.769	0.000	2.118	0.000	0.000	0.000

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.014	0.232	0.755	0.000	1.041	0.000	0.000	0.000

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.072	0.498	1.049	0.000	2.102	0.000	0.000	0.000

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.076	0.606	1.329	0.000	0.799	0.000	0.000	0.000

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.071	0.641	1.918	0.000	1.024	0.000	0.000	0.000

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-2)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	365	377	463	2576	671	805	0	0	1434
normalized size	1	1.03	1.27	7.06	1.84	2.21	0.00	0.00	3.93
time (sec)	N/A	0.712	1.009	0.656	0.802	0.856	0.000	0.000	5.132

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-2)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	248	314	1967	467	571	0	0	767
normalized size	1	1.05	1.33	8.33	1.98	2.42	0.00	0.00	3.25
time (sec)	N/A	0.456	0.610	0.572	0.659	0.861	0.000	0.000	4.761

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	170	204	1389	294	365	0	298	372
normalized size	1	1.08	1.29	8.79	1.86	2.31	0.00	1.89	2.35
time (sec)	N/A	0.240	0.393	0.513	0.940	0.931	0.000	97.810	4.471

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	128	124	839	154	192	0	149	154
normalized size	1	1.10	1.07	7.23	1.33	1.66	0.00	1.28	1.33
time (sec)	N/A	0.149	0.194	0.452	0.624	0.811	0.000	7.100	4.393

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-2)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	57	123	59	59	0	55	53
normalized size	1	1.00	1.00	2.16	1.04	1.04	0.00	0.96	0.93
time (sec)	N/A	0.030	0.013	0.051	0.820	0.904	0.000	0.205	4.111

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	156	150	597	0	0	0	0	-1
normalized size	1	1.05	1.01	4.03	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.189	0.111	0.454	0.000	0.969	0.000	0.000	0.000

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	B	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	132	117	1796	151	250	0	166	141
normalized size	1	1.10	0.98	14.97	1.26	2.08	0.00	1.38	1.18
time (sec)	N/A	0.120	0.203	0.526	0.762	11.672	0.000	0.376	4.717

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	203	178	4925	382	1127	0	523	431
normalized size	1	1.06	0.93	25.79	2.00	5.90	0.00	2.74	2.26
time (sec)	N/A	0.301	0.617	0.843	0.914	149.493	0.000	0.803	6.349

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	F(-1)	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	284	296	273	9645	920	0	0	1512	1183
normalized size	1	1.04	0.96	33.96	3.24	0.00	0.00	5.32	4.17
time (sec)	N/A	0.536	1.139	1.191	1.889	0.000	0.000	3.175	9.259

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	F(-1)	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	389	401	366	16077	1912	0	0	3293	2570
normalized size	1	1.03	0.94	41.33	4.92	0.00	0.00	8.47	6.61
time (sec)	N/A	0.821	1.209	1.728	2.969	0.000	0.000	15.659	14.282

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	F	F(-2)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	570	697	906	22955	1671	0	0	0	-1
normalized size	1	1.22	1.59	40.27	2.93	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.294	1.844	4.816	6.789	1.144	0.000	0.000	0.000

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	294	449	472	11007	903	0	0	0	-1
normalized size	1	1.53	1.61	37.44	3.07	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.955	0.975	2.711	6.534	0.936	0.000	0.000	0.000

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	195	217	4749	0	0	0	0	-1
normalized size	1	1.42	1.58	34.66	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.321	0.157	1.323	0.000	1.310	0.000	0.000	0.000

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	473	1082	0	0	0	0	0	-1
normalized size	1	1.57	3.59	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.815	0.488	2.627	0.000	0.872	0.000	0.000	0.000

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	343	3460	0	0	0	0	0	-1
normalized size	1	1.65	16.63	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.407	1.302	4.454	0.000	1.035	0.000	0.000	0.000

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	393	968	15406	0	0	0	0	0	-1
normalized size	1	2.46	39.20	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.631	6.460	1.962	0.000	0.722	0.000	0.000	0.000

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	875	1640	0	0	0	0	0	0	-1
normalized size	1	1.87	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.481	6.022	8.289	0.000	0.793	0.000	0.000	0.000

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	F	F	F	F	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	466	1030	0	0	0	0	0	0	-1
normalized size	1	2.21	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.112	3.292	8.961	0.000	0.938	0.000	0.000	0.000

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	A	F	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	408	378	0	0	0	0	0	-1
normalized size	1	2.01	1.86	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.590	0.310	4.517	0.000	2.937	0.000	0.000	0.000

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	F	F	F	F	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	425	921	0	0	0	0	0	0	-1
normalized size	1	2.17	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.642	1.528	3.758	0.000	1.133	0.000	0.000	0.000

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	302	650	0	0	0	0	0	0	-1
normalized size	1	2.15	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.807	3.128	3.364	0.000	0.817	0.000	0.000	0.000

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	B	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	629	2207	0	0	0	0	0	0	-1
normalized size	1	3.51	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.745	6.372	5.694	0.000	1.001	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [186] had the largest ratio of [.7500]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	4	3	1.00	33	0.091
2	A	4	3	1.00	33	0.091
3	A	4	3	1.00	33	0.091
4	A	4	3	1.00	31	0.097
5	A	9	8	1.50	33	0.242
6	A	4	3	1.61	33	0.091
7	A	4	3	1.00	33	0.091

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
8	A	4	3	1.00	33	0.091
9	A	4	3	1.00	33	0.091
10	A	27	13	1.52	35	0.371
11	A	23	13	1.53	35	0.371
12	A	19	13	1.53	35	0.371
13	A	15	12	1.58	33	0.364
14	B	45	23	5.72	35	0.657
15	C	24	11	3.76	35	0.314
16	C	28	11	2.17	35	0.314
17	C	32	11	1.64	35	0.314
18	C	36	11	1.34	35	0.314
19	A	0	0	0.00	0	0.000
20	A	0	0	0.00	0	0.000
21	A	0	0	0.00	0	0.000
22	F	0	0	N/A	0	N/A
23	F	0	0	N/A	0	N/A
24	A	0	0	0.00	0	0.000
25	A	0	0	0.00	0	0.000
26	A	0	0	0.00	0	0.000
27	F	0	0	N/A	0	N/A
28	F	0	0	N/A	0	N/A
29	A	4	3	1.00	33	0.091
30	A	4	3	1.00	33	0.091
31	A	4	3	1.00	33	0.091
32	A	4	3	1.00	31	0.097
33	A	9	8	1.60	33	0.242
34	A	4	3	1.05	33	0.091
35	A	4	3	1.00	33	0.091
36	A	4	3	1.00	33	0.091
37	A	4	3	1.00	33	0.091
38	A	27	13	1.17	35	0.371
39	A	23	13	1.20	35	0.371
40	A	19	13	1.26	35	0.371
41	A	15	12	1.40	33	0.364
42	B	45	23	5.71	35	0.657
43	C	24	11	3.15	35	0.314

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
44	C	28	11	1.97	35	0.314
45	C	32	11	1.72	35	0.314
46	C	36	11	1.54	35	0.314
47	A	0	0	0.00	0	0.000
48	A	0	0	0.00	0	0.000
49	A	0	0	0.00	0	0.000
50	F	0	0	N/A	0	N/A
51	F	0	0	N/A	0	N/A
52	A	0	0	0.00	0	0.000
53	A	0	0	0.00	0	0.000
54	A	0	0	0.00	0	0.000
55	F	0	0	N/A	0	N/A
56	F	0	0	N/A	0	N/A
57	A	4	3	0.96	30	0.100
58	A	4	3	1.00	30	0.100
59	A	4	3	1.00	30	0.100
60	A	4	3	1.00	28	0.107
61	A	3	2	1.00	22	0.091
62	A	9	5	1.00	30	0.167
63	A	4	3	1.31	30	0.100
64	A	4	3	1.00	30	0.100
65	A	4	3	1.00	30	0.100
66	A	4	3	1.00	30	0.100
67	A	31	13	1.15	32	0.406
68	A	27	13	1.24	32	0.406
69	A	23	12	1.66	30	0.400
70	B	20	10	2.04	24	0.417
71	B	43	21	7.52	32	0.656
72	B	29	10	3.19	32	0.312
73	B	33	11	2.42	32	0.344
74	A	37	11	1.91	32	0.344
75	A	41	11	1.63	32	0.344
76	A	0	0	0.00	0	0.000
77	A	0	0	0.00	0	0.000
78	A	0	0	0.00	0	0.000
79	A	0	0	0.00	0	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
80	A	0	0	0.00	0	0.000
81	A	0	0	0.00	0	0.000
82	A	0	0	0.00	0	0.000
83	A	0	0	0.00	0	0.000
84	A	0	0	0.00	0	0.000
85	A	0	0	0.00	0	0.000
86	A	0	0	0.00	0	0.000
87	A	0	0	0.00	0	0.000
88	A	4	3	1.00	30	0.100
89	A	4	3	1.00	30	0.100
90	A	4	3	1.00	30	0.100
91	A	4	3	1.00	28	0.107
92	A	10	8	1.50	30	0.267
93	A	4	3	1.62	30	0.100
94	A	4	3	1.00	30	0.100
95	A	4	3	1.00	30	0.100
96	A	4	3	1.00	30	0.100
97	A	28	13	1.53	32	0.406
98	A	24	13	1.53	32	0.406
99	A	20	13	1.54	32	0.406
100	A	16	12	1.58	30	0.400
101	B	46	23	5.69	32	0.719
102	C	26	11	3.73	32	0.344
103	C	30	11	2.15	32	0.344
104	C	34	11	1.63	32	0.344
105	C	38	11	1.33	32	0.344
106	A	1	1	1.04	29	0.034
107	A	1	1	1.00	18	0.056
108	A	1	1	1.00	20	0.050
109	A	0	0	0.00	0	0.000
110	A	0	0	0.00	0	0.000
111	A	0	0	0.00	0	0.000
112	F	0	0	N/A	0	N/A
113	F	0	0	N/A	0	N/A
114	A	0	0	0.00	0	0.000
115	A	0	0	0.00	0	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
116	A	0	0	0.00	0	0.000
117	F	0	0	N/A	0	N/A
118	F	0	0	N/A	0	N/A
119	A	4	3	1.00	32	0.094
120	A	4	3	1.00	32	0.094
121	A	4	3	1.00	32	0.094
122	A	4	3	1.00	30	0.100
123	A	10	8	1.47	32	0.250
124	A	4	3	1.62	32	0.094
125	A	4	3	1.00	32	0.094
126	A	4	3	1.00	32	0.094
127	A	4	3	1.00	32	0.094
128	A	28	13	1.51	34	0.382
129	A	24	13	1.47	34	0.382
130	A	20	13	1.56	34	0.382
131	A	16	12	1.55	32	0.375
132	B	46	23	5.67	34	0.676
133	C	26	11	3.69	34	0.324
134	C	30	11	2.13	34	0.324
135	C	34	11	1.61	34	0.324
136	C	38	11	1.29	34	0.324
137	A	0	0	0.00	0	0.000
138	A	0	0	0.00	0	0.000
139	A	0	0	0.00	0	0.000
140	F	0	0	N/A	0	N/A
141	F	0	0	N/A	0	N/A
142	A	0	0	0.00	0	0.000
143	A	0	0	0.00	0	0.000
144	A	0	0	0.00	0	0.000
145	F	0	0	N/A	0	N/A
146	F	0	0	N/A	0	N/A
147	A	5	3	1.07	31	0.097
148	A	5	3	1.08	31	0.097
149	A	5	3	1.11	31	0.097
150	A	5	3	1.14	29	0.103
151	A	7	6	1.10	31	0.194

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
152	A	4	3	0.74	31	0.097
153	A	5	3	1.09	31	0.097
154	A	5	3	1.07	31	0.097
155	A	5	3	1.06	31	0.097
156	A	21	11	1.68	33	0.333
157	A	18	11	1.62	33	0.333
158	A	15	11	1.58	31	0.355
159	A	10	8	1.73	33	0.242
160	A	7	3	1.47	33	0.091
161	A	12	8	1.50	33	0.242
162	C	26	11	1.71	33	0.333
163	C	29	11	1.44	33	0.333
164	A	56	13	1.49	33	0.394
165	A	40	13	1.49	33	0.394
166	A	27	13	1.86	31	0.419
167	B	14	9	2.28	33	0.273
168	A	11	3	1.96	33	0.091
169	B	21	8	2.08	33	0.242
170	C	66	16	3.07	33	0.485
171	C	93	16	2.62	33	0.485
172	F	0	0	N/A	0	N/A
173	A	4	3	1.00	30	0.100
174	A	4	3	1.00	30	0.100
175	A	4	3	1.00	30	0.100
176	A	4	3	1.00	28	0.107
177	A	10	8	1.51	30	0.267
178	A	4	3	1.58	30	0.100
179	A	4	3	1.00	30	0.100
180	A	4	3	1.00	30	0.100
181	A	4	3	1.00	30	0.100
182	A	28	13	1.11	32	0.406
183	A	24	13	1.13	32	0.406
184	A	20	13	1.16	32	0.406
185	A	16	12	1.41	30	0.400
186	B	47	24	5.62	32	0.750
187	C	26	11	3.07	32	0.344

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
188	C	30	11	1.95	32	0.344
189	C	34	11	1.70	32	0.344
190	C	38	11	1.53	32	0.344
191	A	0	0	0.00	0	0.000
192	A	0	0	0.00	0	0.000
193	A	0	0	0.00	0	0.000
194	F	0	0	N/A	0	N/A
195	F	0	0	N/A	0	N/A
196	A	0	0	0.00	0	0.000
197	A	0	0	0.00	0	0.000
198	A	0	0	0.00	0	0.000
199	F	0	0	N/A	0	N/A
200	F	0	0	N/A	0	N/A
201	A	4	3	1.00	32	0.094
202	A	4	3	1.00	32	0.094
203	A	4	3	1.00	32	0.094
204	A	4	3	1.00	30	0.100
205	A	10	8	1.46	32	0.250
206	A	4	3	1.03	32	0.094
207	A	4	3	1.00	32	0.094
208	A	4	3	1.00	32	0.094
209	A	4	3	1.00	32	0.094
210	A	28	13	1.10	34	0.382
211	A	24	13	1.11	34	0.382
212	A	20	13	1.16	34	0.382
213	A	16	12	1.38	32	0.375
214	B	46	23	5.61	34	0.676
215	C	26	11	3.06	34	0.324
216	C	30	11	1.93	34	0.324
217	C	34	11	1.70	34	0.324
218	C	38	11	1.51	34	0.324
219	A	0	0	0.00	0	0.000
220	A	0	0	0.00	0	0.000
221	A	0	0	0.00	0	0.000
222	F	0	0	N/A	0	N/A
223	F	0	0	N/A	0	N/A

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
224	A	0	0	0.00	0	0.000
225	A	0	0	0.00	0	0.000
226	A	0	0	0.00	0	0.000
227	F	0	0	N/A	0	N/A
228	F	0	0	N/A	0	N/A
229	F	0	0	N/A	0	N/A
230	A	4	3	0.95	27	0.111
231	A	4	3	1.00	27	0.111
232	A	4	3	1.00	27	0.111
233	A	4	3	1.00	25	0.120
234	A	3	2	1.00	19	0.105
235	A	10	6	1.00	27	0.222
236	A	4	3	1.30	27	0.111
237	A	4	3	1.00	27	0.111
238	A	4	3	1.00	27	0.111
239	A	4	3	1.00	27	0.111
240	A	33	13	1.14	29	0.448
241	A	29	13	1.22	29	0.448
242	A	25	12	1.64	27	0.444
243	A	22	10	1.97	21	0.476
244	B	41	21	7.21	29	0.724
245	B	32	10	3.12	29	0.345
246	B	36	11	2.39	29	0.379
247	A	40	11	1.90	29	0.379
248	A	44	11	1.62	29	0.379
249	A	4	4	0.97	14	0.286
250	A	0	0	0.00	0	0.000
251	A	0	0	0.00	0	0.000
252	A	0	0	0.00	0	0.000
253	A	0	0	0.00	0	0.000
254	A	0	0	0.00	0	0.000
255	A	0	0	0.00	0	0.000
256	A	0	0	0.00	0	0.000
257	A	0	0	0.00	0	0.000
258	A	0	0	0.00	0	0.000
259	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
260	A	0	0	0.00	0	0.000
261	A	0	0	0.00	0	0.000
262	A	4	3	0.96	29	0.103
263	A	4	3	1.00	29	0.103
264	A	4	3	1.00	29	0.103
265	A	4	3	1.00	27	0.111
266	A	3	2	1.00	21	0.095
267	A	10	6	1.00	29	0.207
268	A	4	3	1.30	29	0.103
269	A	4	3	1.00	29	0.103
270	A	4	3	1.00	29	0.103
271	A	4	3	1.00	29	0.103
272	A	33	13	1.12	31	0.419
273	A	29	13	1.22	31	0.419
274	A	25	12	1.60	29	0.414
275	A	22	10	1.95	23	0.435
276	B	44	21	7.46	31	0.677
277	B	32	10	3.10	31	0.323
278	B	36	11	2.36	31	0.355
279	A	40	11	1.89	31	0.355
280	A	44	11	1.61	31	0.355
281	A	0	0	0.00	0	0.000
282	A	0	0	0.00	0	0.000
283	A	0	0	0.00	0	0.000
284	A	0	0	0.00	0	0.000
285	A	0	0	0.00	0	0.000
286	A	0	0	0.00	0	0.000
287	A	0	0	0.00	0	0.000
288	A	0	0	0.00	0	0.000
289	A	0	0	0.00	0	0.000
290	A	0	0	0.00	0	0.000
291	A	0	0	0.00	0	0.000
292	A	0	0	0.00	0	0.000
293	A	5	3	1.03	31	0.097
294	A	5	3	1.05	31	0.097
295	A	5	3	1.08	31	0.097

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
296	A	5	3	1.10	29	0.103
297	A	3	2	1.00	23	0.087
298	A	9	5	1.05	31	0.161
299	A	6	4	1.10	31	0.129
300	A	5	3	1.06	31	0.097
301	A	5	3	1.04	31	0.097
302	A	5	3	1.03	31	0.097
303	A	23	11	1.22	33	0.333
304	A	20	11	1.53	31	0.355
305	A	10	8	1.42	25	0.320
306	A	16	10	1.57	33	0.303
307	A	10	7	1.65	33	0.212
308	B	29	16	2.46	33	0.485
309	A	53	13	1.87	33	0.394
310	B	35	13	2.21	31	0.419
311	B	14	10	2.01	25	0.400
312	B	25	11	2.17	33	0.333
313	B	14	9	2.15	33	0.273
314	B	49	21	3.51	33	0.636

Chapter 3

Listing of integrals

3.1 $\int (ag+bgx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=188

$$\frac{g^4(a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b}-\frac{Bg^4n(bc-ad)^5\log(c+dx)}{5bd^5}+\frac{Bg^4nx(bc-ad)^4}{5d^4}-\frac{Bg^4n(a+bx)^2(bc-ad)^3}{10bd^3}$$

```
[Out] 1/5*B*(-a*d+b*c)^4*g^4*n*x/d^4-1/10*B*(-a*d+b*c)^3*g^4*n*(b*x+a)^2/b/d^3+1/
15*B*(-a*d+b*c)^2*g^4*n*(b*x+a)^3/b/d^2-1/20*B*(-a*d+b*c)*g^4*n*(b*x+a)^4/b
/d+1/5*g^4*(b*x+a)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b-1/5*B*(-a*d+b*c)^5*g
^4*n*ln(d*x+c)/b/d^5
```

Rubi [A] time = 0.14, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b}+\frac{Bg^4nx(bc-ad)^4}{5d^4}-\frac{Bg^4n(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bg^4n(a+bx)^3(bc-ad)^2}{15bd^2}-$$

Antiderivative was successfully verified.

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

```
[Out] (B*(b*c - a*d)^4*g^4*n*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*n*(a + b*x)^2)/(10
*b*d^3) + (B*(b*c - a*d)^2*g^4*n*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g
^4*n*(a + b*x)^4)/(20*b*d) + (g^4*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(5*b) - (B*(b*c - a*d)^5*g^4*n*Log[c + d*x])/(5*b*d^5)
```

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

$$
\begin{aligned}
\int (ag+bgx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx &= \frac{g^4(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b}-\frac{(Bn)\int\frac{(bc-ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg}\\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b}-\frac{\left(B(bc-ad)g^4n\right)\int\frac{(a+bx)^4}{c+dx}\,d}{5b}\\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5b}-\frac{\left(B(bc-ad)g^4n\right)\int\left(-\frac{b(bc-a}{d^4}\right.}{}\\
&= \frac{B(bc-ad)^4g^4nx}{5d^4}-\frac{B(bc-ad)^3g^4n(a+bx)^2}{10bd^3}+\frac{B(bc-ad)^2g^4n(a+}{15bd^2}
\end{aligned}
$$

Mathematica [**A**] time = 0.12, size = 146, normalized size = 0.78

$$
\frac{g^4\left((a+bx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)\left(4d^3(a+bx)^3(ad-bc)+6d^2(a+bx)^2(bc-ad)^2-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(\right.}{12d^5}\right.}{5b}
$$

Antiderivative was successfully verified.

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

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

fricas [**B**] time = 1.14, size = 569, normalized size = 3.03

$$
\frac{12\,Ab^5d^5g^4x^5+12\,Ba^5d^5g^4n\log(bx+a)-12\left(Bb^5c^5-5\,Bab^4c^4d+10\,Ba^2b^3c^3d^2-10\,Ba^3b^2c^2d^3+5\,Ba^4bcd^4\right)g^4}{}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 12*B*a^5*d^5*g^4*n*log(b*x + a) - 12*(B*b^5*c^
5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4
*b*c*d^4)*g^4*n*log(d*x + c) + 3*(20*A*a*b^4*d^5*g^4 - (B*b^5*c*d^4 - B*a*b
^4*d^5)*g^4*n)*x^4 + 4*(30*A*a^2*b^3*d^5*g^4 + (B*b^5*c^2*d^3 - 5*B*a*b^4*c
*d^4 + 4*B*a^2*b^3*d^5)*g^4*n)*x^3 + 6*(20*A*a^3*b^2*d^5*g^4 - (B*b^5*c^3*d
^2 - 5*B*a*b^4*c^2*d^3 + 10*B*a^2*b^3*c*d^4 - 6*B*a^3*b^2*d^5)*g^4*n)*x^2 +
 12*(5*A*a^4*b*d^5*g^4 + (B*b^5*c^4*d - 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^
2*d^3 - 10*B*a^3*b^2*c*d^4 + 4*B*a^4*b*d^5)*g^4*n)*x + 12*(B*b^5*d^5*g^4*x^
5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*d^5*g^4
```

```
*x^2 + 5*B*a^4*b*d^5*g^4*x)*log(e) + 12*(B*b^5*d^5*g^4*n*x^5 + 5*B*a*b^4*d^
5*g^4*n*x^4 + 10*B*a^2*b^3*d^5*g^4*n*x^3 + 10*B*a^3*b^2*d^5*g^4*n*x^2 + 5*B
*a^4*b*d^5*g^4*n*x)*log((b*x + a)/(d*x + c)))/(b*d^5)
```

giac [B] time = 6.20, size = 4392, normalized size = 23.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/60*(12*(B*b^10*c^6*g^4*n - 6*B*a*b^9*c^5*d*g^4*n - 5*(b*x + a)*B*b^9*c^6*
d*g^4*n/(d*x + c) + 15*B*a^2*b^8*c^4*d^2*g^4*n + 30*(b*x + a)*B*a*b^8*c^5*d
^2*g^4*n/(d*x + c) + 10*(b*x + a)^2*B*b^8*c^6*d^2*g^4*n/(d*x + c)^2 - 20*B*
a^3*b^7*c^3*d^3*g^4*n - 75*(b*x + a)*B*a^2*b^7*c^4*d^3*g^4*n/(d*x + c) - 60
*(b*x + a)^2*B*a*b^7*c^5*d^3*g^4*n/(d*x + c)^2 - 10*(b*x + a)^3*B*b^7*c^6*d
^3*g^4*n/(d*x + c)^3 + 15*B*a^4*b^6*c^2*d^4*g^4*n + 100*(b*x + a)*B*a^3*b^6
*c^3*d^4*g^4*n/(d*x + c) + 150*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^4*n/(d*x + c
)^2 + 60*(b*x + a)^3*B*a*b^6*c^5*d^4*g^4*n/(d*x + c)^3 + 5*(b*x + a)^4*B*b^
6*c^6*d^4*g^4*n/(d*x + c)^4 - 6*B*a^5*b^5*c*d^5*g^4*n - 75*(b*x + a)*B*a^4*
b^5*c^2*d^5*g^4*n/(d*x + c) - 200*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^4*n/(d*x
+ c)^2 - 150*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^4*n/(d*x + c)^3 - 30*(b*x + a)
^4*B*a*b^5*c^5*d^5*g^4*n/(d*x + c)^4 + B*a^6*b^4*d^6*g^4*n + 30*(b*x + a)*B
*a^5*b^4*c*d^6*g^4*n/(d*x + c) + 150*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^4*n/(d
*x + c)^2 + 200*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^4*n/(d*x + c)^3 + 75*(b*x +
 a)^4*B*a^2*b^4*c^4*d^6*g^4*n/(d*x + c)^4 - 5*(b*x + a)*B*a^6*b^3*d^7*g^4*n
/(d*x + c) - 60*(b*x + a)^2*B*a^5*b^3*c*d^7*g^4*n/(d*x + c)^2 - 150*(b*x +
a)^3*B*a^4*b^3*c^2*d^7*g^4*n/(d*x + c)^3 - 100*(b*x + a)^4*B*a^3*b^3*c^3*d^
7*g^4*n/(d*x + c)^4 + 10*(b*x + a)^2*B*a^6*b^2*d^8*g^4*n/(d*x + c)^2 + 60*(
b*x + a)^3*B*a^5*b^2*c*d^8*g^4*n/(d*x + c)^3 + 75*(b*x + a)^4*B*a^4*b^2*c^2
*d^8*g^4*n/(d*x + c)^4 - 10*(b*x + a)^3*B*a^6*b*d^9*g^4*n/(d*x + c)^3 - 30*
(b*x + a)^4*B*a^5*b*c*d^9*g^4*n/(d*x + c)^4 + 5*(b*x + a)^4*B*a^6*d^10*g^4*
n/(d*x + c)^4)*log((b*x + a)/(d*x + c))/(b^5*d^5 - 5*(b*x + a)*b^4*d^6/(d*x
 + c) + 10*(b*x + a)^2*b^3*d^7/(d*x + c)^2 - 10*(b*x + a)^3*b^2*d^8/(d*x +
c)^3 + 5*(b*x + a)^4*b*d^9/(d*x + c)^4 - (b*x + a)^5*d^10/(d*x + c)^5) + (2
5*B*b^10*c^6*g^4*n - 150*B*a*b^9*c^5*d*g^4*n - 113*(b*x + a)*B*b^9*c^6*d*g^
4*n/(d*x + c) + 375*B*a^2*b^8*c^4*d^2*g^4*n + 678*(b*x + a)*B*a*b^8*c^5*d^2
*g^4*n/(d*x + c) + 196*(b*x + a)^2*B*b^8*c^6*d^2*g^4*n/(d*x + c)^2 - 500*B*
a^3*b^7*c^3*d^3*g^4*n - 1695*(b*x + a)*B*a^2*b^7*c^4*d^3*g^4*n/(d*x + c) -
1176*(b*x + a)^2*B*a*b^7*c^5*d^3*g^4*n/(d*x + c)^2 - 156*(b*x + a)^3*B*b^7*
c^6*d^3*g^4*n/(d*x + c)^3 + 375*B*a^4*b^6*c^2*d^4*g^4*n + 2260*(b*x + a)*B*
a^3*b^6*c^3*d^4*g^4*n/(d*x + c) + 2940*(b*x + a)^2*B*a^2*b^6*c^4*d^4*g^4*n/
(d*x + c)^2 + 936*(b*x + a)^3*B*a*b^6*c^5*d^4*g^4*n/(d*x + c)^3 + 48*(b*x +
 a)^4*B*b^6*c^6*d^4*g^4*n/(d*x + c)^4 - 150*B*a^5*b^5*c*d^5*g^4*n - 1695*(b
*x + a)*B*a^4*b^5*c^2*d^5*g^4*n/(d*x + c) - 3920*(b*x + a)^2*B*a^3*b^5*c^3*
d^5*g^4*n/(d*x + c)^2 - 2340*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^4*n/(d*x + c)^
3 - 288*(b*x + a)^4*B*a*b^5*c^5*d^5*g^4*n/(d*x + c)^4 + 25*B*a^6*b^4*d^6*g^
4*n + 678*(b*x + a)*B*a^5*b^4*c*d^6*g^4*n/(d*x + c) + 2940*(b*x + a)^2*B*a^
4*b^4*c^2*d^6*g^4*n/(d*x + c)^2 + 3120*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^4*n/
(d*x + c)^3 + 720*(b*x + a)^4*B*a^2*b^4*c^4*d^6*g^4*n/(d*x + c)^4 - 113*(b*
x + a)*B*a^6*b^3*d^7*g^4*n/(d*x + c) - 1176*(b*x + a)^2*B*a^5*b^3*c*d^7*g^4
*n/(d*x + c)^2 - 2340*(b*x + a)^3*B*a^4*b^3*c^2*d^7*g^4*n/(d*x + c)^3 - 960
*(b*x + a)^4*B*a^3*b^3*c^3*d^7*g^4*n/(d*x + c)^4 + 196*(b*x + a)^2*B*a^6*b^
2*d^8*g^4*n/(d*x + c)^2 + 936*(b*x + a)^3*B*a^5*b^2*c*d^8*g^4*n/(d*x + c)^3
 + 720*(b*x + a)^4*B*a^4*b^2*c^2*d^8*g^4*n/(d*x + c)^4 - 156*(b*x + a)^3*B*
a^6*b*d^9*g^4*n/(d*x + c)^3 - 288*(b*x + a)^4*B*a^5*b*c*d^9*g^4*n/(d*x + c)
^4 + 48*(b*x + a)^4*B*a^6*d^10*g^4*n/(d*x + c)^4 + 12*A*b^10*c^6*g^4 + 12*B
*b^10*c^6*g^4 - 72*A*a*b^9*c^5*d*g^4 - 72*B*a*b^9*c^5*d*g^4 - 60*(b*x + a)*
A*b^9*c^6*d*g^4/(d*x + c) - 60*(b*x + a)*B*b^9*c^6*d*g^4/(d*x + c) + 180*A*
```

```
a^2*b^8*c^4*d^2*g^4 + 180*B*a^2*b^8*c^4*d^2*g^4 + 360*(b*x + a)*A*a*b^8*c^5
*d^2*g^4/(d*x + c) + 360*(b*x + a)*B*a*b^8*c^5*d^2*g^4/(d*x + c) + 120*(b*x
 + a)^2*A*b^8*c^6*d^2*g^4/(d*x + c)^2 + 120*(b*x + a)^2*B*b^8*c^6*d^2*g^4/(
d*x + c)^2 - 240*A*a^3*b^7*c^3*d^3*g^4 - 240*B*a^3*b^7*c^3*d^3*g^4 - 900*(b
*x + a)*A*a^2*b^7*c^4*d^3*g^4/(d*x + c) - 900*(b*x + a)*B*a^2*b^7*c^4*d^3*g
^4/(d*x + c) - 720*(b*x + a)^2*A*a*b^7*c^5*d^3*g^4/(d*x + c)^2 - 720*(b*x +
 a)^2*B*a*b^7*c^5*d^3*g^4/(d*x + c)^2 - 120*(b*x + a)^3*A*b^7*c^6*d^3*g^4/(
d*x + c)^3 - 120*(b*x + a)^3*B*b^7*c^6*d^3*g^4/(d*x + c)^3 + 180*A*a^4*b^6*
c^2*d^4*g^4 + 180*B*a^4*b^6*c^2*d^4*g^4 + 1200*(b*x + a)*A*a^3*b^6*c^3*d^4*
g^4/(d*x + c) + 1200*(b*x + a)*B*a^3*b^6*c^3*d^4*g^4/(d*x + c) + 1800*(b*x
+ a)^2*A*a^2*b^6*c^4*d^4*g^4/(d*x + c)^2 + 1800*(b*x + a)^2*B*a^2*b^6*c^4*d
^4*g^4/(d*x + c)^2 + 720*(b*x + a)^3*A*a*b^6*c^5*d^4*g^4/(d*x + c)^3 + 720*
(b*x + a)^3*B*a*b^6*c^5*d^4*g^4/(d*x + c)^3 + 60*(b*x + a)^4*A*b^6*c^6*d^4*
g^4/(d*x + c)^4 + 60*(b*x + a)^4*B*b^6*c^6*d^4*g^4/(d*x + c)^4 - 72*A*a^5*b
^5*c*d^5*g^4 - 72*B*a^5*b^5*c*d^5*g^4 - 900*(b*x + a)*A*a^4*b^5*c^2*d^5*g^4
/(d*x + c) - 900*(b*x + a)*B*a^4*b^5*c^2*d^5*g^4/(d*x + c) - 2400*(b*x + a)
^2*A*a^3*b^5*c^3*d^5*g^4/(d*x + c)^2 - 2400*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g
^4/(d*x + c)^2 - 1800*(b*x + a)^3*A*a^2*b^5*c^4*d^5*g^4/(d*x + c)^3 - 1800*
(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^4/(d*x + c)^3 - 360*(b*x + a)^4*A*a*b^5*c^5
*d^5*g^4/(d*x + c)^4 - 360*(b*x + a)^4*B*a*b^5*c^5*d^5*g^4/(d*x + c)^4 + 12
*A*a^6*b^4*d^6*g^4 + 12*B*a^6*b^4*d^6*g^4 + 360*(b*x + a)*A*a^5*b^4*c*d^6*g
^4/(d*x + c) + 360*(b*x + a)*B*a^5*b^4*c*d^6*g^4/(d*x + c) + 1800*(b*x + a)
^2*A*a^4*b^4*c^2*d^6*g^4/(d*x + c)^2 + 1800*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g
^4/(d*x + c)^2 + 2400*(b*x + a)^3*A*a^3*b^4*c^3*d^6*g^4/(d*x + c)^3 + 2400*
(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^4/(d*x + c)^3 + 900*(b*x + a)^4*A*a^2*b^4*c
^4*d^6*g^4/(d*x + c)^4 + 900*(b*x + a)^4*B*a^2*b^4*c^4*d^6*g^4/(d*x + c)^4
- 60*(b*x + a)*A*a^6*b^3*d^7*g^4/(d*x + c) - 60*(b*x + a)*B*a^6*b^3*d^7*g^4
/(d*x + c) - 720*(b*x + a)^2*A*a^5*b^3*c*d^7*g^4/(d*x + c)^2 - 720*(b*x + a
)^2*B*a^5*b^3*c*d^7*g^4/(d*x + c)^2 - 1800*(b*x + a)^3*A*a^4*b^3*c^2*d^7*g^
4/(d*x + c)^3 - 1800*(b*x + a)^3*B*a^4*b^3*c^2*d^7*g^4/(d*x + c)^3 - 1200*(
b*x + a)^4*A*a^3*b^3*c^3*d^7*g^4/(d*x + c)^4 - 1200*(b*x + a)^4*B*a^3*b^3*c
^3*d^7*g^4/(d*x + c)^4 + 120*(b*x + a)^2*A*a^6*b^2*d^8*g^4/(d*x + c)^2 + 12
0*(b*x + a)^2*B*a^6*b^2*d^8*g^4/(d*x + c)^2 + 720*(b*x + a)^3*A*a^5*b^2*c*d
^8*g^4/(d*x + c)^3 + 720*(b*x + a)^3*B*a^5*b^2*c*d^8*g^4/(d*x + c)^3 + 900*
(b*x + a)^4*A*a^4*b^2*c^2*d^8*g^4/(d*x + c)^4 + 900*(b*x + a)^4*B*a^4*b^2*c
^2*d^8*g^4/(d*x + c)^4 - 120*(b*x + a)^3*A*a^6*b*d^9*g^4/(d*x + c)^3 - 120*
(b*x + a)^3*B*a^6*b*d^9*g^4/(d*x + c)^3 - 360*(b*x + a)^4*A*a^5*b*c*d^9*g^4
/(d*x + c)^4 - 360*(b*x + a)^4*B*a^5*b*c*d^9*g^4/(d*x + c)^4 + 60*(b*x + a)
^4*A*a^6*d^10*g^4/(d*x + c)^4 + 60*(b*x + a)^4*B*a^6*d^10*g^4/(d*x + c)^4)/
(b^5*d^5 - 5*(b*x + a)*b^4*d^6/(d*x + c) + 10*(b*x + a)^2*b^3*d^7/(d*x + c)
^2 - 10*(b*x + a)^3*b^2*d^8/(d*x + c)^3 + 5*(b*x + a)^4*b*d^9/(d*x + c)^4 -
 (b*x + a)^5*d^10/(d*x + c)^5) + 12*(B*b^6*c^6*g^4*n - 6*B*a*b^5*c^5*d*g^4*
n + 15*B*a^2*b^4*c^4*d^2*g^4*n - 20*B*a^3*b^3*c^3*d^3*g^4*n + 15*B*a^4*b^2*
c^2*d^4*g^4*n - 6*B*a^5*b*c*d^5*g^4*n + B*a^6*d^6*g^4*n)*log(b - (b*x + a)*
d/(d*x + c))/(b*d^5) - 12*(B*b^6*c^6*g^4*n - 6*B*a*b^5*c^5*d*g^4*n + 15*B*a
^2*b^4*c^4*d^2*g^4*n - 20*B*a^3*b^3*c^3*d^3*g^4*n + 15*B*a^4*b^2*c^2*d^4*g^
4*n - 6*B*a^5*b*c*d^5*g^4*n + B*a^6*d^6*g^4*n)*log((b*x + a)/(d*x + c))/(b*
d^5))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.33, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.47, size = 676, normalized size = 3.60

$$\frac{1}{5}Bb^4g^4x^5\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{5}Ab^4g^4x^5+Bab^3g^4x^4\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Aab^3g^4x^4+2Ba^2b^2g$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.55, size = 1046, normalized size = 5.56

$$x^2\Bigg(\frac{(5\,a\,d+5\,b\,c)\Bigg(\frac{\left(\frac{b^3\,g^4\,(25\,A\,a\,d+5\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{5\,d}-\frac{A\,b^3\,g^4\,(5\,a\,d+5\,b\,c)}{5\,d}\right)(5\,a\,d+5\,b\,c)}{5\,b\,d}-\frac{a\,b^2\,g^4\,(10\,A\,a\,d+5\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{d}+\frac{A\,a\,b^3}{d}}{10\,b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^2*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))
/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b
^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/d + (A*a*b^3*c*g^4)/d))/(1
0*b*d) - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(5*d) - (
A*b^3*g^4*(5*a*d + 5*b*c))/(5*d)))/(2*b*d) + (a^2*b*g^4*(5*A*a*d + 5*A*b*c
+ B*a*d*n - B*b*c*n))/d) - x^3*((((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n -
B*b*c*n))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(15*b
*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(3*d) + (A*a*b^3
*c*g^4)/(3*d)) + log(e*((a + b*x)/(c + d*x))^n)*((B*b^4*g^4*x^5)/5 + B*a^4*
g^4*x + 2*B*a^3*b*g^4*x^2 + B*a*b^3*g^4*x^4 + 2*B*a^2*b^2*g^4*x^3) + x*((a^
3*g^4*(5*A*a*d + 10*A*b*c + 2*B*a*d*n - 2*B*b*c*n))/d - ((5*a*d + 5*b*c)*((
(5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(5*d)
 - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4
*(10*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/d + (A*a*b^3*c*g^4)/d))/(5*b*d)
- (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(5*d) - (A*b^3*g
^4*(5*a*d + 5*b*c))/(5*d)))/(b*d) + (2*a^2*b*g^4*(5*A*a*d + 5*A*b*c + B*a*d
*n - B*b*c*n))/d))/(5*b*d) + (a*c*((((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n
```

```
 - B*b*c*n))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(5
*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/d + (A*a*b^3*c
*g^4)/d))/(b*d)) + x^4*((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/
(20*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(20*d)) - (log(c + d*x)*(B*b^4*c^5*g^4
*n + 5*B*a^4*c*d^4*g^4*n - 5*B*a*b^3*c^4*d*g^4*n - 10*B*a^3*b*c^2*d^3*g^4*n
 + 10*B*a^2*b^2*c^3*d^2*g^4*n))/(5*d^5) + (A*b^4*g^4*x^5)/5 + (B*a^5*g^4*n*
log(a + b*x))/(5*b)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.2 $\int (ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=156

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

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

Rubi [A] time = 0.11, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

```
[Out] -(B*(b*c - a*d)^3*g^3*n*x)/(4*d^3) + (B*(b*c - a*d)^2*g^3*n*(a + b*x)^2)/(8
*b*d^2) - (B*(b*c - a*d)*g^3*n*(a + b*x)^3)/(12*b*d) + (g^3*(a + b*x)^4*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b) + (B*(b*c - a*d)^4*g^3*n*Log[c +
 d*x])/(4*b*d^4)
```

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

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

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

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

$$= -\frac{B(bc-ad)^3g^3nx}{4d^3} + \frac{B(bc-ad)^2g^3n(a+bx)^2}{8bd^2} - \frac{B(bc-ad)g^3n(a}{12bd}$$

Mathematica [**A**] time = 0.11, size = 124, normalized size = 0.79

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

Antiderivative was successfully verified.

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

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

fricas [**B**] time = 1.13, size = 426, normalized size = 2.73

$$\frac{6\,Ab^4d^4g^3x^4 + 6\,Ba^4d^4g^3n\log(bx+a) + 6\left(Bb^4c^4 - 4\,Bab^3c^3d + 6\,Ba^2b^2c^2d^2 - 4\,Ba^3bcd^3\right)g^3n\log(dx+c) + 2\left(1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

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

giac [**B**] time = 4.41, size = 2986, normalized size = 19.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
2*g^3*n/(d*x + c) + 6*(b*x + a)^2*B*b^6*c^5*d^2*g^3*n/(d*x + c)^2 - 10*B*a^
3*b^5*c^2*d^3*g^3*n - 40*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3*n/(d*x + c) - 30*(
b*x + a)^2*B*a*b^5*c^4*d^3*g^3*n/(d*x + c)^2 - 4*(b*x + a)^3*B*b^5*c^5*d^3*
g^3*n/(d*x + c)^3 + 5*B*a^4*b^4*c*d^4*g^3*n + 40*(b*x + a)*B*a^3*b^4*c^2*d^
4*g^3*n/(d*x + c) + 60*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^3*n/(d*x + c)^2 + 20
*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3*n/(d*x + c)^3 - B*a^5*b^3*d^5*g^3*n - 20*(
b*x + a)*B*a^4*b^3*c*d^5*g^3*n/(d*x + c) - 60*(b*x + a)^2*B*a^3*b^3*c^2*d^5
*g^3*n/(d*x + c)^2 - 40*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^3*n/(d*x + c)^3 + 4
*(b*x + a)*B*a^5*b^2*d^6*g^3*n/(d*x + c) + 30*(b*x + a)^2*B*a^4*b^2*c*d^6*g
^3*n/(d*x + c)^2 + 40*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^3*n/(d*x + c)^3 - 6*(
b*x + a)^2*B*a^5*b*d^7*g^3*n/(d*x + c)^2 - 20*(b*x + a)^3*B*a^4*b*c*d^7*g^3
*n/(d*x + c)^3 + 4*(b*x + a)^3*B*a^5*d^8*g^3*n/(d*x + c)^3)*log((b*x + a)/(
d*x + c))/(b^4*d^4 - 4*(b*x + a)*b^3*d^5/(d*x + c) + 6*(b*x + a)^2*b^2*d^6/
(d*x + c)^2 - 4*(b*x + a)^3*b*d^7/(d*x + c)^3 + (b*x + a)^4*d^8/(d*x + c)^4
) + (11*B*b^8*c^5*g^3*n - 55*B*a*b^7*c^4*d*g^3*n - 38*(b*x + a)*B*b^7*c^5*d
*g^3*n/(d*x + c) + 110*B*a^2*b^6*c^3*d^2*g^3*n + 190*(b*x + a)*B*a*b^6*c^4*
d^2*g^3*n/(d*x + c) + 45*(b*x + a)^2*B*b^6*c^5*d^2*g^3*n/(d*x + c)^2 - 110*
B*a^3*b^5*c^2*d^3*g^3*n - 380*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3*n/(d*x + c) -
 225*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3*n/(d*x + c)^2 - 18*(b*x + a)^3*B*b^5*c
^5*d^3*g^3*n/(d*x + c)^3 + 55*B*a^4*b^4*c*d^4*g^3*n + 380*(b*x + a)*B*a^3*b
^4*c^2*d^4*g^3*n/(d*x + c) + 450*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^3*n/(d*x +
 c)^2 + 90*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3*n/(d*x + c)^3 - 11*B*a^5*b^3*d^5
*g^3*n - 190*(b*x + a)*B*a^4*b^3*c*d^5*g^3*n/(d*x + c) - 450*(b*x + a)^2*B*
a^3*b^3*c^2*d^5*g^3*n/(d*x + c)^2 - 180*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^3*n
/(d*x + c)^3 + 38*(b*x + a)*B*a^5*b^2*d^6*g^3*n/(d*x + c) + 225*(b*x + a)^2
*B*a^4*b^2*c*d^6*g^3*n/(d*x + c)^2 + 180*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^3*
n/(d*x + c)^3 - 45*(b*x + a)^2*B*a^5*b*d^7*g^3*n/(d*x + c)^2 - 90*(b*x + a)
^3*B*a^4*b*c*d^7*g^3*n/(d*x + c)^3 + 18*(b*x + a)^3*B*a^5*d^8*g^3*n/(d*x +
c)^3 + 6*A*b^8*c^5*g^3 + 6*B*b^8*c^5*g^3 - 30*A*a*b^7*c^4*d*g^3 - 30*B*a*b^
7*c^4*d*g^3 - 24*(b*x + a)*A*b^7*c^5*d*g^3/(d*x + c) - 24*(b*x + a)*B*b^7*c
^5*d*g^3/(d*x + c) + 60*A*a^2*b^6*c^3*d^2*g^3 + 60*B*a^2*b^6*c^3*d^2*g^3 +
120*(b*x + a)*A*a*b^6*c^4*d^2*g^3/(d*x + c) + 120*(b*x + a)*B*a*b^6*c^4*d^2
*g^3/(d*x + c) + 36*(b*x + a)^2*A*b^6*c^5*d^2*g^3/(d*x + c)^2 + 36*(b*x + a
)^2*B*b^6*c^5*d^2*g^3/(d*x + c)^2 - 60*A*a^3*b^5*c^2*d^3*g^3 - 60*B*a^3*b^5
*c^2*d^3*g^3 - 240*(b*x + a)*A*a^2*b^5*c^3*d^3*g^3/(d*x + c) - 240*(b*x + a
)*B*a^2*b^5*c^3*d^3*g^3/(d*x + c) - 180*(b*x + a)^2*A*a*b^5*c^4*d^3*g^3/(d*
x + c)^2 - 180*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3/(d*x + c)^2 - 24*(b*x + a)^3
*A*b^5*c^5*d^3*g^3/(d*x + c)^3 - 24*(b*x + a)^3*B*b^5*c^5*d^3*g^3/(d*x + c)
^3 + 30*A*a^4*b^4*c*d^4*g^3 + 30*B*a^4*b^4*c*d^4*g^3 + 240*(b*x + a)*A*a^3*
b^4*c^2*d^4*g^3/(d*x + c) + 240*(b*x + a)*B*a^3*b^4*c^2*d^4*g^3/(d*x + c) +
 360*(b*x + a)^2*A*a^2*b^4*c^3*d^4*g^3/(d*x + c)^2 + 360*(b*x + a)^2*B*a^2*
b^4*c^3*d^4*g^3/(d*x + c)^2 + 120*(b*x + a)^3*A*a*b^4*c^4*d^4*g^3/(d*x + c)
^3 + 120*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3/(d*x + c)^3 - 6*A*a^5*b^3*d^5*g^3
- 6*B*a^5*b^3*d^5*g^3 - 120*(b*x + a)*A*a^4*b^3*c*d^5*g^3/(d*x + c) - 120*(
b*x + a)*B*a^4*b^3*c*d^5*g^3/(d*x + c) - 360*(b*x + a)^2*A*a^3*b^3*c^2*d^5*
g^3/(d*x + c)^2 - 360*(b*x + a)^2*B*a^3*b^3*c^2*d^5*g^3/(d*x + c)^2 - 240*(
b*x + a)^3*A*a^2*b^3*c^3*d^5*g^3/(d*x + c)^3 - 240*(b*x + a)^3*B*a^2*b^3*c^
3*d^5*g^3/(d*x + c)^3 + 24*(b*x + a)*A*a^5*b^2*d^6*g^3/(d*x + c) + 24*(b*x
+ a)*B*a^5*b^2*d^6*g^3/(d*x + c) + 180*(b*x + a)^2*A*a^4*b^2*c*d^6*g^3/(d*x
 + c)^2 + 180*(b*x + a)^2*B*a^4*b^2*c*d^6*g^3/(d*x + c)^2 + 240*(b*x + a)^3
*A*a^3*b^2*c^2*d^6*g^3/(d*x + c)^3 + 240*(b*x + a)^3*B*a^3*b^2*c^2*d^6*g^3/
(d*x + c)^3 - 36*(b*x + a)^2*A*a^5*b*d^7*g^3/(d*x + c)^2 - 36*(b*x + a)^2*B
*a^5*b*d^7*g^3/(d*x + c)^2 - 120*(b*x + a)^3*A*a^4*b*c*d^7*g^3/(d*x + c)^3
- 120*(b*x + a)^3*B*a^4*b*c*d^7*g^3/(d*x + c)^3 + 24*(b*x + a)^3*A*a^5*d^8*
g^3/(d*x + c)^3 + 24*(b*x + a)^3*B*a^5*d^8*g^3/(d*x + c)^3)/(b^4*d^4 - 4*(b
*x + a)*b^3*d^5/(d*x + c) + 6*(b*x + a)^2*b^2*d^6/(d*x + c)^2 - 4*(b*x + a)
^3*b*d^7/(d*x + c)^3 + (b*x + a)^4*d^8/(d*x + c)^4) + 6*(B*b^5*c^5*g^3*n -
5*B*a*b^4*c^4*d*g^3*n + 10*B*a^2*b^3*c^3*d^2*g^3*n - 10*B*a^3*b^2*c^2*d^3*g
^3*n + 5*B*a^4*b*c*d^4*g^3*n - B*a^5*d^5*g^3*n)*log(-b + (b*x + a)*d/(d*x +
```

```
 c))/(b*d^4) - 6*(B*b^5*c^5*g^3*n - 5*B*a*b^4*c^4*d*g^3*n + 10*B*a^2*b^3*c^
3*d^2*g^3*n - 10*B*a^3*b^2*c^2*d^3*g^3*n + 5*B*a^4*b*c*d^4*g^3*n - B*a^5*d^
5*g^3*n)*log((b*x + a)/(d*x + c))/(b*d^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c -
a*d)^2)
```

maple [F] time = 0.26, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.41, size = 479, normalized size = 3.07

$$\frac{1}{4}\,Bb^{3}g^{3}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{4}\,Ab^{3}g^{3}x^{4}+Bab^{2}g^{3}x^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Aab^{2}g^{3}x^{3}+\frac{3}{2}\,Ba^{2}bg^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.40, size = 588, normalized size = 3.77

$$x^3\,\left(\frac{b^2\,g^3\,\left(16\,A\,a\,d+4\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n\right)}{12\,d}-\frac{A\,b^2\,g^3\,\left(4\,a\,d+4\,b\,c\right)}{12\,d}\right)-x^2\,\left(\frac{\left(\frac{b^2\,g^3\,\left(16\,A\,a\,d+4\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n\right)}{4\,d}-\right.}{8\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3*((b^2*g^3*(16*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(12*d) - (A*b^2*g^3
*(4*a*d + 4*b*c))/(12*d)) - x^2*((((b^2*g^3*(16*A*a*d + 4*A*b*c + B*a*d*n -
 B*b*c*n))/(4*d) - (A*b^2*g^3*(4*a*d + 4*b*c))/(4*d))*(4*a*d + 4*b*c))/(8*b
*d) - (a*b*g^3*(6*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(2*d) + (A*a*b^2*c*
g^3)/(2*d)) + log(e*((a + b*x)/(c + d*x))^n)*((B*b^3*g^3*x^4)/4 + B*a^3*g^3
*x + (3*B*a^2*b*g^3*x^2)/2 + B*a*b^2*g^3*x^3) + x*(((4*a*d + 4*b*c)*((((b^2
*g^3*(16*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(4*d) - (A*b^2*g^3*(4*a*d +
4*b*c))/(4*d))*(4*a*d + 4*b*c))/(4*b*d) - (a*b*g^3*(6*A*a*d + 4*A*b*c + B*a
*d*n - B*b*c*n))/d + (A*a*b^2*c*g^3)/d))/(4*b*d) + (a^2*g^3*(8*A*a*d + 12*A
*b*c + 3*B*a*d*n - 3*B*b*c*n))/(2*d) - (a*c*((b^2*g^3*(16*A*a*d + 4*A*b*c +
 B*a*d*n - B*b*c*n))/(4*d) - (A*b^2*g^3*(4*a*d + 4*b*c))/(4*d)))/(b*d)) + (
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.3 $\int (ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=124

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

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

Rubi **[A]** time = 0.09, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

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

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

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

$$=\frac{B(bc-ad)^2g^2nx}{3d^2}-\frac{B(bc-ad)g^2n(a+bx)^2}{6bd}+\frac{g^2(a+bx)^3\left(A+\right.}{}$$

Mathematica [A] time = 0.06, size = 103, normalized size = 0.83

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

Antiderivative was successfully verified.

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

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

fricas [B] time = 0.77, size = 296, normalized size = 2.39

$$\frac{2\,Ab^3d^3g^2x^3+2\,Ba^3d^3g^2n\log(bx+a)-2\left(Bb^3c^3-3\,Bab^2c^2d+3\,Ba^2bcd^2\right)g^2n\log(dx+c)+\left(6\,Aab^2d^3g^2-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

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

giac [B] time = 2.29, size = 1836, normalized size = 14.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
3*c*d^3*g^2*n - 18*(b*x + a)*B*a^2*b^3*c^2*d^3*g^2*n/(d*x + c) - 12*(b*x +
a)^2*B*a*b^3*c^3*d^3*g^2*n/(d*x + c)^2 + B*a^4*b^2*d^4*g^2*n + 12*(b*x + a)
*B*a^3*b^2*c*d^4*g^2*n/(d*x + c) + 18*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g^2*n/(
d*x + c)^2 - 3*(b*x + a)*B*a^4*b*d^5*g^2*n/(d*x + c) - 12*(b*x + a)^2*B*a^3
*b*c*d^5*g^2*n/(d*x + c)^2 + 3*(b*x + a)^2*B*a^4*d^6*g^2*n/(d*x + c)^2)*log
((b*x + a)/(d*x + c))/(b^3*d^3 - 3*(b*x + a)*b^2*d^4/(d*x + c) + 3*(b*x + a
)^2*b*d^5/(d*x + c)^2 - (b*x + a)^3*d^6/(d*x + c)^3) + (3*B*b^6*c^4*g^2*n -
 12*B*a*b^5*c^3*d*g^2*n - 7*(b*x + a)*B*b^5*c^4*d*g^2*n/(d*x + c) + 18*B*a^
2*b^4*c^2*d^2*g^2*n + 28*(b*x + a)*B*a*b^4*c^3*d^2*g^2*n/(d*x + c) + 4*(b*x
 + a)^2*B*b^4*c^4*d^2*g^2*n/(d*x + c)^2 - 12*B*a^3*b^3*c*d^3*g^2*n - 42*(b*
x + a)*B*a^2*b^3*c^2*d^3*g^2*n/(d*x + c) - 16*(b*x + a)^2*B*a*b^3*c^3*d^3*g
^2*n/(d*x + c)^2 + 3*B*a^4*b^2*d^4*g^2*n + 28*(b*x + a)*B*a^3*b^2*c*d^4*g^2
*n/(d*x + c) + 24*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g^2*n/(d*x + c)^2 - 7*(b*x
+ a)*B*a^4*b*d^5*g^2*n/(d*x + c) - 16*(b*x + a)^2*B*a^3*b*c*d^5*g^2*n/(d*x
+ c)^2 + 4*(b*x + a)^2*B*a^4*d^6*g^2*n/(d*x + c)^2 + 2*A*b^6*c^4*g^2 + 2*B*
b^6*c^4*g^2 - 8*A*a*b^5*c^3*d*g^2 - 8*B*a*b^5*c^3*d*g^2 - 6*(b*x + a)*A*b^5
*c^4*d*g^2/(d*x + c) - 6*(b*x + a)*B*b^5*c^4*d*g^2/(d*x + c) + 12*A*a^2*b^4
*c^2*d^2*g^2 + 12*B*a^2*b^4*c^2*d^2*g^2 + 24*(b*x + a)*A*a*b^4*c^3*d^2*g^2/
(d*x + c) + 24*(b*x + a)*B*a*b^4*c^3*d^2*g^2/(d*x + c) + 6*(b*x + a)^2*A*b^
4*c^4*d^2*g^2/(d*x + c)^2 + 6*(b*x + a)^2*B*b^4*c^4*d^2*g^2/(d*x + c)^2 - 8
*A*a^3*b^3*c*d^3*g^2 - 8*B*a^3*b^3*c*d^3*g^2 - 36*(b*x + a)*A*a^2*b^3*c^2*d
^3*g^2/(d*x + c) - 36*(b*x + a)*B*a^2*b^3*c^2*d^3*g^2/(d*x + c) - 24*(b*x +
 a)^2*A*a*b^3*c^3*d^3*g^2/(d*x + c)^2 - 24*(b*x + a)^2*B*a*b^3*c^3*d^3*g^2/
(d*x + c)^2 + 2*A*a^4*b^2*d^4*g^2 + 2*B*a^4*b^2*d^4*g^2 + 24*(b*x + a)*A*a^
3*b^2*c*d^4*g^2/(d*x + c) + 24*(b*x + a)*B*a^3*b^2*c*d^4*g^2/(d*x + c) + 36
*(b*x + a)^2*A*a^2*b^2*c^2*d^4*g^2/(d*x + c)^2 + 36*(b*x + a)^2*B*a^2*b^2*c
^2*d^4*g^2/(d*x + c)^2 - 6*(b*x + a)*A*a^4*b*d^5*g^2/(d*x + c) - 6*(b*x + a
)*B*a^4*b*d^5*g^2/(d*x + c) - 24*(b*x + a)^2*A*a^3*b*c*d^5*g^2/(d*x + c)^2
- 24*(b*x + a)^2*B*a^3*b*c*d^5*g^2/(d*x + c)^2 + 6*(b*x + a)^2*A*a^4*d^6*g^
2/(d*x + c)^2 + 6*(b*x + a)^2*B*a^4*d^6*g^2/(d*x + c)^2)/(b^3*d^3 - 3*(b*x
+ a)*b^2*d^4/(d*x + c) + 3*(b*x + a)^2*b*d^5/(d*x + c)^2 - (b*x + a)^3*d^6/
(d*x + c)^3) + 2*(B*b^4*c^4*g^2*n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b^2*c^2
*d^2*g^2*n - 4*B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log(b - (b*x + a)*d/(
d*x + c))/(b*d^3) - 2*(B*b^4*c^4*g^2*n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b^
2*c^2*d^2*g^2*n - 4*B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log((b*x + a)/(d
*x + c))/(b*d^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.27, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.39, size = 309, normalized size = 2.49

$$\frac{1}{3}\,Bb^{2}g^{2}x^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{3}\,Ab^{2}g^{2}x^{3}+Babg^{2}x^{2}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Aabg^{2}x^{2}+\frac{1}{6}\,Bb^{2}g^{2}n\Bigg(\frac{2\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

```
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*a*b*g^2*n*(a^2*l
og(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*a^2*g^2*n
*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*a^2*g^2*x*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n) + A*a^2*g^2*x
```

mupad [**B**] time = 4.28, size = 303, normalized size = 2.44

$$\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\left(B\,a^2\,g^2\,x+B\,a\,b\,g^2\,x^2+\frac{B\,b^2\,g^2\,x^3}{3}\right)-x\left(\frac{(3\,a\,d+3\,b\,c)\,\left(\frac{b\,g^2\,(9\,A\,a\,d+3\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{3\,d}-\frac{A\,b\,g^2\,(}{}\right.}{3\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [**A**] time = 60.49, size = 673, normalized size = 5.43

$$\begin{cases} a^2g^2x\left(A+B\log\left(e\left(\frac{a}{c}\right)^n\right)\right) \\ Aa^2g^2x+Aabg^2x^2+\frac{Ab^2g^2x^3}{3}+\frac{Ba^3g^2n\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{3b}+Ba^2g^2nx\log\left(\frac{a}{c}+\frac{bx}{c}\right)-\frac{Ba^2g^2nx}{3}+Ba^2g^2x\log\left(e\right)+Babg^2n \\ a^2g^2\left(Ax-\frac{Bcn\log\left(c+dx\right)}{d}+Bnx\log\left(a\right)-Bnx\log\left(c+dx\right)+Bnx+Bx\log\left(e\right)\right) \\ Aa^2g^2x+Aabg^2x^2+\frac{Ab^2g^2x^3}{3}+\frac{Ba^3g^2n\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{3b}+\frac{Ba^3g^2n\log\left(\frac{c}{d}+x\right)}{3b}-\frac{Ba^2cg^2n\log\left(\frac{c}{d}+x\right)}{d}+Ba^2g^2nx\log\left(\frac{a}{c+dx}+\right. \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((a**2*g**2*x*(A + B*log(e*(a/c)**n)), Eq(b, 0) & Eq(d, 0)), (A*a*
*2*g**2*x + A*a*b*g**2*x**2 + A*b**2*g**2*x**3/3 + B*a**3*g**2*n*log(a/c +
b*x/c)/(3*b) + B*a**2*g**2*n*x*log(a/c + b*x/c) - B*a**2*g**2*n*x/3 + B*a**
2*g**2*x*log(e) + B*a*b*g**2*n*x**2*log(a/c + b*x/c) - B*a*b*g**2*n*x**2/3
+ B*a*b*g**2*x**2*log(e) + B*b**2*g**2*n*x**3*log(a/c + b*x/c)/3 - B*b**2*g
**2*n*x**3/9 + B*b**2*g**2*x**3*log(e)/3, Eq(d, 0)), (a**2*g**2*(A*x - B*c*
n*log(c + d*x)/d + B*n*x*log(a) - B*n*x*log(c + d*x) + B*n*x + B*x*log(e)),
 Eq(b, 0)), (A*a**2*g**2*x + A*a*b*g**2*x**2 + A*b**2*g**2*x**3/3 + B*a**3*
g**2*n*log(a/(c + d*x) + b*x/(c + d*x))/(3*b) + B*a**3*g**2*n*log(c/d + x)/
(3*b) - B*a**2*c*g**2*n*log(c/d + x)/d + B*a**2*g**2*n*x*log(a/(c + d*x) +
b*x/(c + d*x)) + 2*B*a**2*g**2*n*x/3 + B*a**2*g**2*x*log(e) + B*a*b*c**2*g*
*2*n*log(c/d + x)/d**2 - B*a*b*c*g**2*n*x/d + B*a*b*g**2*n*x**2*log(a/(c +
d*x) + b*x/(c + d*x)) + B*a*b*g**2*n*x**2/6 + B*a*b*g**2*x**2*log(e) - B*b*
*2*c**3*g**2*n*log(c/d + x)/(3*d**3) + B*b**2*c**2*g**2*n*x/(3*d**2) - B*b*
*2*c*g**2*n*x**2/(6*d) + B*b**2*g**2*n*x**3*log(a/(c + d*x) + b*x/(c + d*x)
)/3 + B*b**2*g**2*x**3*log(e)/3, True))
```

3.4 $\int (ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=86

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

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

Rubi [A] time = 0.06, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = $\{2525, 12, 43\}$

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

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

Mathematica [**A**]   time = 0.04, size = 73, normalized size = 0.85

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

Antiderivative was successfully verified.

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

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

fricas [**A**]   time = 0.93, size = 160, normalized size = 1.86

$$\frac{Ab^2d^2gx^2 + Ba^2d^2gn\log(bx+a) + \left(Bb^2c^2 - 2\,Babcd\right)gn\log(dx+c) + \left(2\,Aabd^2g - \left(Bb^2cd - Babd^2\right)gn\right)x +}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [**B**]   time = 1.24, size = 864, normalized size = 10.05

$$-\frac{1}{2}\left(\frac{\left(Bb^4c^3gn - 3\,Bab^3c^2dgn - \frac{2\,(bx+a)Bb^3c^3dgn}{dx+c} + 3\,Ba^2b^2cd^2gn + \frac{6\,(bx+a)Bab^2c^2d^2gn}{dx+c} - Ba^3bd^3gn - \frac{6\,(bx+a)Ba^2bcd^3g}{dx+c}\right.}{b^2d^2 - \frac{2\,(bx+a)bd^3}{dx+c} + \frac{(bx+a)^2d^4}{(dx+c)^2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

maple [F] time = 0.18, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [A] time = 1.35, size = 156, normalized size = 1.81

$$\frac{1}{2}\,Bbgx^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{2}\,Abgx^2-\frac{1}{2}\,Bbgn\left(\frac{a^2\log\left(bx+a\right)}{b^2}-\frac{c^2\log\left(dx+c\right)}{d^2}+\frac{(bc-ad)x}{bd}\right)+Bagn\Big(a$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 4.07, size = 134, normalized size = 1.56

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy **[A]** time = 40.67, size = 398, normalized size = 4.63

$$\begin{cases} agx\left(A+B\log\left(e\left(\frac{a}{c}\right)^{n}\right)\right) \\ ag\left(Ax-\frac{Bcn\log\left(c+dx\right)}{d}+Bnx\log\left(a\right)-Bnx\log\left(c+dx\right)+Bnx+Bx\log\left(e\right)\right) \\ Aagx+\frac{Abgx^{2}}{2}+\frac{Ba^{2}gn\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{2b}+Bagnx\log\left(\frac{a}{c}+\frac{bx}{c}\right)-\frac{Bagnx}{2}+Bagx\log\left(e\right)+\frac{Bbgnx^{2}\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{2}-\frac{Bbgnx^{2}}{4}+Bbg \\ Aagx+\frac{Abgx^{2}}{2}+\frac{Ba^{2}gn\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{2b}+\frac{Ba^{2}gn\log\left(\frac{c}{d}+x\right)}{2b}-\frac{Bacgn\log\left(\frac{c}{d}+x\right)}{d}+Bagnx\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)+\frac{Bagnx}{2}+Bag \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((a*g*x*(A + B*log(e*(a/c)**n)), Eq(b, 0) & Eq(d, 0)), (a*g*(A*x -
 B*c*n*log(c + d*x)/d + B*n*x*log(a) - B*n*x*log(c + d*x) + B*n*x + B*x*log
(e)), Eq(b, 0)), (A*a*g*x + A*b*g*x**2/2 + B*a**2*g*n*log(a/c + b*x/c)/(2*b
) + B*a*g*n*x*log(a/c + b*x/c) - B*a*g*n*x/2 + B*a*g*x*log(e) + B*b*g*n*x**
2*log(a/c + b*x/c)/2 - B*b*g*n*x**2/4 + B*b*g*x**2*log(e)/2, Eq(d, 0)), (A*
a*g*x + A*b*g*x**2/2 + B*a**2*g*n*log(a/(c + d*x) + b*x/(c + d*x))/(2*b) +
B*a**2*g*n*log(c/d + x)/(2*b) - B*a*c*g*n*log(c/d + x)/d + B*a*g*n*x*log(a/
(c + d*x) + b*x/(c + d*x)) + B*a*g*n*x/2 + B*a*g*x*log(e) + B*b*c**2*g*n*lo
g(c/d + x)/(2*d**2) - B*b*c*g*n*x/(2*d) + B*b*g*n*x**2*log(a/(c + d*x) + b*
x/(c + d*x))/2 + B*b*g*x**2*log(e)/2, True))
```

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

Optimal. Leaf size=84

$$\frac{Bn\text{Li}_2\left(\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg}$$

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

Rubi [A] time = 0.21, antiderivative size = 126, normalized size of antiderivative = 1.50, number of steps used = 9, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2524, 2418, 2390, 12, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2524

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

Rubi steps

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

Mathematica [A] time = 0.05, size = 101, normalized size = 1.20

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

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.84, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

maple [F] time = 0.36, size = 0, normalized size = 0.00

$$\int\frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$B\left(\frac{\log(bx+a)\log\left((bx+a)^{n}\right)-\log(bx+a)\log\left((dx+c)^{n}\right)}{bg}+\int\frac{bdx\log(e)+bc\log(e)-(bcn-adn)\log(bx+}{b^{2}dgx^{2}+abcg+\left(b^{2}cg+abdg\right)x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=67

$$-\frac{(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{Bn}{bg^2(a+bx)}$$

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

Rubi [A] time = 0.09, antiderivative size = 108, normalized size of antiderivative = 1.61, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{bg^2(a+bx)}-\frac{Bdn\log(a+bx)}{bg^2(bc-ad)}+\frac{Bdn\log(c+dx)}{bg^2(bc-ad)}-\frac{Bn}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2525

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

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bg^2(a+bx)} + \frac{(Bn)\int \frac{bc-ad}{g(a+bx)^2(c+dx)}\,dx}{bg} \\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bg^2(a+bx)} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2} \\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bg^2(a+bx)} + \frac{(B(bc-ad)n)\int \left(\frac{b}{(bc-ad)(a+bx)^2} - \frac{bd}{(bc-ad)^2(a+bx)} + \right.}{bg^2} \\
&= -\frac{Bn}{bg^2(a+bx)} - \frac{Bdn\log(a+bx)}{b(bc-ad)g^2} - \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bg^2(a+bx)} + \frac{Bdn\log(c+dx)}{b(bc-ad)g^2}
\end{aligned}$$

Mathematica [**A**] time = 0.06, size = 115, normalized size = 1.72

$$\frac{Bn(bc-ad)\left(-\frac{1}{(a+bx)(bc-ad)} - \frac{d\log(a+bx)}{(bc-ad)^2} + \frac{d\log(c+dx)}{(bc-ad)^2}\right)}{bg^2} - \frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{bg(ag+bgx)}$$

Antiderivative was successfully verified.

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

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

fricas [**A**] time = 0.98, size = 103, normalized size = 1.54

$$-\frac{Abc - Aad + (Bbc - Bad)n + (Bbc - Bad)\log(e) + (Bbdnx + Bbcn)\log\left(\frac{bx+a}{dx+c}\right)}{\left(b^3c - ab^2d\right)g^2x + \left(ab^2c - a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, algorithm="fric
as")
```

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

giac [**A**] time = 2.91, size = 85, normalized size = 1.27

$$-\left(\frac{(dx+c)Bn\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)g^2} + \frac{(Bn+A+B)(dx+c)}{(bx+a)g^2}\right)\left(\frac{bc}{(bc-ad)^2} - \frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [**F**] time = 0.29, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [**B**] time = 1.19, size = 137, normalized size = 2.04

$$-Bn\left(\frac{1}{b^{2}g^{2}x+abg^{2}}+\frac{d\log\left(bx+a\right)}{\left(b^{2}c-abd\right)g^{2}}-\frac{d\log\left(dx+c\right)}{\left(b^{2}c-abd\right)g^{2}}\right)-\frac{B\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)}{b^{2}g^{2}x+abg^{2}}-\frac{A}{b^{2}g^{2}x+abg^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^2,x, algorithm="maxi
ma")
```

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

mupad [**B**] time = 5.65, size = 112, normalized size = 1.67

$$-\frac{A+B\,n}{x\,b^2\,g^2+a\,b\,g^2}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{b\,\left(a\,g^2+b\,g^2\,x\right)}-\frac{B\,d\,n\,\mathrm{atan}\left(\frac{b\,c\,2{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}+1{}\mathrm{i}\right)\,2{}\mathrm{i}}{b\,g^2\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

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

Optimal. Leaf size=151

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2n\log(a+bx)}{2bg^3(bc-ad)^2}-\frac{Bd^2n\log(c+dx)}{2bg^3(bc-ad)^2}+\frac{Bdn}{2bg^3(a+bx)(bc-ad)}-\frac{Bn}{4bg^3(a+bx)^2}$$

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

Rubi **[A]** time = 0.12, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2n\log(a+bx)}{2bg^3(bc-ad)^2}-\frac{Bd^2n\log(c+dx)}{2bg^3(bc-ad)^2}+\frac{Bdn}{2bg^3(a+bx)(bc-ad)}-\frac{Bn}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2525

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

Rubi steps

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

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2bg^3(a+bx)^2} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^3(c+dx)}\,dx}{2bg^3}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2bg^3(a+bx)^2} + \frac{(B(bc-ad)n)\int \left(\frac{b}{(bc-ad)(a+bx)^3} - \frac{bd}{(bc-ad)^2(a+bx)^2} + \frac{bd^2}{(bc-ad)^3}\right.}{2bg^3}$$

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

Mathematica [A] time = 0.15, size = 114, normalized size = 0.75

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

Antiderivative was successfully verified.

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

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

fricas [A] time = 0.92, size = 265, normalized size = 1.75

$$-\frac{2\,Ab^2c^2 - 4\,Aabcd + 2\,Aa^2d^2 - 2\left(Bb^2cd - Babd^2\right)nx + \left(Bb^2c^2 - 4\,Babcd + 3\,Ba^2d^2\right)n + 2\left(Bb^2c^2 - 2\,Babcd + \right.}{4\left(\left(b^5c^2 - 2\,ab^4cd + a^2b^3d^2\right)g^3x^2 + 2\left(ab^4c^2 - 2\,a^2b^3cd + a^3b^2d^2\right)g^3x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, algorithm="fric
as")
```

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

giac [A] time = 4.80, size = 220, normalized size = 1.46

$$-\frac{1}{4}\left(\frac{2\left(Bbn - \frac{2\,(bx+a)Bdn}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^2bcg^3}{(dx+c)^2} - \frac{(bx+a)^2adg^3}{(dx+c)^2}} + \frac{Bbn - \frac{4\,(bx+a)Bdn}{dx+c} + 2\,Ab + 2\,Bb - \frac{4\,(bx+a)Ad}{dx+c} - \frac{4\,(bx+a)Bd}{dx+c}}{\frac{(bx+a)^2bcg^3}{(dx+c)^2} - \frac{(bx+a)^2adg^3}{(dx+c)^2}}\right)\left(\frac{bc}{(bc-ad)^2} - \right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [F]   time = 0.28, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [A]   time = 1.36, size = 259, normalized size = 1.72

$$\frac{1}{4}\,Bn\left(\frac{2\,bdx-bc+3\,ad}{\left(b^{4}c-ab^{3}d\right)g^{3}x^{2}+2\,\left(ab^{3}c-a^{2}b^{2}d\right)g^{3}x+\left(a^{2}b^{2}c-a^{3}bd\right)g^{3}}+\frac{2\,d^{2}\log\left(bx+a\right)}{\left(b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}\right)g^{3}}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^3,x, algorithm="maxi
ma")
```

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

mupad [B]   time = 4.52, size = 222, normalized size = 1.47

$$-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c+3\,B\,a\,d\,n-B\,b\,c\,n}{2\,\left(a\,d-b\,c\right)}+\frac{B\,b\,d\,n\,x}{a\,d-b\,c}}{2\,a^2\,b\,g^3+4\,a\,b^2\,g^3\,x+2\,b^3\,g^3\,x^2}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{2\,b\,\left(a^2\,g^3+2\,a\,b\,g^3\,x+b^2\,g^3\,x^2\right)}-$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

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

Optimal. Leaf size=183

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^3n\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd^2n}{3bg^4(a+bx)(bc-ad)^2}+\frac{Bdn}{6bg^4(a+bx)^2(bc-ad)}-$$

```
[Out] -1/9*B*n/b/g^4/(b*x+a)^3+1/6*B*d*n/b/(-a*d+b*c)/g^4/(b*x+a)^2-1/3*B*d^2*n/b
/(-a*d+b*c)^2/g^4/(b*x+a)-1/3*B*d^3*n*ln(b*x+a)/b/(-a*d+b*c)^3/g^4+1/3*(-A-
B*ln(e*((b*x+a)/(d*x+c))^n))/b/g^4/(b*x+a)^3+1/3*B*d^3*n*ln(d*x+c)/b/(-a*d+
b*c)^3/g^4
```

Rubi [A] time = 0.15, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^2n}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd^3n\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bdn}{6bg^4(a+bx)^2(bc-ad)}-$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2525

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

Rubi steps

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

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bg^4(a+bx)^3} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bg^4(a+bx)^3} + \frac{(B(bc-ad)n)\int \Big(\frac{b}{(bc-ad)(a+bx)^4} - \frac{bd}{(bc-ad)^2(a+bx)^3} + \frac{}{(bc-a}}{3bg^4}$$

$$= -\frac{Bn}{9bg^4(a+bx)^3} + \frac{Bdn}{6b(bc-ad)g^4(a+bx)^2} - \frac{Bd^2n}{3b(bc-ad)^2g^4(a+bx)} - \frac{Bd^3n\log}{3b(bc-}$$

Mathematica [**A**] time = 0.17, size = 145, normalized size = 0.79

$$-\frac{\frac{Bn\left((bc-ad)\left(11a^2d^2+abd(15dx-7c)+b^2\left(2c^2-3cdx+6d^2x^2\right)\right)-6d^3(a+bx)^3\log(c+dx)+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}+6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{18bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

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

```
[Out] -1/18*(6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*n*((b*c - a*d)*(11*a^2
*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)) + 6*d^3*(
a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(
b*g^4*(a + b*x)^3)
```

fricas [**B**] time = 0.94, size = 482, normalized size = 2.63

$$-\frac{6\,Ab^3c^3-18\,Aab^2c^2d+18\,Aa^2bcd^2-6\,Aa^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)nx^2-3\left(Bb^3c^2d-6\,Bab^2cd^2+5\,Ba^2bd}{18\left(\left(b^7c^3-3\,ab^6c^2d+3\,a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/18*(6*A*b^3*c^3 - 18*A*a*b^2*c^2*d + 18*A*a^2*b*c*d^2 - 6*A*a^3*d^3 + 6*
(B*b^3*c*d^2 - B*a*b^2*d^3)*n*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + 5*B*
a^2*b*d^3)*n*x + (2*B*b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2 - 11*B*a
^3*d^3)*n + 6*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2 - B*a^3*d^3)*l
og(e) + 6*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x + (B*b
^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log((b*x + a)/(d*x + c)))/((
b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6
*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^
5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c
^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [**B**] time = 5.22, size = 375, normalized size = 2.05

$$-\frac{1}{18}\left(\frac{6\left(Bb^2n-\frac{3\,(bx+a)Bbdn}{dx+c}+\frac{3\,(bx+a)^2Bd^2n}{(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bx+a)^3abcdg^4}{(dx+c)^3}+\frac{(bx+a)^3a^2d^2g^4}{(dx+c)^3}}+\frac{2\,Bb^2n-\frac{9\,(bx+a)Bbdn}{dx+c}+\frac{18\,(bx+a)^2Bd^2n}{(dx+c)^2}+6\,Ab^2+6\,Bb^2-}{\frac{(bx+a)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bx+a)}{(dx+}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/18*(6*(B*b^2*n - 3*(b*x + a)*B*b*d*n/(d*x + c) + 3*(b*x + a)^2*B*d^2*n/(
d*x + c)^2)*log((b*x + a)/(d*x + c))/((b*x + a)^3*b^2*c^2*g^4/(d*x + c)^3 -
 2*(b*x + a)^3*a*b*c*d*g^4/(d*x + c)^3 + (b*x + a)^3*a^2*d^2*g^4/(d*x + c)^
3) + (2*B*b^2*n - 9*(b*x + a)*B*b*d*n/(d*x + c) + 18*(b*x + a)^2*B*d^2*n/(d
*x + c)^2 + 6*A*b^2 + 6*B*b^2 - 18*(b*x + a)*A*b*d/(d*x + c) - 18*(b*x + a)
*B*b*d/(d*x + c) + 18*(b*x + a)^2*A*d^2/(d*x + c)^2 + 18*(b*x + a)^2*B*d^2/
(d*x + c)^2)/((b*x + a)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x + a)^3*a*b*c*d*g
^4/(d*x + c)^3 + (b*x + a)^3*a^2*d^2*g^4/(d*x + c)^3))*(b*c/(b*c - a*d)^2 -
 a*d/(b*c - a*d)^2)
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.35, size = 432, normalized size = 2.36

$$-\frac{1}{18}\,Bn\left(\frac{6\,b^2d^2x^2+2\,b^2c^2-7\,abcd+11\,a^2d^2-3\,\left(b^2cd-5\,abd^2\right)x}{\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)g^4x^3+3\,\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\,\left(a^2b^4c^2-2\,a^3b^3cd+a^4b^2d^2\right)g^4x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^4,x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.85, size = 349, normalized size = 1.91

$$\frac{2\,A\,a\,c\,d}{3\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{A\,b\,c^2}{3\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{A\,a^2\,d^2}{3\,b\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{B\,b\,c^2\,n}{9\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{B\,l}{3\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
b*d*x*2i)/(a*d - b*c))*2i)/(3*b*g^4*(a*d - b*c)^3) - (B*log(e*((a + b*x)/(c
 + d*x))^n))/(3*b*g^4*(a + b*x)^3) - (B*b*d^2*n*x^2)/(3*g^4*(a*d - b*c)^2*(
a + b*x)^3) + (7*B*a*c*d*n)/(18*g^4*(a*d - b*c)^2*(a + b*x)^3) - (11*B*a^2*
d^2*n)/(18*b*g^4*(a*d - b*c)^2*(a + b*x)^3) - (5*B*a*d^2*n*x)/(6*g^4*(a*d -
 b*c)^2*(a + b*x)^3) + (B*b*c*d*n*x)/(6*g^4*(a*d - b*c)^2*(a + b*x)^3)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Optimal. Leaf size=215

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^4n\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{Bd^3n}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8bg^5(a+bx)^2(bc-ad)^2}$$

```
[Out] -1/16*B*n/b/g^5/(b*x+a)^4+1/12*B*d*n/b/(-a*d+b*c)/g^5/(b*x+a)^3-1/8*B*d^2*n
/b/(-a*d+b*c)^2/g^5/(b*x+a)^2+1/4*B*d^3*n/b/(-a*d+b*c)^3/g^5/(b*x+a)+1/4*B*
d^4*n*ln(b*x+a)/b/(-a*d+b*c)^4/g^5+1/4*(-A-B*ln(e*((b*x+a)/(d*x+c))^n))/b/g
^5/(b*x+a)^4-1/4*B*d^4*n*ln(d*x+c)/b/(-a*d+b*c)^4/g^5
```

Rubi [A] time = 0.19, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3n}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4n\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4bg^5(bc-ad)^4}$$

Antiderivative was successfully verified.

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

```
[Out] -(B*n)/(16*b*g^5*(a + b*x)^4) + (B*d*n)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3)
- (B*d^2*n)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3*n)/(4*b*(b*c - a*d
)^3*g^5*(a + b*x)) + (B*d^4*n*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) - (A +
B*Log[e*((a + b*x)/(c + d*x))^n])/(4*b*g^5*(a + b*x)^4) - (B*d^4*n*Log[c +
d*x])/(4*b*(b*c - a*d)^4*g^5)
```

Rule 12

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

Rule 44

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

Rule 2525

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

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^5}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4bg^5(a+bx)^4} + \frac{(Bn)\int \frac{bc-ad}{g^4(a+bx)^5(c+dx)}\,dx}{4bg} \\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4bg^5(a+bx)^4} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^5(c+dx)}\,dx}{4bg^5} \\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4bg^5(a+bx)^4} + \frac{(B(bc-ad)n)\int\left(\frac{b}{(bc-ad)(a+bx)^5} - \frac{bd}{(bc-ad)^2(a+bx)^4} + \frac{}{(bc-a}\right.}{} \\ &= -\frac{Bn}{16bg^5(a+bx)^4} + \frac{Bdn}{12b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n}{8b(bc-ad)^2g^5(a+bx)^2} + \frac{}{4b(bc}\end{aligned}$$

Mathematica [**A**] time = 0.22, size = 162, normalized size = 0.75

$$\frac{\frac{Bn\left(\frac{12d^3(bc-ad)}{a+bx}-\frac{6d^2(bc-ad)^2}{(a+bx)^2}+\frac{4d(bc-ad)^3}{(a+bx)^3}-\frac{3(bc-ad)^4}{(a+bx)^4}+12d^4\log(a+bx)-12d^4\log(c+dx)\right)}{12(bc-ad)^4}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{(a+bx)^4}}{4bg^5}$$

Antiderivative was successfully verified.

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

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

fricas [**B**] time = 0.71, size = 733, normalized size = 3.41

$$-\frac{12\,Ab^4c^4 - 48\,Aab^3c^3d + 72\,Aa^2b^2c^2d^2 - 48\,Aa^3bcd^3 + 12\,Aa^4d^4 - 12\left(Bb^4cd^3 - Bab^3d^4\right)nx^3 + 6\left(Bb^4c^2d^2 -\right.}{48\left(\left(b^9c^4 - 4\,ab^8c^3d + 6\,a^2b^7c^2d^2 -\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/48*(12*A*b^4*c^4 - 48*A*a*b^3*c^3*d + 72*A*a^2*b^2*c^2*d^2 - 48*A*a^3*b*
c*d^3 + 12*A*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*n*x^3 + 6*(B*b^4*c^2*
d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4)*n*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3
*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*b*d^4)*n*x + (3*B*b^4*c^4 - 16*B*a
*b^3*c^3*d + 36*B*a^2*b^2*c^2*d^2 - 48*B*a^3*b*c*d^3 + 25*B*a^4*d^4)*n + 12
*(B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B*a
^4*d^4)*log(e) - 12*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2*b^2*d^
4*n*x^2 + 4*B*a^3*b*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^
2*d^2 - 4*B*a^3*b*c*d^3)*n)*log((b*x + a)/(d*x + c)))/((b^9*c^4 - 4*a*b^8*c
^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^
8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4
)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^
4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b
^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^
4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

giac [B] time = 8.37, size = 533, normalized size = 2.48

$$-\frac{1}{48}\left(\frac{12\left(Bb^3n-\frac{4\,(bx+a)Bb^2dn}{dx+c}+\frac{6\,(bx+a)^2Bbd^2n}{(dx+c)^2}-\frac{4\,(bx+a)^3Bd^3n}{(dx+c)^3}\right)\log\left(\frac{bx+a}{dx+c}\right)}{\frac{(bx+a)^4b^3c^3g^5}{(dx+c)^4}-\frac{3\,(bx+a)^4ab^2c^2dg^5}{(dx+c)^4}+\frac{3\,(bx+a)^4a^2bcd^2g^5}{(dx+c)^4}-\frac{(bx+a)^4a^3d^3g^5}{(dx+c)^4}}+\frac{3\,Bb^3n-\frac{16\,(bx+a)Bb^2dn}{dx+c}+\frac{36\,(bx+a)^2Bbd^2n}{(dx+c)^2}-}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/48*(12*(B*b^3*n - 4*(b*x + a)*B*b^2*d*n/(d*x + c) + 6*(b*x + a)^2*B*b*d^
2*n/(d*x + c)^2 - 4*(b*x + a)^3*B*d^3*n/(d*x + c)^3)*log((b*x + a)/(d*x + c
))/((b*x + a)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x + a)^4*a*b^2*c^2*d*g^5/(d*
x + c)^4 + 3*(b*x + a)^4*a^2*b*c*d^2*g^5/(d*x + c)^4 - (b*x + a)^4*a^3*d^3*
g^5/(d*x + c)^4) + (3*B*b^3*n - 16*(b*x + a)*B*b^2*d*n/(d*x + c) + 36*(b*x
+ a)^2*B*b*d^2*n/(d*x + c)^2 - 48*(b*x + a)^3*B*d^3*n/(d*x + c)^3 + 12*A*b^
3 + 12*B*b^3 - 48*(b*x + a)*A*b^2*d/(d*x + c) - 48*(b*x + a)*B*b^2*d/(d*x +
 c) + 72*(b*x + a)^2*A*b*d^2/(d*x + c)^2 + 72*(b*x + a)^2*B*b*d^2/(d*x + c)
^2 - 48*(b*x + a)^3*A*d^3/(d*x + c)^3 - 48*(b*x + a)^3*B*d^3/(d*x + c)^3)/(
(b*x + a)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x + a)^4*a*b^2*c^2*d*g^5/(d*x +
c)^4 + 3*(b*x + a)^4*a^2*b*c*d^2*g^5/(d*x + c)^4 - (b*x + a)^4*a^3*d^3*g^5/
(d*x + c)^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.60, size = 651, normalized size = 3.03

$$\frac{1}{48}\,Bn\left(\frac{12\,b^3d^3x^3-3\,b^3c^3+13\,ab^2c^2d-23\,a^2bcd^2}{\left(b^8c^3-3\,ab^7c^2d+3\,a^2b^6cd^2-a^3b^5d^3\right)g^5x^4+4\left(ab^7c^3-3\,a^2b^6c^2d+3\,a^3b^5cd^2-a^4b^4d^3\right)g^5x^3+6\left(a^2b^6c^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(b*g*x+a*g)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/48*B*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 2
5*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2
+ 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^
3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3
)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^
3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d
^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g
^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4
*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*
c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*B*log(
e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b
^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^
5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

mupad [B] time = 5.12, size = 603, normalized size = 2.80

$$-\frac{\frac{12\,A\,a^3\,d^3-12\,A\,b^3\,c^3+25\,B\,a^3\,d^3\,n-3\,B\,b^3\,c^3\,n+36\,A\,a\,b^2\,c^2\,d-36\,A\,a^2\,b\,c\,d^2+13\,B\,a\,b^2\,c^2\,d\,n-23\,B\,a^2\,b\,c\,d^2\,n}{12\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}+\frac{d\,x\,(13\,B\,n\,a^2\,b\,d^2-5\,B\,n\,a\,b^2\,c\,d+}{3\,(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-}}{4\,a^4\,b\,g^5+16\,a^3\,b^2\,g^5\,x+24\,a^2\,b^3\,g^5\,x^2+16\,a\,b^4\,g^5\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] - ((12*A*a^3*d^3 - 12*A*b^3*c^3 + 25*B*a^3*d^3*n - 3*B*b^3*c^3*n + 36*A*a*b
^2*c^2*d - 36*A*a^2*b*c*d^2 + 13*B*a*b^2*c^2*d*n - 23*B*a^2*b*c*d^2*n)/(12*
(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d*x*(B*b^3*c^2*n +
13*B*a^2*b*d^2*n - 5*B*a*b^2*c*d*n))/(3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d
- 3*a^2*b*c*d^2)) - (d^2*x^2*(B*b^3*c*n - 7*B*a*b^2*d*n))/(2*(a^3*d^3 - b^3
*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (B*b^3*d^3*n*x^3)/(a^3*d^3 - b^3*c
^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))/(4*a^4*b*g^5 + 4*b^5*g^5*x^4 + 16*a^3*
b^2*g^5*x + 16*a*b^4*g^5*x^3 + 24*a^2*b^3*g^5*x^2) - (B*log(e*((a + b*x)/(c
 + d*x))^n))/(4*b*(a^4*g^5 + b^4*g^5*x^4 + 4*a*b^3*g^5*x^3 + 6*a^2*b^2*g^5*
x^2 + 4*a^3*b*g^5*x)) - (B*d^4*n*atanh((4*b^5*c^4*g^5 - 4*a^4*b*d^4*g^5 - 8
*a*b^4*c^3*d*g^5 + 8*a^3*b^2*c*d^3*g^5)/(4*b*g^5*(a*d - b*c)^4) - (2*b*d*x*
(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))/(a*d - b*c)^4))/(2*b*g
^5*(a*d - b*c)^4)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.10 $\int(ag+bgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=396

$$\frac{Bg^4n(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(12B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+12A+25Bn\right)}{30bd^5}+\frac{Bg^4n(a+bx)(bc-ad)^4\left(12B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{30bd^4}$$

```
[Out] -1/10*B*(-a*d+b*c)*g^4*n*(b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d+1/5*
g^4*(b*x+a)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/30*B*(-a*d+b*c)^2*g^4*n
*(b*x+a)^3*(4*A+B*n+4*B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^2-1/60*B*(-a*d+b*c)^
3*g^4*n*(b*x+a)^2*(12*A+7*B*n+12*B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^3+1/30*B*
(-a*d+b*c)^4*g^4*n*(b*x+a)*(12*A+13*B*n+12*B*ln(e*((b*x+a)/(d*x+c))^n))/b/d
^4+1/30*B*(-a*d+b*c)^5*g^4*n*(12*A+25*B*n+12*B*ln(e*((b*x+a)/(d*x+c))^n))*l
n((-a*d+b*c)/b/(d*x+c))/b/d^5+2/5*B^2*(-a*d+b*c)^5*g^4*n^2*polylog(2,d*(b*x
+a)/b/(d*x+c))/b/d^5
```

Rubi **[A]** time = 0.87, antiderivative size = 602, normalized size of antiderivative = 1.52, number of steps used = 27, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^4n^2(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}-\frac{2Bg^4n(bc-ad)^5\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5bd^5}-\frac{Bg^4n(a+bx)^2(bc}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^4*g^4*n*x)/(5*d^4) + (13*B^2*(b*c - a*d)^4*g^4*n^2*x)/(3
0*d^4) - (7*B^2*(b*c - a*d)^3*g^4*n^2*(a + b*x)^2)/(60*b*d^3) + (B^2*(b*c -
 a*d)^2*g^4*n^2*(a + b*x)^3)/(30*b*d^2) + (2*B^2*(b*c - a*d)^4*g^4*n*(a + b
*x)*Log[e*((a + b*x)/(c + d*x))^n])/(5*b*d^4) - (B*(b*c - a*d)^3*g^4*n*(a +
 b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b*d^3) + (2*B*(b*c - a*d
)^2*g^4*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(15*b*d^2) -
(B*(b*c - a*d)*g^4*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(1
0*b*d) + (g^4*(a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*b) -
 (5*B^2*(b*c - a*d)^5*g^4*n^2*Log[c + d*x])/(6*b*d^5) + (2*B^2*(b*c - a*d)^
5*g^4*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(5*b*d^5) - (2*B*
(b*c - a*d)^5*g^4*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(5
*b*d^5) - (B^2*(b*c - a*d)^5*g^4*n^2*Log[c + d*x]^2)/(5*b*d^5) + (2*B^2*(b*
c - a*d)^5*g^4*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(5*b*d^5)
```

Rule 12

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

Rule 31

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

Rule 43

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

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2486

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

Rule 2524

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

Rule 2525

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

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

Rule 2528

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

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b} - \frac{(2Bn)\int \frac{(bc-ad)g^5(a+bx)^4(A}{c+d}}{5bg}$$

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

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

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

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} - \frac{B(bc-ad)^3g^4n(a+bx)^2 (A+B\log (e (\frac{a+}{c+}}{5bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{2B^2(bc-ad)^4g^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{5bd^4}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{2B^2(bc-ad)^4g^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{5bd^4}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30d^4} - \frac{7B^2(bc-ad)^3g^4n^2}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30d^4} - \frac{7B^2(bc-ad)^3g^4n^2}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30d^4} - \frac{7B^2(bc-ad)^3g^4n^2}{60bd^3}$$

Mathematica [A] time = 0.52, size = 535, normalized size = 1.35

$$g^4 (\frac{Bn(bc-ad)\left(-6d^4(a+bx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+8d^3(a+bx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-12d^2(a+bx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-24(bc-ad}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)
*n*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) - 6*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2
4*B*(b*c - a*d)^4*n*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[c + d*x] + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d
^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*
c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*
c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log
[c + d*x]) + 12*B*(b*c - a*d)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12*
d^5)))/(5*b)
```

fricas [F] time = 0.90, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \left(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log(e*((b*x + a)/(d*
x + c))^n)^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4
*x^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log(e*((b*x + a)/(d*x + c))^n), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.27, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^4 \left(B \ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 8.29, size = 2945, normalized size = 7.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/5*A*B*b^4*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b^4*g^
4*x^5 + 2*A*B*a*b^3*g^4*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*
b^3*g^4*x^4 + 4*A*B*a^2*b^2*g^4*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
+ 2*A^2*a^2*b^2*g^4*x^3 + 4*A*B*a^3*b*g^4*x^2*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + 2*A^2*a^3*b*g^4*x^2 + 1/30*A*B*b^4*g^4*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/3*A*B*a*b^3*g^4*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 2*A*B*a^2*b^2*g^4*n*(2*a^3*log
(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*
c^2 - a^2*d^2)*x)/(b^2*d^2)) - 4*A*B*a^3*b*g^4*n*(a^2*log(b*x + a)/b^2 - c^
2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^4*g^4*n*(a*log(b*x + a)
/b - c*log(d*x + c)/d) + 2*A*B*a^4*g^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n) + A^2*a^4*g^4*x - 1/30*((25*g^4*n^2 + 12*g^4*n*log(e))*b^4*c^5 - (113*
g^4*n^2 + 60*g^4*n*log(e))*a*b^3*c^4*d + 4*(49*g^4*n^2 + 30*g^4*n*log(e))*a
^2*b^2*c^3*d^2 - 12*(13*g^4*n^2 + 10*g^4*n*log(e))*a^3*b*c^2*d^3 + 12*(4*g^
4*n^2 + 5*g^4*n*log(e))*a^4*c*d^4)*B^2*log(d*x + c)/d^5 - 2/5*(b^5*c^5*g^4*
n^2 - 5*a*b^4*c^4*d*g^4*n^2 + 10*a^2*b^3*c^3*d^2*g^4*n^2 - 10*a^3*b^2*c^2*d
^3*g^4*n^2 + 5*a^4*b*c*d^4*g^4*n^2 - a^5*d^5*g^4*n^2)*(log(b*x + a)*log((b*
d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^5
) + 1/60*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 - 12*B^2*a^5*d^5*g^4*n^2*log(b*x
+ a)^2 - 6*(b^5*c*d^4*g^4*n*log(e) - (g^4*n*log(e) + 10*g^4*log(e)^2)*a*b^4
*d^5)*B^2*x^4 + 2*((g^4*n^2 + 4*g^4*n*log(e))*b^5*c^2*d^3 - 2*(g^4*n^2 + 10
*g^4*n*log(e))*a*b^4*c*d^4 + (g^4*n^2 + 16*g^4*n*log(e) + 60*g^4*log(e)^2)*
a^2*b^3*d^5)*B^2*x^3 - ((7*g^4*n^2 + 12*g^4*n*log(e))*b^5*c^3*d^2 - 3*(9*g^
4*n^2 + 20*g^4*n*log(e))*a*b^4*c^2*d^3 + 3*(11*g^4*n^2 + 40*g^4*n*log(e))*a
^2*b^3*c*d^4 - (13*g^4*n^2 + 72*g^4*n*log(e) + 120*g^4*log(e)^2)*a^3*b^2*d^
5)*B^2*x^2 + 24*(b^5*c^5*g^4*n^2 - 5*a*b^4*c^4*d*g^4*n^2 + 10*a^2*b^3*c^3*d
^2*g^4*n^2 - 10*a^3*b^2*c^2*d^3*g^4*n^2 + 5*a^4*b*c*d^4*g^4*n^2)*B^2*log(b*
x + a)*log(d*x + c) - 12*(b^5*c^5*g^4*n^2 - 5*a*b^4*c^4*d*g^4*n^2 + 10*a^2*
b^3*c^3*d^2*g^4*n^2 - 10*a^3*b^2*c^2*d^3*g^4*n^2 + 5*a^4*b*c*d^4*g^4*n^2)*B
^2*log(d*x + c)^2 + 2*((13*g^4*n^2 + 12*g^4*n*log(e))*b^5*c^4*d - (59*g^4*n
^2 + 60*g^4*n*log(e))*a*b^4*c^3*d^2 + 6*(17*g^4*n^2 + 20*g^4*n*log(e))*a^2*
b^3*c^2*d^3 - (79*g^4*n^2 + 120*g^4*n*log(e))*a^3*b^2*c*d^4 + (23*g^4*n^2 +
 48*g^4*n*log(e) + 30*g^4*log(e)^2)*a^4*b*d^5)*B^2*x + 2*(12*a*b^4*c^4*d*g^
4*n^2 - 54*a^2*b^3*c^3*d^2*g^4*n^2 + 94*a^3*b^2*c^2*d^3*g^4*n^2 - 77*a^4*b*
c*d^4*g^4*n^2 + (25*g^4*n^2 + 12*g^4*n*log(e))*a^5*d^5)*B^2*log(b*x + a) +
12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^3*d^5*g^4*
x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x)*log((b*x + a)^n)^
2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^3*d^5*
g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x)*log((d*x + c)
^n)^2 + 2*(12*B^2*b^5*d^5*g^4*x^5*log(e) + 12*B^2*a^5*d^5*g^4*n*log(b*x + a
) - 3*(b^5*c*d^4*g^4*n - (g^4*n + 20*g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 4*(b^
5*c^2*d^3*g^4*n - 5*a*b^4*c*d^4*g^4*n + 2*(2*g^4*n + 15*g^4*log(e))*a^2*b^3
*d^5)*B^2*x^3 - 6*(b^5*c^3*d^2*g^4*n - 5*a*b^4*c^2*d^3*g^4*n + 10*a^2*b^3*c
*d^4*g^4*n - 2*(3*g^4*n + 10*g^4*log(e))*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^4
*d*g^4*n - 5*a*b^4*c^3*d^2*g^4*n + 10*a^2*b^3*c^2*d^3*g^4*n - 10*a^3*b^2*c*
d^4*g^4*n + (4*g^4*n + 5*g^4*log(e))*a^4*b*d^5)*B^2*x - 12*(b^5*c^5*g^4*n -
 5*a*b^4*c^4*d*g^4*n + 10*a^2*b^3*c^3*d^2*g^4*n - 10*a^3*b^2*c^2*d^3*g^4*n
+ 5*a^4*b*c*d^4*g^4*n)*B^2*log(d*x + c))*log((b*x + a)^n) - 2*(12*B^2*b^5*d
^5*g^4*x^5*log(e) + 12*B^2*a^5*d^5*g^4*n*log(b*x + a) - 3*(b^5*c*d^4*g^4*n
- (g^4*n + 20*g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 4*(b^5*c^2*d^3*g^4*n - 5*a*b
^4*c*d^4*g^4*n + 2*(2*g^4*n + 15*g^4*log(e))*a^2*b^3*d^5)*B^2*x^3 - 6*(b^5*
c^3*d^2*g^4*n - 5*a*b^4*c^2*d^3*g^4*n + 10*a^2*b^3*c*d^4*g^4*n - 2*(3*g^4*n
 + 10*g^4*log(e))*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^4*d*g^4*n - 5*a*b^4*c^3*
d^2*g^4*n + 10*a^2*b^3*c^2*d^3*g^4*n - 10*a^3*b^2*c*d^4*g^4*n + (4*g^4*n +
```

```
5*g^4*log(e))*a^4*b*d^5)*B^2*x - 12*(b^5*c^5*g^4*n - 5*a*b^4*c^4*d*g^4*n +
10*a^2*b^3*c^3*d^2*g^4*n - 10*a^3*b^2*c^2*d^3*g^4*n + 5*a^4*b*c*d^4*g^4*n)*
B^2*log(d*x + c) + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B
^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x
)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
[Out] int((a*g + b*g*x)^4*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
[Out] Timed out
```

3.11 $\int (ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=335

$$-\frac{Bg^3n(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{12bd^4}-\frac{Bg^3n(a+bx)(bc-ad)^3\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6\right.}{12bd^3}$$

```
[Out] -1/6*B*(-a*d+b*c)*g^3*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d+1/4*g
^3*(b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+1/12*B*(-a*d+b*c)^2*g^3*n*
(b*x+a)^2*(3*A+B*n+3*B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^2-1/12*B*(-a*d+b*c)^3
*g^3*n*(b*x+a)*(6*A+5*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^3-1/12*B*(-a*d
+b*c)^4*g^3*n*(6*A+11*B*n+6*B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d
*x+c))/b/d^4-1/2*B^2*(-a*d+b*c)^4*g^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b/
d^4
```

Rubi [A] time = 0.71, antiderivative size = 512, normalized size of antiderivative = 1.53, number of steps used = 23, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bd^4}+\frac{Bg^3n(bc-ad)^4\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2bd^4}+\frac{Bg^3n(a+bx)^2(bc}{}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 31

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

Rule 43

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2486

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

Rule 2524

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

Rule 2525

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

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

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

Rubi steps

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

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

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

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

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} + \frac{B(bc-ad)^2g^3n(a+bx)^2 \left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{4bd^2}$$

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

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

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} - \frac{5B^2(bc-ad)^3g^3n^2x}{12d^3} + \frac{B^2(bc-ad)^2g^3n^2(}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} - \frac{5B^2(bc-ad)^3g^3n^2x}{12d^3} + \frac{B^2(bc-ad)^2g^3n^2(}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} - \frac{5B^2(bc-ad)^3g^3n^2x}{12d^3} + \frac{B^2(bc-ad)^2g^3n^2(}{12bd^2}$$

Mathematica [A] time = 0.35, size = 411, normalized size = 1.23

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

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*
g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log(e*((b*x + a)/(d*x + c))^n),
x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 8.02, size = 2175, normalized size = 6.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

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

```
b^2*g^3*x^3 + 3*A*B*a^2*b*g^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
3/2*A^2*a^2*b*g^3*x^2 - 1/12*A*B*b^3*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*
log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*a*b^2*g^3*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*a^2*b*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^3*g^3*n*(a*log(b*x + a)/b
 - c*log(d*x + c)/d) + 2*A*B*a^3*g^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + A^2*a^3*g^3*x + 1/12*((11*g^3*n^2 + 6*g^3*n*log(e))*b^3*c^4 - 2*(19*g^
3*n^2 + 12*g^3*n*log(e))*a*b^2*c^3*d + 9*(5*g^3*n^2 + 4*g^3*n*log(e))*a^2*b
*c^2*d^2 - 6*(3*g^3*n^2 + 4*g^3*n*log(e))*a^3*c*d^3)*B^2*log(d*x + c)/d^4 +
 1/2*(b^4*c^4*g^3*n^2 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c^2*d^2*g^3*n^2 -
 4*a^3*b*c*d^3*g^3*n^2 + a^4*d^4*g^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(
b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^4) + 1/12*(3*
B^2*b^4*d^4*g^3*x^4*log(e)^2 - 3*B^2*a^4*d^4*g^3*n^2*log(b*x + a)^2 - 2*(b^
4*c*d^3*g^3*n*log(e) - (g^3*n*log(e) + 6*g^3*log(e)^2)*a*b^3*d^4)*B^2*x^3 +
 ((g^3*n^2 + 3*g^3*n*log(e))*b^4*c^2*d^2 - 2*(g^3*n^2 + 6*g^3*n*log(e))*a*b
^3*c*d^3 + (g^3*n^2 + 9*g^3*n*log(e) + 18*g^3*log(e)^2)*a^2*b^2*d^4)*B^2*x^
2 - 6*(b^4*c^4*g^3*n^2 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c^2*d^2*g^3*n^2
- 4*a^3*b*c*d^3*g^3*n^2)*B^2*log(b*x + a)*log(d*x + c) + 3*(b^4*c^4*g^3*n^2
 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c^2*d^2*g^3*n^2 - 4*a^3*b*c*d^3*g^3*n^
2)*B^2*log(d*x + c)^2 - ((5*g^3*n^2 + 6*g^3*n*log(e))*b^4*c^3*d - (17*g^3*n
^2 + 24*g^3*n*log(e))*a*b^3*c^2*d^2 + (19*g^3*n^2 + 36*g^3*n*log(e))*a^2*b^
2*c*d^3 - (7*g^3*n^2 + 18*g^3*n*log(e) + 12*g^3*log(e)^2)*a^3*b*d^4)*B^2*x
- (6*a*b^3*c^3*d*g^3*n^2 - 21*a^2*b^2*c^2*d^2*g^3*n^2 + 26*a^3*b*c*d^3*g^3*
n^2 - (11*g^3*n^2 + 6*g^3*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4*
d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a
^3*b*d^4*g^3*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d
^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x)*log((d*x +
c)^n)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) + 6*B^2*a^4*d^4*g^3*n*log(b*x + a)
- 2*(b^4*c*d^3*g^3*n - (g^3*n + 12*g^3*log(e))*a*b^3*d^4)*B^2*x^3 + 3*(b^4*
c^2*d^2*g^3*n - 4*a*b^3*c*d^3*g^3*n + 3*(g^3*n + 4*g^3*log(e))*a^2*b^2*d^4)
*B^2*x^2 - 6*(b^4*c^3*d*g^3*n - 4*a*b^3*c^2*d^2*g^3*n + 6*a^2*b^2*c*d^3*g^3
*n - (3*g^3*n + 4*g^3*log(e))*a^3*b*d^4)*B^2*x + 6*(b^4*c^4*g^3*n - 4*a*b^3
*c^3*d*g^3*n + 6*a^2*b^2*c^2*d^2*g^3*n - 4*a^3*b*c*d^3*g^3*n)*B^2*log(d*x +
 c))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g^3*x^4*log(e) + 6*B^2*a^4*d^4*g^3*n
*log(b*x + a) - 2*(b^4*c*d^3*g^3*n - (g^3*n + 12*g^3*log(e))*a*b^3*d^4)*B^2
*x^3 + 3*(b^4*c^2*d^2*g^3*n - 4*a*b^3*c*d^3*g^3*n + 3*(g^3*n + 4*g^3*log(e)
)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3*n - 4*a*b^3*c^2*d^2*g^3*n + 6*a^2
*b^2*c*d^3*g^3*n - (3*g^3*n + 4*g^3*log(e))*a^3*b*d^4)*B^2*x + 6*(b^4*c^4*g
^3*n - 4*a*b^3*c^3*d*g^3*n + 6*a^2*b^2*c^2*d^2*g^3*n - 4*a^3*b*c*d^3*g^3*n)
*B^2*log(d*x + c) + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^
2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x)*log((b*x + a)^n))*log((d*x +
 c)^n))/(b*d^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.12 $\int (ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=274

$$\frac{Bg^2n(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A+3Bn\right)}{3bd^3}+\frac{Bg^2n(a+bx)(bc-ad)^2\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+2A\right.}{3bd^2}$$

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

Rubi [**A**] time = 0.58, antiderivative size = 420, normalized size of antiderivative = 1.53, number of steps used = 19, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}-\frac{2Bg^2n(bc-ad)^3\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3bd^3}+\frac{2ABg^2nx(bc-ad}{3d^2}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 31

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

Rule 43

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2486

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

Rule 2524

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

Rule 2525

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

Rule 2528

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

Rubi steps

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

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

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

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

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

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

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

$$= \frac{2AB(bc-ad)^2g^2nx}{3d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2n(a}{3b}$$

$$= \frac{2AB(bc-ad)^2g^2nx}{3d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2n(a}{3b}$$

$$= \frac{2AB(bc-ad)^2g^2nx}{3d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2n(a}{3b}$$

Mathematica [A] time = 0.23, size = 303, normalized size = 1.11

$$\frac{g^2\left(\frac{Bn(bc-ad)\left(-d^2(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2Abdx(bc-ad)+2Bd(a+bx)(bc-ad)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn(}{d^3}\right.}{}$$

Antiderivative was successfully verified.

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

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

```
 + d*x))^n] - d^2*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*
(b*c - a*d)^2*n*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])*Log[c + d*x] + B*(b*c - a*d)*n*(b*d*x + (-(b*c) + a*d)*Log[c + d
*x]) + B*(b*c - a*d)^2*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*
x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(3*b)
```

fricas [F] time = 0.80, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^{2}b^{2}g^{2}x^{2} + 2\,A^{2}abg^{2}x + A^{2}a^{2}g^{2} + \left(B^{2}b^{2}g^{2}x^{2} + 2\,B^{2}abg^{2}x + B^{2}a^{2}g^{2}\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2} + 2\left(ABb^{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 11.47, size = 1501, normalized size = 5.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/3*A*B*b^2*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*b^2*g^
2*x^3 + 2*A*B*a*b*g^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*b*
g^2*x^2 + 1/3*A*B*b^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*
a*b*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d
)) + 2*A*B*a^2*g^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*a^2*g^2*
x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a^2*g^2*x - 1/3*((3*g^2*n^2
+ 2*g^2*n*log(e))*b^2*c^3 - (7*g^2*n^2 + 6*g^2*n*log(e))*a*b*c^2*d + 2*(2*g
^2*n^2 + 3*g^2*n*log(e))*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*g^2
*n^2 - 3*a*b^2*c^2*d*g^2*n^2 + 3*a^2*b*c*d^2*g^2*n^2 - a^3*d^3*g^2*n^2)*(lo
```

```
g(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c -
 a*d)))*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 - B^2*a^3*d^3*g^2*n
^2*log(b*x + a)^2 - (b^3*c*d^2*g^2*n*log(e) - (g^2*n*log(e) + 3*g^2*log(e)^
2)*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^3*g^2*n^2 - 3*a*b^2*c^2*d*g^2*n^2 + 3*a^2*
b*c*d^2*g^2*n^2)*B^2*log(b*x + a)*log(d*x + c) - (b^3*c^3*g^2*n^2 - 3*a*b^2
*c^2*d*g^2*n^2 + 3*a^2*b*c*d^2*g^2*n^2)*B^2*log(d*x + c)^2 + ((g^2*n^2 + 2*
g^2*n*log(e))*b^3*c^2*d - 2*(g^2*n^2 + 3*g^2*n*log(e))*a*b^2*c*d^2 + (g^2*n
^2 + 4*g^2*n*log(e) + 3*g^2*log(e)^2)*a^2*b*d^3)*B^2*x + (2*a*b^2*c^2*d*g^2
*n^2 - 5*a^2*b*c*d^2*g^2*n^2 + (3*g^2*n^2 + 2*g^2*n*log(e))*a^3*d^3)*B^2*lo
g(b*x + a) + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d
^3*g^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x
^2 + 3*B^2*a^2*b*d^3*g^2*x)*log((d*x + c)^n)^2 + (2*B^2*b^3*d^3*g^2*x^3*log
(e) + 2*B^2*a^3*d^3*g^2*n*log(b*x + a) - (b^3*c*d^2*g^2*n - (g^2*n + 6*g^2*
log(e))*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d*g^2*n - 3*a*b^2*c*d^2*g^2*n + (2*
g^2*n + 3*g^2*log(e))*a^2*b*d^3)*B^2*x - 2*(b^3*c^3*g^2*n - 3*a*b^2*c^2*d*g
^2*n + 3*a^2*b*c*d^2*g^2*n)*B^2*log(d*x + c))*log((b*x + a)^n) - (2*B^2*b^3
*d^3*g^2*x^3*log(e) + 2*B^2*a^3*d^3*g^2*n*log(b*x + a) - (b^3*c*d^2*g^2*n -
 (g^2*n + 6*g^2*log(e))*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d*g^2*n - 3*a*b^2*c
*d^2*g^2*n + (2*g^2*n + 3*g^2*log(e))*a^2*b*d^3)*B^2*x - 2*(b^3*c^3*g^2*n -
 3*a*b^2*c^2*d*g^2*n + 3*a^2*b*c*d^2*g^2*n)*B^2*log(d*x + c) + 2*(B^2*b^3*d
^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x)*log((b*x + a)
^n))*log((d*x + c)^n))/(b*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g+b g x\right)^2 \left(A+B \ln\left(e \left(\frac{a+b x}{c+d x}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.13 $\int (ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=196

$$-\frac{Bgn(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A+Bn\right)}{bd^2}-\frac{Bgn(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bd}+$$

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

Rubi [A] time = 0.44, antiderivative size = 309, normalized size of antiderivative = 1.58, number of steps used = 15, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2gn^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}+\frac{Bgn(bc-ad)^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bd^2}+$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 31

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2486

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

Rule 2524

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

Rule 2525

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

Rule 2528

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

Rubi steps

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

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

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

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

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

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g}{}$$

Mathematica [**A**] time = 0.20, size = 215, normalized size = 1.10

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

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.94, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\left(ABbgx+ABag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

maple [F] time = 0.12, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 7.48, size = 828, normalized size = 4.22

$$ABbgx^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{2}A^2bgx^2-ABbgn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+2\,ABag$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

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

```
*n - (g*n + 2*g*log(e))*a*b*d^2)*B^2*x + (b^2*c^2*g*n - 2*a*b*c*d*g*n)*B^2*
log(d*x + c) + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x)*log((b*x + a)^n))*lo
g((d*x + c)^n))/(b*d^2)
```

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

$$\int \left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.14 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=138

$$\frac{2Bn\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{bg}+\frac{2B^2n^2\text{Li}_3\left(\frac{b(c+dx)}{d(a+bx)}\right)}{bg}$$

```
[Out] -(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b/g+2*B*n*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,b*(d*x+c)/d/(b*x+a))/b/g+2*B^2*n^2*po
lylog(3,b*(d*x+c)/d/(b*x+a))/b/g
```

Rubi [B] time = 3.57, antiderivative size = 789, normalized size of antiderivative = 5.72, number of steps used = 45, number of rules used = 23, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.657$, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396}

$$\frac{2ABn\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}-\frac{2B^2n\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\log\left((a+bx)^n\right)+\log\left((c+dx)^{-n}\right)\right)}{bg}$$

Antiderivative was successfully verified.

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

```
[Out] -((A*B*n*Log[g*(a + b*x)]^2)/(b*g)) + (B^2*n^2*Log[g*(a + b*x)]^3)/(3*b*g)
- (B^2*n^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b*g) + (2*B^2*n*Log[g*(a + b*
x)]*Log[(a + b*x)^n]*Log[-c - d*x])/(b*g) - (B^2*Log[(a + b*x)^n]^2*Log[-c
- d*x])/(b*g) + (B^2*n^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])
/(b*g) + (B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g) + (B
^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(b*g) - (B^2*Lo
g[g*(a + b*x)]*Log[(c + d*x)^(-n)]^2)/(b*g) + ((A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2*Log[a*g + b*g*x])/(b*g) + (2*A*B*n*Log[(b*(c + d*x))/(b*c - a*
d)]*Log[a*g + b*g*x])/(b*g) - (2*B^2*n*Log[(b*(c + d*x))/(b*c - a*d)]*(Log[
(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*Log[a*
g + b*g*x])/(b*g) - (B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[a*g + b*g*x]^
2)/(b*g) - (B^2*n^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g
) + (2*A*B*n*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (2*B^2*n*Log
[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*n*(L
og[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*Pol
yLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*n*Log[(c + d*x)^(-n)]
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) - (2*B^2*n^2*PolyLog[3, -((d*
(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c
- a*d)])/(b*g)
```

Rule 12

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

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2301

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

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2396

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

Rule 2418

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

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

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

Rule 2528

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

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

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

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

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

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

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2Bn)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(ag+bgx)}{a+bx}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2Bn)\int\left(\frac{A\log(ag+bgx)}{a+bx}+\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{a+b}\right.}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2ABn)\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g} - \left(2B^2n\right)\int$$

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

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

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{2B^2n\log(g(a+bx))\log\left((a+bx)^n\right)\log(-c-dx)}{bg} - B$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{2B^2n\log(g(a+bx))\log\left((a+bx)^n\right)\log(-c-dx)}{bg} + \frac{B}{}$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{B^2n^2\log^3(g(a+bx))}{3bg} - \frac{B^2n^2\log^2(g(a+bx))\log(-c}{bg}$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{B^2n^2\log^3(g(a+bx))}{3bg} - \frac{B^2n^2\log^2(g(a+bx))\log(-c}{bg}$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{B^2n^2\log^3(g(a+bx))}{3bg} - \frac{B^2n^2\log^2(g(a+bx))\log(-c}{bg}$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{B^2n^2\log^3(g(a+bx))}{3bg} - \frac{B^2n^2\log^2(g(a+bx))\log(-c}{bg}$$

Mathematica [B] time = 0.43, size = 537, normalized size = 3.89

$$3Bn\left(-2\left(\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+\log\left(\frac{c}{d}+x\right)\log\left(\frac{d(a+bx)}{ad-bc}\right)\right)-2\log(a+bx)\left(-\log\left(\frac{a+bx}{c+dx}\right)+\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)\right)$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, algorithm="fric
as")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g),x, algorithm="maxi
ma")
```

```
[Out] B^2*log(b*x + a)*log((d*x + c)^n)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - in
tegrate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log((
b*x + a)^n)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 2*(B^2*b*c*log(e)
 + A*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log((b*x + a)^n) - 2*(B^2*b*c*lo
g(e) + A*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x + (B^2*b*d*n*x + B^2*a*d*n)*l
og(b*x + a) + (B^2*b*d*x + B^2*b*c)*log((b*x + a)^n))*log((d*x + c)^n))/(b^
2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x), x)
```

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

$$\int \frac{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{\int \frac{A^{2}}{a + b x}\, dx + \int \frac{B^{2} \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}^{2}}{a + b x}\, dx + \int \frac{2 A B \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}}{a + b x}\, dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.15 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=136

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

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

Rubi [C] time = 0.84, antiderivative size = 512, normalized size of antiderivative = 3.76, number of steps used = 24, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2524

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

Rule 2525

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

Rule 2528

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

Rubi steps

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

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

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

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{bg^2(a+bx)} + \frac{(2Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(2Bdn)\int \frac{A+B\log}{}}{(bc-a}$$

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

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

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

$$= -\frac{2B^2n^2}{bg^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{b(bc-ad)g^2} - \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bg^2(a+bx)} - \frac{2Bdn}{}$$

$$= -\frac{2B^2n^2}{bg^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2dn^2\log^2(a+bx)}{b(bc-ad)g^2} - \frac{2Bn\left(A+B\,\mathrm{lo}\right.}{bg^2(a}$$

$$= -\frac{2B^2n^2}{bg^2(a+bx)} - \frac{2B^2dn^2\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2dn^2\log^2(a+bx)}{b(bc-ad)g^2} - \frac{2Bn\left(A+B\,\mathrm{lo}\right.}{bg^2(a}$$

Mathematica [C] time = 0.57, size = 330, normalized size = 2.43

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

Antiderivative was successfully verified.

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

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

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

fricas [**A**] time = 0.83, size = 258, normalized size = 1.90

$$-\frac{A^2bc - A^2ad + 2\left(B^2bc - B^2ad\right)n^2 + \left(B^2bc - B^2ad\right)\log(e)^2 + \left(B^2bdn^2x + B^2bcn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^2 + 2\,(ABbc - AB}{(b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, algorithm="fr
icas")
```

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

giac [**A**] time = 7.36, size = 163, normalized size = 1.20

$$-\Bigg(\frac{(dx+c)B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(bx+a)g^2} + \frac{2\left(B^2n^2 + ABn + B^2n\right)(dx+c)\log\left(\frac{bx+a}{dx+c}\right)}{(bx+a)g^2} + \frac{(2\,B^2n^2 + 2\,ABn + 2\,B^2n + A^2 + 2\,A}{(bx+a)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, algorithm="gi
ac")
```

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

maple [**F**] time = 0.27, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [**B**] time = 1.47, size = 430, normalized size = 3.16

$$-2\,ABn\left(\frac{1}{b^2g^2x + abg^2} + \frac{d\log(bx+a)}{\left(b^2c - abd\right)g^2} - \frac{d\log(dx+c)}{\left(b^2c - abd\right)g^2}\right) - \Bigg(2\,n\left(\frac{1}{b^2g^2x + abg^2} + \frac{d\log(bx+a)}{\left(b^2c - abd\right)g^2} - \frac{d\log(dx+c)}{\left(b^2c - abd\right)g^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^2,x, algorithm="ma
xima")
```

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

mupad [B] time = 5.59, size = 238, normalized size = 1.75

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{\int \frac{A^{2}}{a^{2}+2abx+b^{2}x^{2}}\, dx + \int \frac{B^{2}\log{\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}^{2}}{a^{2}+2abx+b^{2}x^{2}}\, dx + \int \frac{2AB\log{\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}}{a^{2}+2abx+b^{2}x^{2}}\, dx}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.16 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=288

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

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

Rubi [C] time = 0.92, antiderivative size = 626, normalized size of antiderivative = 2.17, number of steps used = 28, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{B^2d^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{Bd^2n\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg^3(bc-ad)^2}-\frac{Bd^2n\log}{}$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2524

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

Rule 2525

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

Rule 2528

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

Rubi steps

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

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

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2bg^3(a+bx)^2}+\frac{(B(bc-ad)n)\int\left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(a+bx)^3}-\frac{bd\left(A+B\log(e}{(bc-ad)^2(a}\right.}{}$$

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

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

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

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

$$= -\frac{B^2n^2}{4bg^3(a+bx)^2}+\frac{3B^2dn^2}{2b(bc-ad)g^3(a+bx)}+\frac{3B^2d^2n^2\log(a+bx)}{2b(bc-ad)^2g^3}-\frac{Bn\left(A+B\right.}{2bg^3}$$

$$= -\frac{B^2n^2}{4bg^3(a+bx)^2}+\frac{3B^2dn^2}{2b(bc-ad)g^3(a+bx)}+\frac{3B^2d^2n^2\log(a+bx)}{2b(bc-ad)^2g^3}-\frac{B^2d^2n^2\log^2}{2b(bc-a}$$

$$= -\frac{B^2n^2}{4bg^3(a+bx)^2}+\frac{3B^2dn^2}{2b(bc-ad)g^3(a+bx)}+\frac{3B^2d^2n^2\log(a+bx)}{2b(bc-ad)^2g^3}-\frac{B^2d^2n^2\log^2}{2b(bc-a}$$

Mathematica [C] time = 0.49, size = 463, normalized size = 1.61

$$-\frac{\frac{Bn\left(-4d^2(a+bx)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+4d^2(a+bx)^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+4d(a+bx)(ad-bc)\right.}{}}{}$$

Antiderivative was successfully verified.

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

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

```
a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*n*((b*c - a*d)^2 + 2*d*(-(b*c) + a
*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c +
d*x]) + 2*B*d^2*n*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d
*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*
n*(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c +
 d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(b*g^3*(a
 + b*x)^2)
```

fricas [B] time = 0.86, size = 651, normalized size = 2.26

$$-\frac{2\,A^{2}b^{2}c^{2} - 4\,A^{2}abcd + 2\,A^{2}a^{2}d^{2} + \left(B^{2}b^{2}c^{2} - 8\,B^{2}abcd + 7\,B^{2}a^{2}d^{2}\right)n^{2} + 2\left(B^{2}b^{2}c^{2} - 2\,B^{2}abcd + B^{2}a^{2}d^{2}\right)\log(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/4*(2*A^2*b^2*c^2 - 4*A^2*a*b*c*d + 2*A^2*a^2*d^2 + (B^2*b^2*c^2 - 8*B^2*
a*b*c*d + 7*B^2*a^2*d^2)*n^2 + 2*(B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2
)*log(e)^2 - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*a*b*d^2*n^2*x - (B^2*b^2*c^2 -
2*B^2*a*b*c*d)*n^2)*log((b*x + a)/(d*x + c))^2 + 2*(A*B*b^2*c^2 - 4*A*B*a*b
*c*d + 3*A*B*a^2*d^2)*n - 2*(3*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2 + 2*(A*B*b^2
*c*d - A*B*a*b*d^2)*n)*x + 2*(2*A*B*b^2*c^2 - 4*A*B*a*b*c*d + 2*A*B*a^2*d^2
 - 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n*x + (B^2*b^2*c^2 - 4*B^2*a*b*c*d + 3*B^2
*a^2*d^2)*n - 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x - (B^2*b^2*c^2 - 2*B
^2*a*b*c*d)*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*((B^2*b^2*c^2 - 4*B^2*a
*b*c*d)*n^2 - (3*B^2*b^2*d^2*n^2 + 2*A*B*b^2*d^2*n)*x^2 + 2*(A*B*b^2*c^2 -
2*A*B*a*b*c*d)*n - 2*(2*A*B*a*b*d^2*n + (B^2*b^2*c*d + 2*B^2*a*b*d^2)*n^2)*
x)*log((b*x + a)/(d*x + c)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2
 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3
*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [A] time = 10.43, size = 458, normalized size = 1.59

$$-\frac{1}{4}\left(\frac{2\left(B^{2}bn^{2} - \frac{2\,(bx+a)B^{2}dn^{2}}{dx+c}\right)\log\left(\frac{bx+a}{dx+c}\right)^{2}}{\frac{(bx+a)^{2}bcg^{3}}{(dx+c)^{2}} - \frac{(bx+a)^{2}adg^{3}}{(dx+c)^{2}}} + \frac{2\left(B^{2}bn^{2} - \frac{4\,(bx+a)B^{2}dn^{2}}{dx+c} + 2\,ABbn + 2\,B^{2}bn - \frac{4\,(bx+a)ABdn}{dx+c} - \frac{4\,(bx+a)}{dx+}\right.}{\frac{(bx+a)^{2}bcg^{3}}{(dx+c)^{2}} - \frac{(bx+a)^{2}adg^{3}}{(dx+c)^{2}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, algorithm="gi
ac")
```

```
[Out] -1/4*(2*(B^2*b*n^2 - 2*(b*x + a)*B^2*d*n^2/(d*x + c))*log((b*x + a)/(d*x +
c))^2/((b*x + a)^2*b*c*g^3/(d*x + c)^2 - (b*x + a)^2*a*d*g^3/(d*x + c)^2) +
 2*(B^2*b*n^2 - 4*(b*x + a)*B^2*d*n^2/(d*x + c) + 2*A*B*b*n + 2*B^2*b*n - 4
*(b*x + a)*A*B*d*n/(d*x + c) - 4*(b*x + a)*B^2*d*n/(d*x + c))*log((b*x + a)
/(d*x + c))/((b*x + a)^2*b*c*g^3/(d*x + c)^2 - (b*x + a)^2*a*d*g^3/(d*x + c
)^2) + (B^2*b*n^2 - 8*(b*x + a)*B^2*d*n^2/(d*x + c) + 2*A*B*b*n + 2*B^2*b*n
 - 8*(b*x + a)*A*B*d*n/(d*x + c) - 8*(b*x + a)*B^2*d*n/(d*x + c) + 2*A^2*b
+ 4*A*B*b + 2*B^2*b - 4*(b*x + a)*A^2*d/(d*x + c) - 8*(b*x + a)*A*B*d/(d*x
+ c) - 4*(b*x + a)*B^2*d/(d*x + c))/((b*x + a)^2*b*c*g^3/(d*x + c)^2 - (b*x
 + a)^2*a*d*g^3/(d*x + c)^2))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.74, size = 861, normalized size = 2.99

$$\frac{1}{2}ABn\left(\frac{2bdx-bc+3ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}+\frac{2d^2\log\left(bx+a\right)}{\left(b^3c^2-2ab^2cd+a^2bd^2\right)g^3}-\frac{2d^2\log}{\left(b^3c^2-2ab^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c
- a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*
c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^
2*c*d + a^2*b*d^2)*g^3)) + 1/4*(2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^
3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) +
 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d
*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3))*log(e*(b*x/(d*x + c) + a
/(d*x + c))^n) - (b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*
d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*l
og(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^
2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d
^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^3*c^
2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3
+ a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2
*g^3)*x))*B^2 - 1/2*B^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^3*g^3*x
^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^
2*g^3*x + a^2*b*g^3)
```

mupad [B] time = 6.17, size = 506, normalized size = 1.76

$$-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\,\left(\frac{B^2}{2\,b\,\left(a^2\,g^3+2\,a\,b\,g^3\,x+b^2\,g^3\,x^2\right)}-\frac{B^2\,d^2}{2\,b\,g^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{\frac{2\,A^2\,a\,d-2\,A^2\,b\,c+7\,B^2\,a\,d\,n^2-}{2\,(a}}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(2*b*(a^2*g^3 + b^2*g^3*x^2 + 2*a*b
*g^3*x)) - (B^2*d^2)/(2*b*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((2*A^2*a
*d - 2*A^2*b*c + 7*B^2*a*d*n^2 - B^2*b*c*n^2 + 6*A*B*a*d*n - 2*A*B*b*c*n)/(
2*(a*d - b*c)) + (d*x*(3*B^2*b*n^2 + 2*A*B*b*n))/(a*d - b*c))/(2*a^2*b*g^3
+ 2*b^3*g^3*x^2 + 4*a*b^2*g^3*x) - log(e*((a + b*x)/(c + d*x))^n)*((A*B)/(a
^2*b*g^3 + b^3*g^3*x^2 + 2*a*b^2*g^3*x) + (B^2*d^2*((b*g^3*n*(a*d - b*c)*(2
*a*d - b*c))/(2*d^2) + (b^2*g^3*n*x*(a*d - b*c))/d + (a*b*g^3*n*(a*d - b*c)
)/(2*d)))/(b*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(a^2*b*g^3 + b^3*g^3*x^2 +
 2*a*b^2*g^3*x))) - (B*d^2*n*atan(((2*b*d*x - (2*b^3*c^2*g^3 - 2*a^2*b*d^2*
g^3)/(2*b*g^3*(a*d - b*c)))*1i)/(a*d - b*c))*(2*A + 3*B*n)*1i)/(b*g^3*(a*d
- b*c)^2)
```

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

$$\frac{\int \frac{A^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx + \int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx + \int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^3+3a^2bx+3ab^2x^2+b^3x^3}\,dx}{g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (Integral(A**2/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x) + Integr
al(B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**3 + 3*a**2*b*x + 3*a
*b**2*x**2 + b**3*x**3), x) + Integral(2*A*B*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)/(a**3 + 3*a**2*b*x + 3*a*b**2*x**2 + b**3*x**3), x))/g**3
```

3.17 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=448

$$-\frac{b^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^3}-\frac{2b^2Bn(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{d^2(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}{g^4(a+bx)(bc-ad)^3}$$

```
[Out] -2*B^2*d^2*n^2*(d*x+c)/(-a*d+b*c)^3/g^4/(b*x+a)+1/2*b*B^2*d*n^2*(d*x+c)^2/(
-a*d+b*c)^3/g^4/(b*x+a)^2-2/27*b^2*B^2*n^2*(d*x+c)^3/(-a*d+b*c)^3/g^4/(b*x+
a)^3-2*B*d^2*n*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^4/(b*
x+a)+b*B*d*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^4/(b*
x+a)^2-2/9*b^2*B*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g
^4/(b*x+a)^3-d^2*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^4
/(b*x+a)+b*d*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g^4/(
b*x+a)^2-1/3*b^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^3/g
^4/(b*x+a)^3
```

Rubi [C] time = 1.09, antiderivative size = 736, normalized size of antiderivative = 1.64, number of steps used = 32, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d^3n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2B^2d^3n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2Bd^3n\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3bg^4(bc-ad)^3}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B^2*n^2)/(27*b*g^4*(a + b*x)^3) + (5*B^2*d*n^2)/(18*b*(b*c - a*d)*g^4*(
a + b*x)^2) - (11*B^2*d^2*n^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (11*B^2*
d^3*n^2*Log[a + b*x])/(9*b*(b*c - a*d)^3*g^4) + (B^2*d^3*n^2*Log[a + b*x]^2
)/(3*b*(b*c - a*d)^3*g^4) - (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(9*b*g^4*(a + b*x)^3) + (B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b
*(b*c - a*d)*g^4*(a + b*x)^2) - (2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (2*B*d^3*n*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2/(3*b*g^4*(a + b*x)^3) + (11*B^2*d^3*n^2*Log[c + d*
x])/(9*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (2*B*d^3*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (B^2*d^3*n^2*Log
[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

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

Rule 44

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

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2524

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

Rule 2525

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

Rule 2528

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

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2Bn)\int\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad)n)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad)n)\int\Bigg(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(a+bx)^4}-\frac{bd\Big(A+B\log\Big(}{(bc-ad)^2}}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2Bn)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^4}\,dx}{3g^4}-\frac{\left(2Bd^3n\right)\int\frac{A+B\log\Big(}{a+}}{3(bc-ad)^3}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9bg^4(a+bx)^3}+\frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2n\Big(A+}{3b(bc-a}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9bg^4(a+bx)^3}+\frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2n\Big(A+}{3b(bc-a}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9bg^4(a+bx)^3}+\frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2n\Big(A+}{3b(bc-a}$$

$$= -\frac{2B^2n^2}{27bg^4(a+bx)^3}+\frac{5B^2dn^2}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2n^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b}$$

$$= -\frac{2B^2n^2}{27bg^4(a+bx)^3}+\frac{5B^2dn^2}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2n^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b}$$

$$= -\frac{2B^2n^2}{27bg^4(a+bx)^3}+\frac{5B^2dn^2}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2n^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b}$$

Mathematica [C] time = 0.70, size = 609, normalized size = 1.36

$$-\frac{Bn\left(36d^3(a+bx)^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-36d^3(a+bx)^3\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+36d^2(a+bx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+12(bc-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -1/54*(18*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(12*(b*c - a*d)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/
(c + d*x))^n])*Log[c + d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*
x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d
)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2
*(a + b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a
+ b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6
*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[
a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
))/(b*c - a*d)^3)/(b*g^4*(a + b*x)^3)
```

fricas [**B**]   time = 0.87, size = 1164, normalized size = 2.60

$$-\frac{18\,A^2b^3c^3-54\,A^2ab^2c^2d+54\,A^2a^2bcd^2-18\,A^2a^3d^3+\Big(4\,B^2b^3c^3-27\,B^2ab^2c^2d+108\,B^2a^2bcd^2-85\,B^2a^3d^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/54*(18*A^2*b^3*c^3 - 54*A^2*a*b^2*c^2*d + 54*A^2*a^2*b*c*d^2 - 18*A^2*a^
3*d^3 + (4*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2 - 85*B^2*
a^3*d^3)*n^2 + 6*(11*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6*(A*B*b^3*c*d^2
 - A*B*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*
b*c*d^2 - B^2*a^3*d^3)*log(e)^2 + 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3
*n^2*x^2 + 3*B^2*a^2*b*d^3*n^2*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2
*a^2*b*c*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 + 6*(2*A*B*b^3*c^3 - 9*A*B*a*
b^2*c^2*d + 18*A*B*a^2*b*c*d^2 - 11*A*B*a^3*d^3)*n - 3*((5*B^2*b^3*c^2*d -
54*B^2*a*b^2*c*d^2 + 49*B^2*a^2*b*d^3)*n^2 + 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2
*c*d^2 + 5*A*B*a^2*b*d^3)*n)*x + 6*(6*A*B*b^3*c^3 - 18*A*B*a*b^2*c^2*d + 18
*A*B*a^2*b*c*d^2 - 6*A*B*a^3*d^3 + 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n*x^2
- 3*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*n*x + (2*B^2*b^3*
c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d^2 - 11*B^2*a^3*d^3)*n + 6*(B^2*b
^3*d^3*n*x^3 + 3*B^2*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + (B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*n)*log((b*x + a)/(d*x + c)))*log(e)
 + 6*((11*B^2*b^3*d^3*n^2 + 6*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 9*B^2*a
*b^2*c^2*d + 18*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B*a*b^2*d^3*n + (2*B^2*b^3*c*
d^2 + 9*B^2*a*b^2*d^3)*n^2)*x^2 + 6*(A*B*b^3*c^3 - 3*A*B*a*b^2*c^2*d + 3*A*
B*a^2*b*c*d^2)*n + 3*(6*A*B*a^2*b*d^3*n - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^
2 - 6*B^2*a^2*b*d^3)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^7*c^3 - 3*a*b^6*
c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c
^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*
c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c^2
*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [**A**]   time = 13.07, size = 810, normalized size = 1.81

$$-\frac{1}{54}\left(\frac{18\left(B^2b^2n^2-\frac{3\,(bx+a)B^2bdn^2}{dx+c}+\frac{3\,(bx+a)^2B^2d^2n^2}{(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)^2}{\frac{(bx+a)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bx+a)^3abcdg^4}{(dx+c)^3}+\frac{(bx+a)^3a^2d^2g^4}{(dx+c)^3}}+\frac{6\left(2\,B^2b^2n^2-\frac{9\,(bx+a)B^2bdn^2}{dx+c}+\frac{18\,(bx+a)^2B^2d^2n^2}{(dx+c)^2}+\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, algorithm="gi
ac")
```

```
[Out] -1/54*(18*(B^2*b^2*n^2 - 3*(b*x + a)*B^2*b*d*n^2/(d*x + c) + 3*(b*x + a)^2*
B^2*d^2*n^2/(d*x + c)^2)*log((b*x + a)/(d*x + c))^2/((b*x + a)^3*b^2*c^2*g^
4/(d*x + c)^3 - 2*(b*x + a)^3*a*b*c*d*g^4/(d*x + c)^3 + (b*x + a)^3*a^2*d^2
*g^4/(d*x + c)^3) + 6*(2*B^2*b^2*n^2 - 9*(b*x + a)*B^2*b*d*n^2/(d*x + c) +
18*(b*x + a)^2*B^2*d^2*n^2/(d*x + c)^2 + 6*A*B*b^2*n + 6*B^2*b^2*n - 18*(b*
x + a)*A*B*b*d*n/(d*x + c) - 18*(b*x + a)*B^2*b*d*n/(d*x + c) + 18*(b*x + a
)^2*A*B*d^2*n/(d*x + c)^2 + 18*(b*x + a)^2*B^2*d^2*n/(d*x + c)^2)*log((b*x
+ a)/(d*x + c))/((b*x + a)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x + a)^3*a*b*c*
d*g^4/(d*x + c)^3 + (b*x + a)^3*a^2*d^2*g^4/(d*x + c)^3) + (4*B^2*b^2*n^2 -
 27*(b*x + a)*B^2*b*d*n^2/(d*x + c) + 108*(b*x + a)^2*B^2*d^2*n^2/(d*x + c)
^2 + 12*A*B*b^2*n + 12*B^2*b^2*n - 54*(b*x + a)*A*B*b*d*n/(d*x + c) - 54*(b
*x + a)*B^2*b*d*n/(d*x + c) + 108*(b*x + a)^2*A*B*d^2*n/(d*x + c)^2 + 108*(
b*x + a)^2*B^2*d^2*n/(d*x + c)^2 + 18*A^2*b^2 + 36*A*B*b^2 + 18*B^2*b^2 - 5
4*(b*x + a)*A^2*b*d/(d*x + c) - 108*(b*x + a)*A*B*b*d/(d*x + c) - 54*(b*x +
 a)*B^2*b*d/(d*x + c) + 54*(b*x + a)^2*A^2*d^2/(d*x + c)^2 + 108*(b*x + a)^
2*A*B*d^2/(d*x + c)^2 + 54*(b*x + a)^2*B^2*d^2/(d*x + c)^2)/((b*x + a)^3*b^
2*c^2*g^4/(d*x + c)^3 - 2*(b*x + a)^3*a*b*c*d*g^4/(d*x + c)^3 + (b*x + a)^3
*a^2*d^2*g^4/(d*x + c)^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(b*g*x+a*g)^4,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(b*g*x+a*g)^4,x)
```

maxima [B] time = 2.34, size = 1432, normalized size = 3.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, algorithm="ma
xima")
```

```
[Out] -1/9*A*B*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*
d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5
*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*
d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6
*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*
g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3
*b*d^3)*g^4)) - 1/54*(6*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*
d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4
*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2
 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*
b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^
2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*
b^2*c*d^2 - a^3*b*d^3)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (4*b^
3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b
^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*
log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^
3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*
(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*
```

```
(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d
^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x +
 c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6
*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b
^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*
g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a
^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2 - 1/3*B^2*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n)^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*
b*g^4) - 2/3*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*
b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3
*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

mupad [B] time = 7.69, size = 1038, normalized size = 2.32

$$\frac{\frac{18\,A^2\,a^2\,d^2-36\,A^2\,a\,b\,c\,d+18\,A^2\,b^2\,c^2+66\,A\,B\,a^2\,d^2\,n-42\,A\,B\,a\,b\,c\,d\,n+12\,A\,B\,b^2\,c^2\,n+85\,B^2\,a^2\,d^2\,n^2-23\,B^2\,a\,b\,c\,d\,n^2+4\,B^2\,b^2\,c^2\,n^2}{6\,(a\,d-b\,c)}+\frac{x\,(-5\,c\,B^2\,b^2}{}}{x\,\left(27\,a^2\,b^3\,c\,g^4-27\,a^3\,b^2\,d\,g^4\right)-x^2\,\left(27\,a^2\,b^3\,d\,g^4-27\,a\,b^4\,c\,g^4\right)+x^3\,(9\,b^5\,c\,g^4-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(a*g + b*g*x)^4,x)
```

```
[Out] ((18*A^2*a^2*d^2 + 18*A^2*b^2*c^2 + 85*B^2*a^2*d^2*n^2 + 4*B^2*b^2*c^2*n^2
- 36*A^2*a*b*c*d + 66*A*B*a^2*d^2*n + 12*A*B*b^2*c^2*n - 23*B^2*a*b*c*d*n^2
 - 42*A*B*a*b*c*d*n)/(6*(a*d - b*c)) + (x*(49*B^2*a*b*d^2*n^2 - 5*B^2*b^2*c
*d*n^2 + 30*A*B*a*b*d^2*n - 6*A*B*b^2*c*d*n))/(2*(a*d - b*c)) + (d*x^2*(11*
B^2*b^2*d*n^2 + 6*A*B*b^2*d*n))/(a*d - b*c))/(x*(27*a^2*b^3*c*g^4 - 27*a^3*
b^2*d*g^4) - x^2*(27*a^2*b^3*d*g^4 - 27*a*b^4*c*g^4) + x^3*(9*b^5*c*g^4 - 9
*a*b^4*d*g^4) + 9*a^3*b^2*c*g^4 - 9*a^4*b*d*g^4) - log(e*((a + b*x)/(c + d*
x))^n)*((2*A*B)/(3*a^3*b*g^4 + 3*b^4*g^4*x^3 + 9*a^2*b^2*g^4*x + 9*a*b^3*g^
4*x^2) + (2*B^2*d^3*(x*(b*((b*g^4*n*(a*d - b*c)*(3*a*d - b*c))/(2*d^2) + (a
*b*g^4*n*(a*d - b*c))/d) + (2*a*b^2*g^4*n*(a*d - b*c))/d + (b^2*g^4*n*(a*d
- b*c)*(3*a*d - b*c))/d^2) + a*((b*g^4*n*(a*d - b*c)*(3*a*d - b*c))/(2*d^2)
 + (a*b*g^4*n*(a*d - b*c))/d) + (b*g^4*n*(a*d - b*c)*(3*a^2*d^2 + b^2*c^2 -
 3*a*b*c*d))/d^3 + (3*b^3*g^4*n*x^2*(a*d - b*c))/d))/(3*b*g^4*(a^3*d^3 - b^
3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)*(3*a^3*b*g^4 + 3*b^4*g^4*x^3 + 9*a^2
*b^2*g^4*x + 9*a*b^3*g^4*x^2))) - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(3*
b*(a^3*g^4 + b^3*g^4*x^3 + 3*a*b^2*g^4*x^2 + 3*a^2*b*g^4*x)) - (B^2*d^3)/(3
*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (B*d^3*n*ata
n((B*d^3*n*(6*A + 11*B*n)*((b^4*c^3*g^4 + a^3*b*d^3*g^4 - a*b^3*c^2*d*g^4 -
 a^2*b^2*c*d^2*g^4)/(b^3*c^2*g^4 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4) + 2*b*d
*x)*(b^3*c^2*g^4 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4)*1i)/(b*g^4*(11*B^2*d^3*
n^2 + 6*A*B*d^3*n)*(a*d - b*c)^3))*(6*A + 11*B*n)*2i)/(9*b*g^4*(a*d - b*c)^
3)
```

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

$$\frac{\int \frac{A^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx+\int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{a^4+4a^3bx+6a^2b^2x^2+4ab^3x^3+b^4x^4}\,dx}{g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**4,x)
```

```
[Out] (Integral(A**2/(a**4 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4
*x**4), x) + Integral(B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(a**4
 + 4*a**3*b*x + 6*a**2*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x) + Integra
```

```
l(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(a**4 + 4*a**3*b*x + 6*a**2
*b**2*x**2 + 4*a*b**3*x**3 + b**4*x**4), x))/g**4
```

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

Optimal. Leaf size=615

$$-\frac{b^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^4}-\frac{b^3Bn(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{g^5(a+bx)^3(bc-ad)^4}$$

```
[Out] 2*B^2*d^3*n^2*(d*x+c)/(-a*d+b*c)^4/g^5/(b*x+a)-3/4*b*B^2*d^2*n^2*(d*x+c)^2/
(-a*d+b*c)^4/g^5/(b*x+a)^2+2/9*b^2*B^2*d*n^2*(d*x+c)^3/(-a*d+b*c)^4/g^5/(b*
x+a)^3-1/32*b^3*B^2*n^2*(d*x+c)^4/(-a*d+b*c)^4/g^5/(b*x+a)^4+2*B*d^3*n*(d*x
+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(b*x+a)-3/2*b*B*d^2*n*
(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(b*x+a)^2+2/3*b^
2*B*d*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(b*x+a)^
3-1/8*b^3*B*n*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(b
*x+a)^4+d^3*(d*x+c)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^5/(b*x
+a)-3/2*b*d^2*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^5/
(b*x+a)^2+b^2*d*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^4/g^
5/(b*x+a)^3-1/4*b^3*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^
4/g^5/(b*x+a)^4
```

Rubi [C] time = 1.31, antiderivative size = 826, normalized size of antiderivative = 1.34, number of steps used = 36, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2n^2\log^2(a+bx)d^4}{4b(bc-ad)^4g^5}-\frac{B^2n^2\log^2(c+dx)d^4}{4b(bc-ad)^4g^5}+\frac{25B^2n^2\log(a+bx)d^4}{24b(bc-ad)^4g^5}+\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b(bc-ad)^4g^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -(B^2*n^2)/(32*b*g^5*(a + b*x)^4) + (7*B^2*d*n^2)/(72*b*(b*c - a*d)*g^5*(a
+ b*x)^3) - (13*B^2*d^2*n^2)/(48*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2
*d^3*n^2)/(24*b*(b*c - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*n^2*Log[a + b*x]
)/(24*b*(b*c - a*d)^4*g^5) - (B^2*d^4*n^2*Log[a + b*x]^2)/(4*b*(b*c - a*d)^
4*g^5) - (B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(8*b*g^5*(a + b*x)^4)
 + (B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*(b*c - a*d)*g^5*(a +
 b*x)^3) - (B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b*(b*c - a*d
)^2*g^5*(a + b*x)^2) + (B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
b*(b*c - a*d)^3*g^5*(a + b*x)) + (B*d^4*n*Log[a + b*x]*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2/(4*b*g^5*(a + b*x)^4) - (25*B^2*d^4*n^2*Log[c + d*x])/(24*b*(b*
c - a*d)^4*g^5) + (B^2*d^4*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(2*b*(b*c - a*d)^4*g^5) - (B*d^4*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B^2*d^4*n^2*Log[c + d*x]^2)/(4*
b*(b*c - a*d)^4*g^5) + (B^2*d^4*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*n^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*n^2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5)
```

Rule 12

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

Rule 44

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2524

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

Rule 2525

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

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

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

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5(c+dx)}\,dx}{2bg^5}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad)n)\int\left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(a+bx)^5} - \frac{bd\left(A+B\,\mathrm{lo}\right.}{(bc-a}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5}\,dx}{2g^5} + \frac{\left(Bd^4n\right)\int \frac{A+B\log\left(\right.}{a}}{2(bc-ad}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8bg^5(a+bx)^4} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n\left(A+\right.}{4b(bc-a}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8bg^5(a+bx)^4} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n\left(A+\right.}{4b(bc-a}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8bg^5(a+bx)^4} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n\left(A+\right.}{4b(bc-a}$$

$$= -\frac{B^2n^2}{32bg^5(a+bx)^4} + \frac{7B^2dn^2}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2n^2}{48b(bc-ad)^2g^5(a+bx)^2} +$$

$$= -\frac{B^2n^2}{32bg^5(a+bx)^4} + \frac{7B^2dn^2}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2n^2}{48b(bc-ad)^2g^5(a+bx)^2} +$$

$$= -\frac{B^2n^2}{32bg^5(a+bx)^4} + \frac{7B^2dn^2}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2n^2}{48b(bc-ad)^2g^5(a+bx)^2} +$$

Mathematica [C] time = 1.02, size = 776, normalized size = 1.26

$$-\frac{Bn\left(-144d^4(a+bx)^4\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+144d^4(a+bx)^4\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+144d^3(a+bx)^3(ad-bc)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -1/288*(72*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(36*(b*c - a*d)^
4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*d +
 d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n*(a + b*x
)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a
 + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(b*c - a*d
)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(
a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*(3*(b*c -
 a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2
+ 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*
d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*x]*(Log[a
 + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
)/(b*c - a*d)^4)/(b*g^5*(a + b*x)^4)
```

fricas [B] time = 1.08, size = 1762, normalized size = 2.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/288*(72*A^2*b^4*c^4 - 288*A^2*a*b^3*c^3*d + 432*A^2*a^2*b^2*c^2*d^2 - 28
8*A^2*a^3*b*c*d^3 + 72*A^2*a^4*d^4 - 12*(25*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)
*n^2 + 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 + (9*B^2*b^4*c^4 - 64*B^2*
a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 576*B^2*a^3*b*c*d^3 + 415*B^2*a^4*d
^4)*n^2 + 6*((13*B^2*b^4*c^2*d^2 - 176*B^2*a*b^3*c*d^3 + 163*B^2*a^2*b^2*d^
4)*n^2 + 12*(A*B*b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*n)*x^
2 + 72*(B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3
*b*c*d^3 + B^2*a^4*d^4)*log(e)^2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^
4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n^2*x^2 + 4*B^2*a^3*b*d^4*n^2*x - (B^2*b^4*c^
4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n^2)*log
((b*x + a)/(d*x + c))^2 + 12*(3*A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 36*A*B*a
^2*b^2*c^2*d^2 - 48*A*B*a^3*b*c*d^3 + 25*A*B*a^4*d^4)*n - 4*((7*B^2*b^4*c^3
*d - 60*B^2*a*b^3*c^2*d^2 + 324*B^2*a^2*b^2*c*d^3 - 271*B^2*a^3*b*d^4)*n^2
+ 12*(A*B*b^4*c^3*d - 6*A*B*a*b^3*c^2*d^2 + 18*A*B*a^2*b^2*c*d^3 - 13*A*B*a
^3*b*d^4)*n)*x + 12*(12*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 72*A*B*a^2*b^2*c
^2*d^2 - 48*A*B*a^3*b*c*d^3 + 12*A*B*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*a*b^
3*d^4)*n*x^3 + 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d^4)*
n*x^2 - 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 - 13*
B^2*a^3*b*d^4)*n*x + (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c
^2*d^2 - 48*B^2*a^3*b*c*d^3 + 25*B^2*a^4*d^4)*n - 12*(B^2*b^4*d^4*n*x^4 + 4
*B^2*a*b^3*d^4*n*x^3 + 6*B^2*a^2*b^2*d^4*n*x^2 + 4*B^2*a^3*b*d^4*n*x - (B^2
*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n
)*log((b*x + a)/(d*x + c)))*log(e) - 12*((25*B^2*b^4*d^4*n^2 + 12*A*B*b^4*d
^4*n)*x^4 + 4*(12*A*B*a*b^3*d^4*n + (3*B^2*b^4*c*d^3 + 22*B^2*a*b^3*d^4)*n^
2)*x^3 - (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c^2*d^2 - 48*
B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B*a^2*b^2*d^4*n - (B^2*b^4*c^2*d^2 - 8*B^2*a
*b^3*c*d^3 - 18*B^2*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B*b^4*c^4 - 4*A*B*a*b^3*c
^3*d + 6*A*B*a^2*b^2*c^2*d^2 - 4*A*B*a^3*b*c*d^3)*n + 4*(12*A*B*a^3*b*d^4*n
```

```
 + (B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 + 12*B^2*a^3
*b*d^4)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2
*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^
2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 +
6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^
6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 -
 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*
a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

giac [A] time = 17.90, size = 1166, normalized size = 1.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, algorithm="gi
ac")
```

```
[Out] -1/288*(72*(B^2*b^3*n^2 - 4*(b*x + a)*B^2*b^2*d*n^2/(d*x + c) + 6*(b*x + a)
^2*B^2*b*d^2*n^2/(d*x + c)^2 - 4*(b*x + a)^3*B^2*d^3*n^2/(d*x + c)^3)*log((
b*x + a)/(d*x + c))^2/((b*x + a)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x + a)^4*
a*b^2*c^2*d*g^5/(d*x + c)^4 + 3*(b*x + a)^4*a^2*b*c*d^2*g^5/(d*x + c)^4 - (
b*x + a)^4*a^3*d^3*g^5/(d*x + c)^4) + 12*(3*B^2*b^3*n^2 - 16*(b*x + a)*B^2*
b^2*d*n^2/(d*x + c) + 36*(b*x + a)^2*B^2*b*d^2*n^2/(d*x + c)^2 - 48*(b*x +
a)^3*B^2*d^3*n^2/(d*x + c)^3 + 12*A*B*b^3*n + 12*B^2*b^3*n - 48*(b*x + a)*A
*B*b^2*d*n/(d*x + c) - 48*(b*x + a)*B^2*b^2*d*n/(d*x + c) + 72*(b*x + a)^2*
A*B*b*d^2*n/(d*x + c)^2 + 72*(b*x + a)^2*B^2*b*d^2*n/(d*x + c)^2 - 48*(b*x
+ a)^3*A*B*d^3*n/(d*x + c)^3 - 48*(b*x + a)^3*B^2*d^3*n/(d*x + c)^3)*log((b
*x + a)/(d*x + c))/((b*x + a)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x + a)^4*a*b
^2*c^2*d*g^5/(d*x + c)^4 + 3*(b*x + a)^4*a^2*b*c*d^2*g^5/(d*x + c)^4 - (b*x
 + a)^4*a^3*d^3*g^5/(d*x + c)^4) + (9*B^2*b^3*n^2 - 64*(b*x + a)*B^2*b^2*d*
n^2/(d*x + c) + 216*(b*x + a)^2*B^2*b*d^2*n^2/(d*x + c)^2 - 576*(b*x + a)^3
*B^2*d^3*n^2/(d*x + c)^3 + 36*A*B*b^3*n + 36*B^2*b^3*n - 192*(b*x + a)*A*B*
b^2*d*n/(d*x + c) - 192*(b*x + a)*B^2*b^2*d*n/(d*x + c) + 432*(b*x + a)^2*A
*B*b*d^2*n/(d*x + c)^2 + 432*(b*x + a)^2*B^2*b*d^2*n/(d*x + c)^2 - 576*(b*x
 + a)^3*A*B*d^3*n/(d*x + c)^3 - 576*(b*x + a)^3*B^2*d^3*n/(d*x + c)^3 + 72*
A^2*b^3 + 144*A*B*b^3 + 72*B^2*b^3 - 288*(b*x + a)*A^2*b^2*d/(d*x + c) - 57
6*(b*x + a)*A*B*b^2*d/(d*x + c) - 288*(b*x + a)*B^2*b^2*d/(d*x + c) + 432*(
b*x + a)^2*A^2*b*d^2/(d*x + c)^2 + 864*(b*x + a)^2*A*B*b*d^2/(d*x + c)^2 +
432*(b*x + a)^2*B^2*b*d^2/(d*x + c)^2 - 288*(b*x + a)^3*A^2*d^3/(d*x + c)^3
 - 576*(b*x + a)^3*A*B*d^3/(d*x + c)^3 - 288*(b*x + a)^3*B^2*d^3/(d*x + c)^
3)/((b*x + a)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x + a)^4*a*b^2*c^2*d*g^5/(d*
x + c)^4 + 3*(b*x + a)^4*a^2*b*c*d^2*g^5/(d*x + c)^4 - (b*x + a)^4*a^3*d^3*
g^5/(d*x + c)^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\left(B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(bgx+ag\right)^{5}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(b*g*x+a*g)^5,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(b*g*x+a*g)^5,x)
```

maxima [B] time = 2.98, size = 2136, normalized size = 3.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, algorithm="ma
xima")
```

```
[Out] 1/24*A*B*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^
2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d
^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*
d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2
*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^
4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) + 1/288*(1
2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3
*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*
a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^
5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5
*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^
5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g
^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) +
 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*
b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d
 + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(e*(b*x/(d*x +
 c) + a/(d*x + c))^n) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 -
 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^
4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*
b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 +
 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^
4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d
^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*
x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^
3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^
4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(
b*x + a))*log(d*x + c))*n^2/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*
b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*
b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g
^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 - 1/4*B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 +
4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/2*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n)/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a
^4*b*g^5) - 1/4*A^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*
a^3*b^2*g^5*x + a^4*b*g^5)
```

mupad [B] time = 9.22, size = 1769, normalized size = 2.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(a*g + b*g*x)^5,x)
```

```
[Out] (B*d^4*n*atan((B*d^4*n*(12*A + 25*B*n)*(24*b^5*c^4*g^5 - 24*a^4*b*d^4*g^5 -
 48*a*b^4*c^3*d*g^5 + 48*a^3*b^2*c*d^3*g^5)*1i)/(24*b*g^5*(25*B^2*d^4*n^2 +
 12*A*B*d^4*n)*(a*d - b*c)^4) + (B*d^5*n*x*(12*A + 25*B*n)*(b^4*c^3*g^5 - a
^3*b*d^3*g^5 - 3*a*b^3*c^2*d*g^5 + 3*a^2*b^2*c*d^2*g^5)*2i)/(g^5*(25*B^2*d^
```

```
4*n^2 + 12*A*B*d^4*n)*(a*d - b*c)^4))*(12*A + 25*B*n)*1i)/(12*b*g^5*(a*d -
b*c)^4) - ((72*A^2*a^3*d^3 - 72*A^2*b^3*c^3 + 415*B^2*a^3*d^3*n^2 - 9*B^2*b
^3*c^3*n^2 + 216*A^2*a*b^2*c^2*d - 216*A^2*a^2*b*c*d^2 + 300*A*B*a^3*d^3*n
- 36*A*B*b^3*c^3*n + 55*B^2*a*b^2*c^2*d*n^2 - 161*B^2*a^2*b*c*d^2*n^2 + 156
*A*B*a*b^2*c^2*d*n - 276*A*B*a^2*b*c*d^2*n)/(12*(a*d - b*c)) + (x^2*(163*B^
2*a*b^2*d^3*n^2 - 13*B^2*b^3*c*d^2*n^2 + 84*A*B*a*b^2*d^3*n - 12*A*B*b^3*c*
d^2*n))/(2*(a*d - b*c)) + (x*(271*B^2*a^2*b*d^3*n^2 + 7*B^2*b^3*c^2*d*n^2 -
 53*B^2*a*b^2*c*d^2*n^2 + 156*A*B*a^2*b*d^3*n + 12*A*B*b^3*c^2*d*n - 60*A*B
*a*b^2*c*d^2*n))/(3*(a*d - b*c)) + (d*x^3*(25*B^2*b^3*d^2*n^2 + 12*A*B*b^3*
d^2*n))/(a*d - b*c))/(x*(96*a^3*b^4*c^2*g^5 + 96*a^5*b^2*d^2*g^5 - 192*a^4*
b^3*c*d*g^5) + x^3*(96*a*b^6*c^2*g^5 + 96*a^3*b^4*d^2*g^5 - 192*a^2*b^5*c*d
*g^5) + x^4*(24*b^7*c^2*g^5 + 24*a^2*b^5*d^2*g^5 - 48*a*b^6*c*d*g^5) + x^2*
(144*a^2*b^5*c^2*g^5 + 144*a^4*b^3*d^2*g^5 - 288*a^3*b^4*c*d*g^5) + 24*a^6*
b*d^2*g^5 + 24*a^4*b^3*c^2*g^5 - 48*a^5*b^2*c*d*g^5) - log(e*((a + b*x)/(c
+ d*x))^n)^2*(B^2/(4*b*(a^4*g^5 + b^4*g^5*x^4 + 4*a*b^3*g^5*x^3 + 6*a^2*b^2
*g^5*x^2 + 4*a^3*b*g^5*x)) - (B^2*d^4)/(4*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*
b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - log(e*((a + b*x)/(c + d*x)
)^n)*((A*B)/(2*a^4*b*g^5 + 2*b^5*g^5*x^4 + 8*a^3*b^2*g^5*x + 8*a*b^4*g^5*x^
3 + 12*a^2*b^3*g^5*x^2) + (B^2*d^4*(x*(b*(a*((b*g^5*n*(a*d - b*c)*(4*a*d -
b*c))/(6*d^2) + (a*b*g^5*n*(a*d - b*c))/(2*d)) + (b*g^5*n*(a*d - b*c)*(6*a^
2*d^2 + b^2*c^2 - 4*a*b*c*d))/(6*d^3)) + a*(b*((b*g^5*n*(a*d - b*c)*(4*a*d
- b*c))/(6*d^2) + (a*b*g^5*n*(a*d - b*c))/(2*d)) + (a*b^2*g^5*n*(a*d - b*c)
)/d + (b^2*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(3*d^2)) + (b^2*g^5*n*(a*d - b*
c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + a*(a*((b*g^5*n*(a*d - b*c)
*(4*a*d - b*c))/(6*d^2) + (a*b*g^5*n*(a*d - b*c))/(2*d)) + (b*g^5*n*(a*d -
b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(6*d^3)) + x^2*(b*(b*((b*g^5*n*(a*d
 - b*c)*(4*a*d - b*c))/(6*d^2) + (a*b*g^5*n*(a*d - b*c))/(2*d)) + (a*b^2*g^
5*n*(a*d - b*c))/d + (b^2*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(3*d^2)) + (3*a*
b^3*g^5*n*(a*d - b*c))/(2*d) + (b^3*g^5*n*(a*d - b*c)*(4*a*d - b*c))/(2*d^2
)) + (2*b^4*g^5*n*x^3*(a*d - b*c))/d + (b*g^5*n*(a*d - b*c)*(4*a^3*d^3 - b^
3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/(2*d^4)))/(2*b*g^5*(2*a^4*b*g^5 + 2
*b^5*g^5*x^4 + 8*a^3*b^2*g^5*x + 8*a*b^4*g^5*x^3 + 12*a^2*b^3*g^5*x^2)*(a^4
*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

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

Optimal. Leaf size=38

$$\text{Int}\left(\frac{(ag+bgx)^2}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

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

Verification is Not applicable to the result.

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

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

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{2abg^2x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{b^2g^2x^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(b^2g^2\right.\end{aligned}$$

Mathematica [A] time = 0.77, size = 0, normalized size = 0.00

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

Verification is Not applicable to the result.

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

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

fricas [A] time = 0.88, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

maple [**A**] time = 0.26, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(a\,g+b\,g\,x\right)^{2}}{A+B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^{n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$g^{2}\left(\int \frac{a^{2}}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx+\int \frac{b^{2}x^{2}}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx+\int \frac{2abx}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] g**2*(Integral(a**2/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x) + I
ntegral(b**2*x**2/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x) + Int
egral(2*a*b*x/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x))
```

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

Optimal. Leaf size=36

$$\text{Int}\left(\frac{ag+bgx}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

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

Verification is Not applicable to the result.

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

```
[Out] a*g*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + b*g*Defer[
Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{bgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= (ag)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.30, size = 0, normalized size = 0.00

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

Verification is Not applicable to the result.

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

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

fricas [A] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

maple [A] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [A] time = 0.00, size = -1, normalized size = -0.03

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.21 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=38

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

fricas [A] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log(e*((b*x + a)/(d*x + c))
^n)), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] Timed out
```

maple [A] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

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

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

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

$$\frac{\int \frac{1}{Aa+Abx+Ba\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)+Bbx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral(1/(A*a + A*b*x + B*a*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B*b
*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x)/g
```

3.22 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=94

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

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

Rubi [F] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.17, size = 94, normalized size = 1.00

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

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

fricas [A] time = 0.90, size = 62, normalized size = 0.66

$$\frac{e^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)}{(Bbc-Bad)g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple **[F]** time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

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

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

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

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

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

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

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

$$\frac{\int \frac{1}{Aa^{2}+2Aabx+Ab^{2}x^{2}+Ba^{2}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)+2Babx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)+Bb^{2}x^{2}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral(1/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(e*(a/(c + d*x) +
b*x/(c + d*x))**n) + 2*B*a*b*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B*
b**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x)/g**2
```

3.23 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=197

$$\frac{be^{\frac{2A}{Bn}}(c+dx)^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bg^3n(a+bx)^2(bc-ad)^2}-\frac{de^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^3n(a+bx)(bc-ad)^2}$$

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

Rubi [F] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.33, size = 172, normalized size = 0.87

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(be^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)-d(a+bx)\operatorname{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)\right)}{Bg^3n(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

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

fricas [A] time = 0.95, size = 149, normalized size = 0.76

$$-\frac{de^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)-be^{\left(\frac{2\left(B\log(e)+A\right)}{Bn}\right)}\operatorname{log\_integral}\left(\frac{\left(d^2x^2+2\,cdx+c^2\right)e^{\left(-\frac{2\left(B\log(e)+A\right)}{Bn}\right)}}{b^2x^2+2\,abx+a^2}\right)}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)g^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

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

$$\int \frac{1}{{\left(bgx+ag\right)}^{3}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

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

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

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

3.24 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=38

$$\mathrm{Int}\left(\frac{(ag+bgx)^2}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.24, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

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

Verification is Not applicable to the result.

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

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + 2*a*b*
g^2*Defer[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x] + b^2*g^2*Def
er[Int][x^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{b^2g^2x}{\left(A+B\log\left(e\left(\right.\right.\right.}\right.\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}\end{aligned}$$

Mathematica [A] time = 1.05, size = 0, normalized size = 0.00

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

Verification is Not applicable to the result.

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

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

fricas [A] time = 0.76, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

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

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

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

maple [**A**] time = 0.26, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{b^3dg^2x^4 + a^3cg^2 + \left(b^3cg^2 + 3\,ab^2dg^2\right)x^3 + 3\left(ab^2cg^2 + a^2bdg^2\right)x^2 + \left(3\,a^2bcg^2 + a^3dg^2\right)x}{(bcn - adn)B^2\log\left((bx+a)^n\right) - (bcn - adn)B^2\log\left((dx+c)^n\right) + (bcn - adn)AB + \left(bcn\log(e) - adn\log(e)\right)B^2} +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

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

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2}{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$g^2\left(\int\frac{a^2}{A^2+2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)+B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}\,dx+\int\frac{b^2x}{A^2+2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=36

$$\text{Int}\left(\frac{ag+bgx}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

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

Verification is Not applicable to the result.

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

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

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.99, size = 0, normalized size = 0.00

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

Verification is Not applicable to the result.

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

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

fricas [A] time = 0.89, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

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

giac [A] time = 0.00, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.07, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{b^{2}dgx^{3} + a^{2}cg + \left(b^{2}cg + 2\,abdg\right)x^{2} + \left(2\,abcg + a^{2}dg\right)x}{(bcn - adn)B^{2}\log\left((bx+a)^{n}\right) - (bcn - adn)B^{2}\log\left((dx+c)^{n}\right) + (bcn - adn)AB + \left(bcn\log(e) - adn\log(e)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

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

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g + b\,g\,x}{\left(A + B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.26 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=38

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

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

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.56, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

fricas [A] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\left(ABbgx+ABag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log(e*((b*x + a)/(d
*x + c))^n)^2 + 2*(A*B*b*g*x + A*B*a*g)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

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

maple [A] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

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

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

$$d\int \frac{1}{\left(bcgn - adgn\right)B^{2}\log\left(\left(bx+a\right)^{n}\right) - \left(bcgn - adgn\right)B^{2}\log\left(\left(dx+c\right)^{n}\right) + \left(bcgn - adgn\right)AB + \left(bcgn\log(e) - ad\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

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

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g + b\,g\,x\right)\,{\left(A + B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^{n}\right)\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.27 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=153

$$-\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^2n^2(a+bx)(bc-ad)}-\frac{c+dx}{Bg^2n(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

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

Rubi [F] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.19, size = 146, normalized size = 0.95

$$-\frac{(c+dx)\left(e^{\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\operatorname{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)+Bn\right)}{B^2g^2n^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] -(((c + d*x)*(B*n + E^(A/(B*n))*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*ExpInteg
ralEi[-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n))]*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])))/(B^2*(b*c - a*d)*g^2*n^2*(a + b*x)*(A + B*Log[e*((a +
b*x)/(c + d*x))^n])))
```

fricas [A] time = 0.88, size = 274, normalized size = 1.79

$$-\frac{Bdnx+Bcn+\left(Abx+Aa+(Bbx+Ba)\log(e)+(Bbnx+Ban)\log\left(\frac{bx+a}{dx+c}\right)\right)e}{\left(AB^2b^2c-AB^2abd\right)g^2n^2x+\left(AB^2abc-AB^2a^2d\right)g^2n^2+\left(\left(B^3b^2c-B^3abd\right)g^2n^2x+\left(B^3abc-B^3a^2d\right)g^2n^2\right)\log}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

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

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

$$\int \frac{1}{\left(bgx + ag\right)^2 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

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

maple **[F]** time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^2 \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

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

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

$$-\frac{}{(abcg^2n - a^2dg^2n)AB + (abcg^2n\log(e) - a^2dg^2n\log(e))B^2 + ((b^2cg^2n - abdg^2n)AB + (b^2cg^2n\log(e) - abdg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

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

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

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
[Out] int(1/((a*g + b*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
[Out] Timed out
```

3.28 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=314

$$-\frac{2be^{\frac{2A}{Bn}}(c+dx)^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}\text{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2g^3n^2(a+bx)^2(bc-ad)^2}+\frac{de^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^3n^2(a+bx)(bc-ad)^2}-\frac{}{Bg^3n}$$

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

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.62, size = 254, normalized size = 0.81

$$\frac{(c+dx)\Big(-2be^{\frac{2A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\text{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)+d(a+bx)e^{\frac{A}{Bn}}\Big(e\Big(\frac{a+bx}{c+dx}}{B^2g^3n^2(a+bx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

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

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

fricas [B] time = 0.93, size = 755, normalized size = 2.40

$$-\frac{\left(Bbcd - Bad^{2}\right)nx - \Big(Ab^{2}dx^{2} + 2\,Aabdx + Aa^{2}d + \big(Bb^{2}dx^{2} + 2\,Babdx + Ba^{2}d}{\left(AB^{2}b^{4}c^{2} - 2\,AB^{2}ab^{3}cd + AB^{2}a^{2}b^{2}d^{2}\right)g^{3}n^{2}x^{2} + 2\left(AB^{2}ab^{3}c^{2} - 2\,AB^{2}a^{2}b^{2}cd + AB^{2}a^{3}bd^{2}\right)g^{3}n^{2}x + \big(AB^{2}a^{2}b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

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

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

$$\int \frac{1}{{\left(bgx + ag\right)}^{3} {\left(B \log\left(e {\left(\frac{bx + a}{dx + c}\right)}^{n}\right) + A\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

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

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{3} \left(B \ln\left(e \left(\frac{bx + a}{dx + c}\right)^{n}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

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

$$-\frac{}{\left(a^{2}bcg^{3}n - a^{3}dg^{3}n\right)AB + \left(a^{2}bcg^{3}n \log(e) - a^{3}dg^{3}n \log(e)\right)B^{2} + \Big(\left(b^{3}cg^{3}n - ab^{2}dg^{3}n\right)AB + \big(b^{3}cg^{3}n \log(e) -}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

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

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.29 $\int (cg+dgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=188

$$\frac{g^4(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d}-\frac{Bg^4n(bc-ad)^5\log(a+bx)}{5b^5d}-\frac{Bg^4nx(bc-ad)^4}{5b^4}-\frac{Bg^4n(c+dx)^2(bc-ad)^3}{10b^3d}-$$

```
[Out] -1/5*B*(-a*d+b*c)^4*g^4*n*x/b^4-1/10*B*(-a*d+b*c)^3*g^4*n*(d*x+c)^2/b^3/d-1
/15*B*(-a*d+b*c)^2*g^4*n*(d*x+c)^3/b^2/d-1/20*B*(-a*d+b*c)*g^4*n*(d*x+c)^4/
b/d-1/5*B*(-a*d+b*c)^5*g^4*n*ln(b*x+a)/b^5/d+1/5*g^4*(d*x+c)^5*(A+B*ln(e*((
b*x+a)/(d*x+c))^n))/d
```

Rubi [A] time = 0.13, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

$$\frac{g^4(c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5d}-\frac{Bg^4nx(bc-ad)^4}{5b^4}-\frac{Bg^4n(c+dx)^2(bc-ad)^3}{10b^3d}-\frac{Bg^4n(c+dx)^3(bc-ad)^2}{15b^2d}-$$

Antiderivative was successfully verified.

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

```
[Out] -(B*(b*c - a*d)^4*g^4*n*x)/(5*b^4) - (B*(b*c - a*d)^3*g^4*n*(c + d*x)^2)/(1
0*b^3*d) - (B*(b*c - a*d)^2*g^4*n*(c + d*x)^3)/(15*b^2*d) - (B*(b*c - a*d)*
g^4*n*(c + d*x)^4)/(20*b*d) - (B*(b*c - a*d)^5*g^4*n*Log[a + b*x])/(5*b^5*d
) + (g^4*(c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*d)
```

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

$$\int (cg+dgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5d} - \frac{(Bn)\int\frac{(bc-ad)g^5(c+dx)^4}{a+bx}\,dx}{5dg}$$

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

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

$$= -\frac{B(bc-ad)^4g^4nx}{5b^4} - \frac{B(bc-ad)^3g^4n(c+dx)^2}{10b^3d} - \frac{B(bc-ad)^2g^4n(c}{15b^2d}$$

Mathematica [A] time = 0.10, size = 146, normalized size = 0.78

$$\frac{g^4\left((c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)\left(4b^3(c+dx)^3(bc-ad)+6b^2(c+dx)^2(bc-ad)^2+12bdx(bc-ad)^3+12(bc-ad)^4\log(a+bx)+3b^4(\right.}{12b^5}\right.}{5d}$$

Antiderivative was successfully verified.

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

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

fricas [B] time = 1.04, size = 572, normalized size = 3.04

$$\frac{12\,Ab^5d^5g^4x^5-12\,Bb^5c^5g^4n\log(dx+c)+12\left(5\,Bab^4c^4d-10\,Ba^2b^3c^3d^2+10\,Ba^3b^2c^2d^3-5\,Ba^4bcd^4+Ba^5d^5\right)g^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 - 12*B*b^5*c^5*g^4*n*log(d*x + c) + 12*(5*B*a*b^
4*c^4*d - 10*B*a^2*b^3*c^3*d^2 + 10*B*a^3*b^2*c^2*d^3 - 5*B*a^4*b*c*d^4 + B
*a^5*d^5)*g^4*n*log(b*x + a) + 3*(20*A*b^5*c*d^4*g^4 - (B*b^5*c*d^4 - B*a*b
^4*d^5)*g^4*n)*x^4 + 4*(30*A*b^5*c^2*d^3*g^4 - (4*B*b^5*c^2*d^3 - 5*B*a*b^4
*c*d^4 + B*a^2*b^3*d^5)*g^4*n)*x^3 + 6*(20*A*b^5*c^3*d^2*g^4 - (6*B*b^5*c^3
*d^2 - 10*B*a*b^4*c^2*d^3 + 5*B*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*g^4*n)*x^2 +
 12*(5*A*b^5*c^4*d*g^4 - (4*B*b^5*c^4*d - 10*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3
*c^2*d^3 - 5*B*a^3*b^2*c*d^4 + B*a^4*b*d^5)*g^4*n)*x + 12*(B*b^5*d^5*g^4*x^
5 + 5*B*b^5*c*d^4*g^4*x^4 + 10*B*b^5*c^2*d^3*g^4*x^3 + 10*B*b^5*c^3*d^2*g^4
*x^2 + 5*B*b^5*c^4*d*g^4*x)*log(e) + 12*(B*b^5*d^5*g^4*n*x^5 + 5*B*b^5*c*d^
4*g^4*n*x^4 + 10*B*b^5*c^2*d^3*g^4*n*x^3 + 10*B*b^5*c^3*d^2*g^4*n*x^2 + 5*B
*b^5*c^4*d*g^4*n*x)*log((b*x + a)/(d*x + c)))/(b^5*d)
```

giac [B] time = 5.99, size = 1862, normalized size = 9.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/60*(12*(B*b^6*c^6*g^4*n - 6*B*a*b^5*c^5*d*g^4*n + 15*B*a^2*b^4*c^4*d^2*g^
4*n - 20*B*a^3*b^3*c^3*d^3*g^4*n + 15*B*a^4*b^2*c^2*d^4*g^4*n - 6*B*a^5*b*c
*d^5*g^4*n + B*a^6*d^6*g^4*n)*log((b*x + a)/(d*x + c))/(b^5*d - 5*(b*x + a)
*b^4*d^2/(d*x + c) + 10*(b*x + a)^2*b^3*d^3/(d*x + c)^2 - 10*(b*x + a)^3*b^
2*d^4/(d*x + c)^3 + 5*(b*x + a)^4*b*d^5/(d*x + c)^4 - (b*x + a)^5*d^6/(d*x
+ c)^5) - (25*B*b^10*c^6*g^4*n - 150*B*a*b^9*c^5*d*g^4*n - 77*(b*x + a)*B*b
^9*c^6*d*g^4*n/(d*x + c) + 375*B*a^2*b^8*c^4*d^2*g^4*n + 462*(b*x + a)*B*a*
b^8*c^5*d^2*g^4*n/(d*x + c) + 94*(b*x + a)^2*B*b^8*c^6*d^2*g^4*n/(d*x + c)^
2 - 500*B*a^3*b^7*c^3*d^3*g^4*n - 1155*(b*x + a)*B*a^2*b^7*c^4*d^3*g^4*n/(d
*x + c) - 564*(b*x + a)^2*B*a*b^7*c^5*d^3*g^4*n/(d*x + c)^2 - 54*(b*x + a)^
3*B*b^7*c^6*d^3*g^4*n/(d*x + c)^3 + 375*B*a^4*b^6*c^2*d^4*g^4*n + 1540*(b*x
 + a)*B*a^3*b^6*c^3*d^4*g^4*n/(d*x + c) + 1410*(b*x + a)^2*B*a^2*b^6*c^4*d^
4*g^4*n/(d*x + c)^2 + 324*(b*x + a)^3*B*a*b^6*c^5*d^4*g^4*n/(d*x + c)^3 + 1
2*(b*x + a)^4*B*b^6*c^6*d^4*g^4*n/(d*x + c)^4 - 150*B*a^5*b^5*c*d^5*g^4*n -
 1155*(b*x + a)*B*a^4*b^5*c^2*d^5*g^4*n/(d*x + c) - 1880*(b*x + a)^2*B*a^3*
b^5*c^3*d^5*g^4*n/(d*x + c)^2 - 810*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^4*n/(d*
x + c)^3 - 72*(b*x + a)^4*B*a*b^5*c^5*d^5*g^4*n/(d*x + c)^4 + 25*B*a^6*b^4*
d^6*g^4*n + 462*(b*x + a)*B*a^5*b^4*c*d^6*g^4*n/(d*x + c) + 1410*(b*x + a)^
2*B*a^4*b^4*c^2*d^6*g^4*n/(d*x + c)^2 + 1080*(b*x + a)^3*B*a^3*b^4*c^3*d^6*
g^4*n/(d*x + c)^3 + 180*(b*x + a)^4*B*a^2*b^4*c^4*d^6*g^4*n/(d*x + c)^4 - 7
7*(b*x + a)*B*a^6*b^3*d^7*g^4*n/(d*x + c) - 564*(b*x + a)^2*B*a^5*b^3*c*d^7
*g^4*n/(d*x + c)^2 - 810*(b*x + a)^3*B*a^4*b^3*c^2*d^7*g^4*n/(d*x + c)^3 -
240*(b*x + a)^4*B*a^3*b^3*c^3*d^7*g^4*n/(d*x + c)^4 + 94*(b*x + a)^2*B*a^6*
b^2*d^8*g^4*n/(d*x + c)^2 + 324*(b*x + a)^3*B*a^5*b^2*c*d^8*g^4*n/(d*x + c)
^3 + 180*(b*x + a)^4*B*a^4*b^2*c^2*d^8*g^4*n/(d*x + c)^4 - 54*(b*x + a)^3*B
*a^6*b*d^9*g^4*n/(d*x + c)^3 - 72*(b*x + a)^4*B*a^5*b*c*d^9*g^4*n/(d*x + c)
^4 + 12*(b*x + a)^4*B*a^6*d^10*g^4*n/(d*x + c)^4 - 12*A*b^10*c^6*g^4 - 12*B
*b^10*c^6*g^4 + 72*A*a*b^9*c^5*d*g^4 + 72*B*a*b^9*c^5*d*g^4 - 180*A*a^2*b^8
*c^4*d^2*g^4 - 180*B*a^2*b^8*c^4*d^2*g^4 + 240*A*a^3*b^7*c^3*d^3*g^4 + 240*
B*a^3*b^7*c^3*d^3*g^4 - 180*A*a^4*b^6*c^2*d^4*g^4 - 180*B*a^4*b^6*c^2*d^4*g
^4 + 72*A*a^5*b^5*c*d^5*g^4 + 72*B*a^5*b^5*c*d^5*g^4 - 12*A*a^6*b^4*d^6*g^4
 - 12*B*a^6*b^4*d^6*g^4)/(b^9*d - 5*(b*x + a)*b^8*d^2/(d*x + c) + 10*(b*x +
 a)^2*b^7*d^3/(d*x + c)^2 - 10*(b*x + a)^3*b^6*d^4/(d*x + c)^3 + 5*(b*x + a
)^4*b^5*d^5/(d*x + c)^4 - (b*x + a)^5*b^4*d^6/(d*x + c)^5) + 12*(B*b^6*c^6*
g^4*n - 6*B*a*b^5*c^5*d*g^4*n + 15*B*a^2*b^4*c^4*d^2*g^4*n - 20*B*a^3*b^3*c
^3*d^3*g^4*n + 15*B*a^4*b^2*c^2*d^4*g^4*n - 6*B*a^5*b*c*d^5*g^4*n + B*a^6*d
^6*g^4*n)*log(b - (b*x + a)*d/(d*x + c))/(b^5*d) - 12*(B*b^6*c^6*g^4*n - 6*
B*a*b^5*c^5*d*g^4*n + 15*B*a^2*b^4*c^4*d^2*g^4*n - 20*B*a^3*b^3*c^3*d^3*g^4
*n + 15*B*a^4*b^2*c^2*d^4*g^4*n - 6*B*a^5*b*c*d^5*g^4*n + B*a^6*d^6*g^4*n)*
log((b*x + a)/(d*x + c))/(b^5*d))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.30, size = 0, normalized size = 0.00

$$\int \left(dgx+cg\right)^{4} \left(B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.38, size = 676, normalized size = 3.60

$$\frac{1}{5}\,Bd^{4}g^{4}x^{5}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{5}\,Ad^{4}g^{4}x^{5}+Bcd^{3}g^{4}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Acd^{3}g^{4}x^{4}+2\,Bc^{2}d^{2}g$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.48, size = 1045, normalized size = 5.56

$$x^2 \Bigg(\frac{(5\,a\,d+5\,b\,c) \Bigg(\frac{\left(\frac{d^3\,g^4\,(5\,A\,a\,d+25\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{5\,b}-\frac{A\,d^3\,g^4\,(5\,a\,d+5\,b\,c)}{5\,b}\right)(5\,a\,d+5\,b\,c)}{5\,b\,d} - \frac{c\,d^2\,g^4\,(5\,A\,a\,d+10\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{b} + \frac{A\,a\,c\,d^3\,g^4}{b}}{10\,b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^2*(((5*a*d + 5*b*c)*((((d^3*g^4*(5*A*a*d + 25*A*b*c + B*a*d*n - B*b*c*n))
/(5*b) - (A*d^3*g^4*(5*a*d + 5*b*c))/(5*b))*(5*a*d + 5*b*c))/(5*b*d) - (c*d
^2*g^4*(5*A*a*d + 10*A*b*c + B*a*d*n - B*b*c*n))/b + (A*a*c*d^3*g^4)/b))/(1
0*b*d) - (a*c*((d^3*g^4*(5*A*a*d + 25*A*b*c + B*a*d*n - B*b*c*n))/(5*b) - (
A*d^3*g^4*(5*a*d + 5*b*c))/(5*b)))/(2*b*d) + (c^2*d*g^4*(5*A*a*d + 5*A*b*c
+ B*a*d*n - B*b*c*n))/b) - x^3*((((d^3*g^4*(5*A*a*d + 25*A*b*c + B*a*d*n -
B*b*c*n))/(5*b) - (A*d^3*g^4*(5*a*d + 5*b*c))/(5*b))*(5*a*d + 5*b*c))/(15*b
*d) - (c*d^2*g^4*(5*A*a*d + 10*A*b*c + B*a*d*n - B*b*c*n))/(3*b) + (A*a*c*d
^3*g^4)/(3*b)) + x^4*((d^3*g^4*(5*A*a*d + 25*A*b*c + B*a*d*n - B*b*c*n))/(2
0*b) - (A*d^3*g^4*(5*a*d + 5*b*c))/(20*b)) + log(e*((a + b*x)/(c + d*x))^n)
*((B*d^4*g^4*x^5)/5 + B*c^4*g^4*x + 2*B*c^3*d*g^4*x^2 + B*c*d^3*g^4*x^4 + 2
*B*c^2*d^2*g^4*x^3) + x*((c^3*g^4*(10*A*a*d + 5*A*b*c + 2*B*a*d*n - 2*B*b*c
*n))/b - ((5*a*d + 5*b*c)*(((5*a*d + 5*b*c)*((((d^3*g^4*(5*A*a*d + 25*A*b*c
 + B*a*d*n - B*b*c*n))/(5*b) - (A*d^3*g^4*(5*a*d + 5*b*c))/(5*b))*(5*a*d +
5*b*c))/(5*b*d) - (c*d^2*g^4*(5*A*a*d + 10*A*b*c + B*a*d*n - B*b*c*n))/b +
(A*a*c*d^3*g^4)/b))/(5*b*d) - (a*c*((d^3*g^4*(5*A*a*d + 25*A*b*c + B*a*d*n
- B*b*c*n))/(5*b) - (A*d^3*g^4*(5*a*d + 5*b*c))/(5*b)))/(b*d) + (2*c^2*d*g^
4*(5*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/b))/(5*b*d) + (a*c*((((d^3*g^4*(
5*A*a*d + 25*A*b*c + B*a*d*n - B*b*c*n))/(5*b) - (A*d^3*g^4*(5*a*d + 5*b*c)
)/(5*b))*(5*a*d + 5*b*c))/(5*b*d) - (c*d^2*g^4*(5*A*a*d + 10*A*b*c + B*a*d*
n - B*b*c*n))/b + (A*a*c*d^3*g^4)/b))/(b*d)) + (log(a + b*x)*((B*a^5*d^4*g^
4*n)/5 + B*a*b^4*c^4*g^4*n - B*a^4*b*c*d^3*g^4*n - 2*B*a^2*b^3*c^3*d*g^4*n
+ 2*B*a^3*b^2*c^2*d^2*g^4*n))/b^5 + (A*d^4*g^4*x^5)/5 - (B*c^5*g^4*n*log(c
+ d*x))/(5*d)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.30 $\int (cg+dgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=156

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

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

Rubi **[A]** time = 0.10, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

```
[Out] -(B*(b*c - a*d)^3*g^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*g^3*n*(c + d*x)^2)/(8
*b^2*d) - (B*(b*c - a*d)*g^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*g^3
*n*Log[a + b*x])/(4*b^4*d) + (g^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*d)
```

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

$$\int (cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d} - \frac{(Bn)\int\frac{(bc-ad)g^4(c+dx)^3}{a+bx}\,dx}{4dg}$$

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

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

$$= -\frac{B(bc-ad)^3g^3nx}{4b^3} - \frac{B(bc-ad)^2g^3n(c+dx)^2}{8b^2d} - \frac{B(bc-ad)g^3n}{12bd}$$

Mathematica [**A**] time = 0.09, size = 124, normalized size = 0.79

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

Antiderivative was successfully verified.

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

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

fricas [**B**] time = 1.03, size = 429, normalized size = 2.75

$$\frac{6\,Ab^4d^4g^3x^4 - 6\,Bb^4c^4g^3n\log(dx+c) + 6\left(4\,Bab^3c^3d - 6\,Ba^2b^2c^2d^2 + 4\,Ba^3bcd^3 - Ba^4d^4\right)g^3n\log(bx+a) + }{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

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

giac [**B**] time = 4.45, size = 1390, normalized size = 8.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(6*(B*b^5*c^5*g^3*n - 5*B*a*b^4*c^4*d*g^3*n + 10*B*a^2*b^3*c^3*d^2*g^3
*n - 10*B*a^3*b^2*c^2*d^3*g^3*n + 5*B*a^4*b*c*d^4*g^3*n - B*a^5*d^5*g^3*n)*
```

```
log((b*x + a)/(d*x + c))/(b^4*d - 4*(b*x + a)*b^3*d^2/(d*x + c) + 6*(b*x +
a)^2*b^2*d^3/(d*x + c)^2 - 4*(b*x + a)^3*b*d^4/(d*x + c)^3 + (b*x + a)^4*d^
5/(d*x + c)^4) - (11*B*b^8*c^5*g^3*n - 55*B*a*b^7*c^4*d*g^3*n - 26*(b*x + a
)*B*b^7*c^5*d*g^3*n/(d*x + c) + 110*B*a^2*b^6*c^3*d^2*g^3*n + 130*(b*x + a)
*B*a*b^6*c^4*d^2*g^3*n/(d*x + c) + 21*(b*x + a)^2*B*b^6*c^5*d^2*g^3*n/(d*x
+ c)^2 - 110*B*a^3*b^5*c^2*d^3*g^3*n - 260*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3*
n/(d*x + c) - 105*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3*n/(d*x + c)^2 - 6*(b*x +
a)^3*B*b^5*c^5*d^3*g^3*n/(d*x + c)^3 + 55*B*a^4*b^4*c*d^4*g^3*n + 260*(b*x
+ a)*B*a^3*b^4*c^2*d^4*g^3*n/(d*x + c) + 210*(b*x + a)^2*B*a^2*b^4*c^3*d^4*
g^3*n/(d*x + c)^2 + 30*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3*n/(d*x + c)^3 - 11*B
*a^5*b^3*d^5*g^3*n - 130*(b*x + a)*B*a^4*b^3*c*d^5*g^3*n/(d*x + c) - 210*(b
*x + a)^2*B*a^3*b^3*c^2*d^5*g^3*n/(d*x + c)^2 - 60*(b*x + a)^3*B*a^2*b^3*c^
3*d^5*g^3*n/(d*x + c)^3 + 26*(b*x + a)*B*a^5*b^2*d^6*g^3*n/(d*x + c) + 105*
(b*x + a)^2*B*a^4*b^2*c*d^6*g^3*n/(d*x + c)^2 + 60*(b*x + a)^3*B*a^3*b^2*c^
2*d^6*g^3*n/(d*x + c)^3 - 21*(b*x + a)^2*B*a^5*b*d^7*g^3*n/(d*x + c)^2 - 30
*(b*x + a)^3*B*a^4*b*c*d^7*g^3*n/(d*x + c)^3 + 6*(b*x + a)^3*B*a^5*d^8*g^3*
n/(d*x + c)^3 - 6*A*b^8*c^5*g^3 - 6*B*b^8*c^5*g^3 + 30*A*a*b^7*c^4*d*g^3 +
30*B*a*b^7*c^4*d*g^3 - 60*A*a^2*b^6*c^3*d^2*g^3 - 60*B*a^2*b^6*c^3*d^2*g^3
+ 60*A*a^3*b^5*c^2*d^3*g^3 + 60*B*a^3*b^5*c^2*d^3*g^3 - 30*A*a^4*b^4*c*d^4*
g^3 - 30*B*a^4*b^4*c*d^4*g^3 + 6*A*a^5*b^3*d^5*g^3 + 6*B*a^5*b^3*d^5*g^3)/(
b^7*d - 4*(b*x + a)*b^6*d^2/(d*x + c) + 6*(b*x + a)^2*b^5*d^3/(d*x + c)^2 -
 4*(b*x + a)^3*b^4*d^4/(d*x + c)^3 + (b*x + a)^4*b^3*d^5/(d*x + c)^4) + 6*(
B*b^5*c^5*g^3*n - 5*B*a*b^4*c^4*d*g^3*n + 10*B*a^2*b^3*c^3*d^2*g^3*n - 10*B
*a^3*b^2*c^2*d^3*g^3*n + 5*B*a^4*b*c*d^4*g^3*n - B*a^5*d^5*g^3*n)*log(-b +
(b*x + a)*d/(d*x + c))/(b^4*d) - 6*(B*b^5*c^5*g^3*n - 5*B*a*b^4*c^4*d*g^3*n
 + 10*B*a^2*b^3*c^3*d^2*g^3*n - 10*B*a^3*b^2*c^2*d^3*g^3*n + 5*B*a^4*b*c*d^
4*g^3*n - B*a^5*d^5*g^3*n)*log((b*x + a)/(d*x + c))/(b^4*d))*(b*c/(b*c - a*
d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.27, size = 0, normalized size = 0.00

$$\int \left(dgx+cg\right)^{3}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.37, size = 479, normalized size = 3.07

$$\frac{1}{4}\,Bd^{3}g^{3}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{4}\,Ad^{3}g^{3}x^{4}+Bcd^{2}g^{3}x^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Acd^{2}g^{3}x^{3}+\frac{3}{2}\,Bc^{2}dg^{3}x^{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.37, size = 588, normalized size = 3.77

$$x^3\left(\frac{d^2\,g^3\,\left(4\,A\,a\,d+16\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n\right)}{12\,b}-\frac{A\,d^2\,g^3\,\left(4\,a\,d+4\,b\,c\right)}{12\,b}\right)-x^2\left(\frac{\left(\frac{d^2\,g^3\,\left(4\,A\,a\,d+16\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n\right)}{4\,b}\right.}{8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x^3*((d^2*g^3*(4*A*a*d + 16*A*b*c + B*a*d*n - B*b*c*n))/(12*b) - (A*d^2*g^3
*(4*a*d + 4*b*c))/(12*b)) - x^2*((((d^2*g^3*(4*A*a*d + 16*A*b*c + B*a*d*n -
 B*b*c*n))/(4*b) - (A*d^2*g^3*(4*a*d + 4*b*c))/(4*b))*(4*a*d + 4*b*c))/(8*b
*d) - (c*d*g^3*(4*A*a*d + 6*A*b*c + B*a*d*n - B*b*c*n))/(2*b) + (A*a*c*d^2*
g^3)/(2*b)) + log(e*((a + b*x)/(c + d*x))^n)*((B*d^3*g^3*x^4)/4 + B*c^3*g^3
*x + (3*B*c^2*d*g^3*x^2)/2 + B*c*d^2*g^3*x^3) + x*(((4*a*d + 4*b*c)*((((d^2
*g^3*(4*A*a*d + 16*A*b*c + B*a*d*n - B*b*c*n))/(4*b) - (A*d^2*g^3*(4*a*d +
4*b*c))/(4*b))*(4*a*d + 4*b*c))/(4*b*d) - (c*d*g^3*(4*A*a*d + 6*A*b*c + B*a
*d*n - B*b*c*n))/b + (A*a*c*d^2*g^3)/b))/(4*b*d) + (c^2*g^3*(12*A*a*d + 8*A
*b*c + 3*B*a*d*n - 3*B*b*c*n))/(2*b) - (a*c*((d^2*g^3*(4*A*a*d + 16*A*b*c +
 B*a*d*n - B*b*c*n))/(4*b) - (A*d^2*g^3*(4*a*d + 4*b*c))/(4*b)))/(b*d)) - (
log(a + b*x)*(B*a^4*d^3*g^3*n - 4*B*a*b^3*c^3*g^3*n - 4*B*a^3*b*c*d^2*g^3*n
 + 6*B*a^2*b^2*c^2*d*g^3*n))/(4*b^4) + (A*d^3*g^3*x^4)/4 - (B*c^4*g^3*n*log
(c + d*x))/(4*d)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.31 $\int (cg+dgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=124

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

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

Rubi [A] time = 0.08, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

$$\int (cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d} - \frac{(Bn)\int\frac{(bc-ad)g^3(c+dx)^2}{a+bx}dx}{3dg}$$

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

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

$$= -\frac{B(bc-ad)^2g^2nx}{3b^2} - \frac{B(bc-ad)g^2n(c+dx)^2}{6bd} - \frac{B(bc-ad)^3g^2n}{3b^3}$$

Mathematica [**A**] time = 0.06, size = 101, normalized size = 0.81

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

Antiderivative was successfully verified.

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

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

fricas [**B**] time = 1.04, size = 297, normalized size = 2.40

$$\frac{2\,Ab^3d^3g^2x^3 - 2\,Bb^3c^3g^2n\log(dx+c) + 2\left(3\,Bab^2c^2d - 3\,Ba^2bcd^2 + Ba^3d^3\right)g^2n\log(bx+a) + \left(6\,Ab^3cd^2g^2 - \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

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

giac [**B**] time = 3.15, size = 980, normalized size = 7.90

$$\frac{1}{6}\left(\frac{2\left(Bb^4c^4g^2n - 4\,Bab^3c^3dg^2n + 6\,Ba^2b^2c^2d^2g^2n - 4\,Ba^3bcd^3g^2n + Ba^4d^4g^2n\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^3d - \frac{3\,(bx+a)b^2d^2}{dx+c} + \frac{3\,(bx+a)^2bd^3}{(dx+c)^2} - \frac{(bx+a)^3d^4}{(dx+c)^3}} - \frac{3\,Bb^6c^4g^2n - 12}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*(2*(B*b^4*c^4*g^2*n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b^2*c^2*d^2*g^2*n
 - 4*B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log((b*x + a)/(d*x + c))/(b^3*d
 - 3*(b*x + a)*b^2*d^2/(d*x + c) + 3*(b*x + a)^2*b*d^3/(d*x + c)^2 - (b*x +
 a)^3*d^4/(d*x + c)^3) - (3*B*b^6*c^4*g^2*n - 12*B*a*b^5*c^3*d*g^2*n - 5*(b
*x + a)*B*b^5*c^4*d*g^2*n/(d*x + c) + 18*B*a^2*b^4*c^2*d^2*g^2*n + 20*(b*x
+ a)*B*a*b^4*c^3*d^2*g^2*n/(d*x + c) + 2*(b*x + a)^2*B*b^4*c^4*d^2*g^2*n/(d
*x + c)^2 - 12*B*a^3*b^3*c*d^3*g^2*n - 30*(b*x + a)*B*a^2*b^3*c^2*d^3*g^2*n
/(d*x + c) - 8*(b*x + a)^2*B*a*b^3*c^3*d^3*g^2*n/(d*x + c)^2 + 3*B*a^4*b^2*
d^4*g^2*n + 20*(b*x + a)*B*a^3*b^2*c*d^4*g^2*n/(d*x + c) + 12*(b*x + a)^2*B
*a^2*b^2*c^2*d^4*g^2*n/(d*x + c)^2 - 5*(b*x + a)*B*a^4*b*d^5*g^2*n/(d*x + c
) - 8*(b*x + a)^2*B*a^3*b*c*d^5*g^2*n/(d*x + c)^2 + 2*(b*x + a)^2*B*a^4*d^6
*g^2*n/(d*x + c)^2 - 2*A*b^6*c^4*g^2 - 2*B*b^6*c^4*g^2 + 8*A*a*b^5*c^3*d*g^
2 + 8*B*a*b^5*c^3*d*g^2 - 12*A*a^2*b^4*c^2*d^2*g^2 - 12*B*a^2*b^4*c^2*d^2*g
^2 + 8*A*a^3*b^3*c*d^3*g^2 + 8*B*a^3*b^3*c*d^3*g^2 - 2*A*a^4*b^2*d^4*g^2 -
2*B*a^4*b^2*d^4*g^2)/(b^5*d - 3*(b*x + a)*b^4*d^2/(d*x + c) + 3*(b*x + a)^2
*b^3*d^3/(d*x + c)^2 - (b*x + a)^3*b^2*d^4/(d*x + c)^3) + 2*(B*b^4*c^4*g^2*
n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b^2*c^2*d^2*g^2*n - 4*B*a^3*b*c*d^3*g^2
*n + B*a^4*d^4*g^2*n)*log(b - (b*x + a)*d/(d*x + c))/(b^3*d) - 2*(B*b^4*c^4
*g^2*n - 4*B*a*b^3*c^3*d*g^2*n + 6*B*a^2*b^2*c^2*d^2*g^2*n - 4*B*a^3*b*c*d^
3*g^2*n + B*a^4*d^4*g^2*n)*log((b*x + a)/(d*x + c))/(b^3*d))*(b*c/(b*c - a*
d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.27, size = 0, normalized size = 0.00

$$\int \left(dgx + cg\right)^2 \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.29, size = 309, normalized size = 2.49

$$\frac{1}{3}\,Bd^2g^2x^3\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{3}\,Ad^2g^2x^3+Bcdg^2x^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Acdg^2x^2+\frac{1}{6}\,Bd^2g^2n\left(\frac{2a}{\ }\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.31, size = 303, normalized size = 2.44

$$\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\,\left(B\,c^2\,g^2\,x+B\,c\,d\,g^2\,x^2+\frac{B\,d^2\,g^2\,x^3}{3}\right)-x\left(\frac{\left(3\,a\,d+3\,b\,c\right)\,\left(\frac{d\,g^2\,\left(3\,A\,a\,d+9\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n\right)}{3\,b}-\frac{A\,d\,g^2\,\left(3\,a\,d\right.}{3\,b}\right.}{3\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [**A**] time = 60.46, size = 779, normalized size = 6.28

$$\begin{cases} c^{2}g^{2}x\left(A+B\log\left(e\left(\frac{a}{c}\right)^{n}\right)\right) \\ Ac^{2}g^{2}x+Acdg^{2}x^{2}+\frac{Ad^{2}g^{2}x^{3}}{3}-\frac{Bc^{3}g^{2}n\log\left(c+dx\right)}{3d}+Bc^{2}g^{2}nx\log\left(a\right)-Bc^{2}g^{2}nx\log\left(c+dx\right)+\frac{Bc^{2}g^{2}nx}{3}+Bc^{2}g^{2}x \\ c^{2}g^{2}\left(Ax+\frac{Ban\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+Bnx\log\left(\frac{a}{c}+\frac{bx}{c}\right)-Bnx+Bx\log\left(e\right)\right) \\ Ac^{2}g^{2}x+Acdg^{2}x^{2}+\frac{Ad^{2}g^{2}x^{3}}{3}+\frac{Ba^{3}d^{2}g^{2}n\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{3b^{3}}+\frac{Ba^{3}d^{2}g^{2}n\log\left(\frac{c}{d}+x\right)}{3b^{3}}-\frac{Ba^{2}cdg^{2}n\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{b^{2}}- \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((c**2*g**2*x*(A + B*log(e*(a/c)**n)), Eq(b, 0) & Eq(d, 0)), (A*c*
*2*g**2*x + A*c*d*g**2*x**2 + A*d**2*g**2*x**3/3 - B*c**3*g**2*n*log(c + d*
x)/(3*d) + B*c**2*g**2*n*x*log(a) - B*c**2*g**2*n*x*log(c + d*x) + B*c**2*g
**2*n*x/3 + B*c**2*g**2*x*log(e) + B*c*d*g**2*n*x**2*log(a) - B*c*d*g**2*n*
x**2*log(c + d*x) + B*c*d*g**2*n*x**2/3 + B*c*d*g**2*x**2*log(e) + B*d**2*g
**2*n*x**3*log(a)/3 - B*d**2*g**2*n*x**3*log(c + d*x)/3 + B*d**2*g**2*n*x**
3/9 + B*d**2*g**2*x**3*log(e)/3, Eq(b, 0)), (c**2*g**2*(A*x + B*a*n*log(a/c
 + b*x/c)/b + B*n*x*log(a/c + b*x/c) - B*n*x + B*x*log(e)), Eq(d, 0)), (A*c
**2*g**2*x + A*c*d*g**2*x**2 + A*d**2*g**2*x**3/3 + B*a**3*d**2*g**2*n*log(
a/(c + d*x) + b*x/(c + d*x))/(3*b**3) + B*a**3*d**2*g**2*n*log(c/d + x)/(3*
b**3) - B*a**2*c*d*g**2*n*log(a/(c + d*x) + b*x/(c + d*x))/b**2 - B*a**2*c*
d*g**2*n*log(c/d + x)/b**2 - B*a**2*d**2*g**2*n*x/(3*b**2) + B*a*c**2*g**2*
n*log(a/(c + d*x) + b*x/(c + d*x))/b + B*a*c**2*g**2*n*log(c/d + x)/b + B*a
*c*d*g**2*n*x/b + B*a*d**2*g**2*n*x**2/(6*b) - B*c**3*g**2*n*log(c/d + x)/(
3*d) + B*c**2*g**2*n*x*log(a/(c + d*x) + b*x/(c + d*x)) - 2*B*c**2*g**2*n*x
/3 + B*c**2*g**2*x*log(e) + B*c*d*g**2*n*x**2*log(a/(c + d*x) + b*x/(c + d*
x)) - B*c*d*g**2*n*x**2/6 + B*c*d*g**2*x**2*log(e) + B*d**2*g**2*n*x**3*log
(a/(c + d*x) + b*x/(c + d*x))/3 + B*d**2*g**2*x**3*log(e)/3, True))
```

3.32 $\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=86

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

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

Rubi [A] time = 0.06, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 43

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

Rule 2525

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

Rubi steps

$$
\begin{aligned}
\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx &= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d} - \frac{(Bn)\int \frac{(bc-ad)g^2(c+dx)}{a+bx}dx}{2dg} \\
&= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d} - \frac{(B(bc-ad)gn)\int \frac{c+dx}{a+bx}dx}{2d} \\
&= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d} - \frac{(B(bc-ad)gn)\int \left(\frac{d}{b}+\frac{bc-}{b(a+}\right.}{2d} \\
&= -\frac{B(bc-ad)gnx}{2b} - \frac{B(bc-ad)^2gn\log(a+bx)}{2b^2d} + \frac{g(c+dx)^2\left(A+\right.}{}
\end{aligned}
$$

Mathematica **[A]** time = 0.04, size = 74, normalized size = 0.86

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

Antiderivative was successfully verified.

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

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

fricas **[B]** time = 0.70, size = 162, normalized size = 1.88

$$
\frac{Ab^2d^2gx^2 - Bb^2c^2gn\log(dx+c) + \left(2\,Babcd - Ba^2d^2\right)gn\log(bx+a) + \left(2\,Ab^2cdg - \left(Bb^2cd - Babd^2\right)gn\right)x + \left(\right.}{2\,b^2d}
$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac **[B]** time = 1.27, size = 572, normalized size = 6.65

$$
\frac{1}{2}\left(\frac{\left(Bb^3c^3gn - 3\,Bab^2c^2dgn + 3\,Ba^2bcd^2gn - Ba^3d^3gn\right)\log\left(\frac{bx+a}{dx+c}\right)}{b^2d - \frac{2\,(bx+a)bd^2}{dx+c} + \frac{(bx+a)^2d^3}{(dx+c)^2}} - \frac{Bb^4c^3gn - 3\,Bab^3c^2dgn - \frac{(bx+a)Bb^3c^3dgn}{dx+c} +}{}\right.
$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
 c) + (b*x + a)*B*a^3*d^4*g*n/(d*x + c) - A*b^4*c^3*g - B*b^4*c^3*g + 3*A*a
*b^3*c^2*d*g + 3*B*a*b^3*c^2*d*g - 3*A*a^2*b^2*c*d^2*g - 3*B*a^2*b^2*c*d^2*
g + A*a^3*b*d^3*g + B*a^3*b*d^3*g)/(b^3*d - 2*(b*x + a)*b^2*d^2/(d*x + c) +
 (b*x + a)^2*b*d^3/(d*x + c)^2) + (B*b^3*c^3*g*n - 3*B*a*b^2*c^2*d*g*n + 3*
B*a^2*b*c*d^2*g*n - B*a^3*d^3*g*n)*log(-b + (b*x + a)*d/(d*x + c))/(b^2*d)
- (B*b^3*c^3*g*n - 3*B*a*b^2*c^2*d*g*n + 3*B*a^2*b*c*d^2*g*n - B*a^3*d^3*g*
n)*log((b*x + a)/(d*x + c))/(b^2*d))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2
)
```

maple [F] time = 0.18, size = 0, normalized size = 0.00

$$\int \left(dgx+cg\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [A] time = 1.14, size = 156, normalized size = 1.81

$$\frac{1}{2}\,Bdgx^{2}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{2}\,Adgx^{2}-\frac{1}{2}\,Bdgn\left(\frac{a^{2}\log\left(bx+a\right)}{b^{2}}-\frac{c^{2}\log\left(dx+c\right)}{d^{2}}+\frac{\left(bc-ad\right)x}{bd}\right)+Bcgn\Bigg(a$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [B] time = 4.10, size = 134, normalized size = 1.56

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 40.68, size = 444, normalized size = 5.16

$$\begin{cases} cgx\left(A+B\log\left(e\left(\frac{a}{c}\right)^{n}\right)\right) \\ Acgx+\frac{Adgx^{2}}{2}-\frac{Bc^{2}gn\log\left(c+dx\right)}{2d}+Bcgnx\log\left(a\right)-Bcgnx\log\left(c+dx\right)+\frac{Bcgnx}{2}+Bcgx\log\left(e\right)+\frac{Bdgnx^{2}\log\left(a\right)}{2}-Bdgn \\ cg\left(Ax+\frac{Ban\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+Bnx\log\left(\frac{a}{c}+\frac{bx}{c}\right)-Bnx+Bx\log\left(e\right)\right) \\ Acgx+\frac{Adgx^{2}}{2}-\frac{Ba^{2}dgn\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{2b^{2}}-\frac{Ba^{2}dgn\log\left(\frac{c}{d}+x\right)}{2b^{2}}+\frac{Bacgn\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{b}+\frac{Bacgn\log\left(\frac{c}{d}+x\right)}{b}+\frac{Badgnx}{2b}-\frac{Bc^{2}gn\log\left(\frac{c}{d}\right.}{2d} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((c*g*x*(A + B*log(e*(a/c)**n)), Eq(b, 0) & Eq(d, 0)), (A*c*g*x +
A*d*g*x**2/2 - B*c**2*g*n*log(c + d*x)/(2*d) + B*c*g*n*x*log(a) - B*c*g*n*x
*log(c + d*x) + B*c*g*n*x/2 + B*c*g*x*log(e) + B*d*g*n*x**2*log(a)/2 - B*d*
g*n*x**2*log(c + d*x)/2 + B*d*g*n*x**2/4 + B*d*g*x**2*log(e)/2, Eq(b, 0)),
(c*g*(A*x + B*a*n*log(a/c + b*x/c)/b + B*n*x*log(a/c + b*x/c) - B*n*x + B*x
*log(e)), Eq(d, 0)), (A*c*g*x + A*d*g*x**2/2 - B*a**2*d*g*n*log(a/(c + d*x)
 + b*x/(c + d*x))/(2*b**2) - B*a**2*d*g*n*log(c/d + x)/(2*b**2) + B*a*c*g*n
*log(a/(c + d*x) + b*x/(c + d*x))/b + B*a*c*g*n*log(c/d + x)/b + B*a*d*g*n*
x/(2*b) - B*c**2*g*n*log(c/d + x)/(2*d) + B*c*g*n*x*log(a/(c + d*x) + b*x/(
c + d*x)) - B*c*g*n*x/2 + B*c*g*x*log(e) + B*d*g*n*x**2*log(a/(c + d*x) + b
*x/(c + d*x))/2 + B*d*g*x**2*log(e)/2, True))
```

3.33 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{cg+dgx}\,dx$

Optimal. Leaf size=80

$$-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg}-\frac{Bn\,\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{dg}$$

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

Rubi **[A]** time = 0.20, antiderivative size = 128, normalized size of antiderivative = 1.60, number of steps used = 9, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2524, 2418, 2394, 2393, 2391, 2390, 12, 2301}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 2301

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

Rule 2390

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

Rule 2391

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

Rule 2393

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

Rule 2394

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

Rule 2418

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

Rule 2524

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

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{cg+dgx}\,dx &= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg}-\frac{(Bn)\int\frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\log(cg+dgx)}{a+bx}\\
&= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg}-\frac{(Bn)\int\left(\frac{b\log(cg+dgx)}{a+bx}-\frac{d\log(cg+dgx)}{c+dx}\right)dx}{dg}\\
&= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg}+\frac{(Bn)\int\frac{\log(cg+dgx)}{c+dx}\,dx}{g}-\frac{(bBn)\int}{dg}\\
&= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg}+\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg}+\\
&= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg}+\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg}+\\
&= \frac{Bn\log^2(g(c+dx))}{2dg}-\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg}+\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{dg}
\end{aligned}$$

Mathematica [A] time = 0.04, size = 101, normalized size = 1.26

$$\frac{\log(g(c+dx))\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-2Bn\log\left(\frac{d(a+bx)}{ad-bc}\right)+2A+Bn\log(g(c+dx))\right)-2Bn\,\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{2dg}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.99, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{dgx+cg},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

maple [F] time = 0.37, size = 0, normalized size = 0.00

$$\int\frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{dgx+cg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{1}{2}B\Bigg(\frac{2\,n\log\left(bx+a\right)\log\left(dx+c\right)-n\log\left(dx+c\right)^{2}-2\,\log\left(dx+c\right)\log\left(\left(bx+a\right)^{n}\right)+2\,\log\left(dx+c\right)\log\big(\left(dx+c}{dg}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.34 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^2}\,dx$

<u>**Optimal**</u>. Leaf size=102

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

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

<u>**Rubi**</u> **[A]** time = 0.09, antiderivative size = 107, normalized size of antiderivative = 1.05, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{dg^2(c+dx)}+\frac{bBn\log(a+bx)}{dg^2(bc-ad)}-\frac{bBn\log(c+dx)}{dg^2(bc-ad)}+\frac{Bn}{dg^2(c+dx)}$$

Antiderivative was successfully verified.

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

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

<u>Rule 12</u>

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

<u>Rule 44</u>

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

<u>Rule 2525</u>

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

<u>Rubi steps</u>

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^2}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{dg^2(c+dx)} + \frac{(Bn)\int\frac{bc-ad}{g(a+bx)(c+dx)^2}\,dx}{dg}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{dg^2(c+dx)} + \frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)^2}\,dx}{dg^2}$$

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

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

Mathematica [**A**] time = 0.06, size = 114, normalized size = 1.12

$$\frac{Bn(bc-ad)\left(\frac{1}{(c+dx)(bc-ad)}+\frac{b\log(a+bx)}{(bc-ad)^2}-\frac{b\log(c+dx)}{(bc-ad)^2}\right)}{dg^2} - \frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{dg(cg+dgx)}$$

Antiderivative was successfully verified.

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

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

fricas [**A**] time = 0.84, size = 105, normalized size = 1.03

$$-\frac{Abc - Aad - (Bbc - Bad)n + (Bbc - Bad)\log(e) - (Bbdnx + Badn)\log\left(\frac{bx+a}{dx+c}\right)}{\left(bcd^2 - ad^3\right)g^2x + \left(bc^2d - acd^2\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x, algorithm="fric
as")
```

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

giac [**A**] time = 3.77, size = 89, normalized size = 0.87

$$\left(\frac{(bx+a)Bn\log\left(\frac{bx+a}{dx+c}\right)}{(dx+c)g^2} - \frac{(Bn-A-B)(bx+a)}{(dx+c)g^2}\right)\left(\frac{bc}{(bc-ad)^2} - \frac{ad}{(bc-ad)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple **[F]** time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(dgx+cg\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima **[A]** time = 1.13, size = 136, normalized size = 1.33

$$Bn\left(\frac{1}{d^{2}g^{2}x+cdg^{2}}+\frac{b\log\left(bx+a\right)}{\left(bcd-ad^{2}\right)g^{2}}-\frac{b\log\left(dx+c\right)}{\left(bcd-ad^{2}\right)g^{2}}\right)-\frac{B\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)}{d^{2}g^{2}x+cdg^{2}}-\frac{A}{d^{2}g^{2}x+cdg^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x, algorithm="maxi
ma")
```

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

mupad **[B]** time = 4.02, size = 113, normalized size = 1.11

$$-\frac{A-B\,n}{x\,d^2\,g^2+c\,d\,g^2}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{d\,\left(c\,g^2+d\,g^2\,x\right)}+\frac{B\,b\,n\,\mathrm{atan}\left(\frac{b\,c\,2{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}+1{}\mathrm{i}\right)\,2{}\mathrm{i}}{d\,g^2\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

3.35 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^3}\,dx$

Optimal. Leaf size=151

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

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

Rubi [A] time = 0.11, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 44}

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

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2525

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

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^3}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2dg^3(c+dx)^2} + \frac{(Bn)\int \frac{bc-ad}{g^2(a+bx)(c+dx)^3}\,dx}{2dg}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2dg^3(c+dx)^2} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)^3}\,dx}{2dg^3}$$

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

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

Mathematica [**A**] time = 0.15, size = 115, normalized size = 0.76

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

Antiderivative was successfully verified.

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

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

fricas [**A**] time = 0.97, size = 266, normalized size = 1.76

$$-\frac{2\,Ab^2c^2 - 4\,Aabcd + 2\,Aa^2d^2 - 2\left(Bb^2cd - Babd^2\right)nx - \left(3\,Bb^2c^2 - 4\,Babcd + Ba^2d^2\right)n + 2\left(Bb^2c^2 - 2\,Babcd + B\right.}{4\left(\left(b^2c^2d^3 - 2\,abcd^4 + a^2d^5\right)g^3x^2 + 2\left(b^2c^3d^2 - 2\,abc^2d^3 + a^2cd^4\right)g^3x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x, algorithm="fric
as")
```

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

giac [**A**] time = 6.45, size = 203, normalized size = 1.34

$$\frac{1}{4}\left(2\left(\frac{2\,(bx+a)Bbn}{\left(bcg^3-adg^3\right)(dx+c)} - \frac{(bx+a)^2Bdn}{\left(bcg^3-adg^3\right)(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right) + \frac{(Bdn-2\,Ad-2\,Bd)(bx+a)^2}{\left(bcg^3-adg^3\right)(dx+c)^2} - \frac{4\,(Bbn-}{\left(bcg^3-\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(dgx+cg\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [A] time = 1.36, size = 259, normalized size = 1.72

$$\frac{1}{4}\,Bn\left(\frac{2\,bdx+3\,bc-ad}{\left(bcd^{3}-ad^{4}\right)g^{3}x^{2}+2\left(bc^{2}d^{2}-acd^{3}\right)g^{3}x+\left(bc^{3}d-ac^{2}d^{2}\right)g^{3}}+\frac{2\,b^{2}\log\left(bx+a\right)}{\left(b^{2}c^{2}d-2\,abcd^{2}+a^{2}d^{3}\right)g^{3}}-\frac{2\,b^{2}\,\mathrm{lc}}{\left(b^{2}c^{2}d-2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.55, size = 221, normalized size = 1.46

$$\frac{B\,b^2\,n\,\mathrm{atanh}\left(\frac{2\,a^2\,d^3\,g^3-2\,b^2\,c^2\,d\,g^3}{2\,d\,g^3\,{\left(a\,d-b\,c\right)}^2}+\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{d\,g^3\,{\left(a\,d-b\,c\right)}^2}-\frac{B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}{2\,d\,\left(c^2\,g^3+2\,c\,d\,g^3\,x+d^2\,g^3\,x^2\right)}-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c-B\,a\,d\,n+3\,B\,b\,c\,n}{2\,\left(a\,d-b\,c\right)}+\frac{B\,b\,d\,n\,x}{a\,d-b\,c}}{2\,c^2\,d\,g^3+4\,c\,d^2\,g^3\,x+2\,d^3\,g^3\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

3.36 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^4}\,dx$

Optimal. Leaf size=183

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3dg^4(c+dx)^3}+\frac{b^3Bn\log(a+bx)}{3dg^4(bc-ad)^3}-\frac{b^3Bn\log(c+dx)}{3dg^4(bc-ad)^3}+\frac{b^2Bn}{3dg^4(c+dx)(bc-ad)^2}+\frac{bBn}{6dg^4(c+dx)^2(bc-ad)}+$$

```
[Out] 1/9*B*n/d/g^4/(d*x+c)^3+1/6*b*B*n/d/(-a*d+b*c)/g^4/(d*x+c)^2+1/3*b^2*B*n/d/
(-a*d+b*c)^2/g^4/(d*x+c)+1/3*b^3*B*n*ln(b*x+a)/d/(-a*d+b*c)^3/g^4+1/3*(-A-B
*ln(e*((b*x+a)/(d*x+c))^n))/d/g^4/(d*x+c)^3-1/3*b^3*B*n*ln(d*x+c)/d/(-a*d+b
*c)^3/g^4
```

Rubi [A] time = 0.14, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = $\{2525, 12, 44\}$

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3dg^4(c+dx)^3}+\frac{b^2Bn}{3dg^4(c+dx)(bc-ad)^2}+\frac{b^3Bn\log(a+bx)}{3dg^4(bc-ad)^3}-\frac{b^3Bn\log(c+dx)}{3dg^4(bc-ad)^3}+\frac{bBn}{6dg^4(c+dx)^2(bc-ad)}+$$

Antiderivative was successfully verified.

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

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

Rule 12

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

Rule 44

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

Rule 2525

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

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^4}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3dg^4(c+dx)^3} + \frac{(Bn)\int \frac{bc-ad}{g^3(a+bx)(c+dx)^4}\,dx}{3dg}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3dg^4(c+dx)^3} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)^4}\,dx}{3dg^4}$$

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

$$= \frac{Bn}{9dg^4(c+dx)^3} + \frac{bBn}{6d(bc-ad)g^4(c+dx)^2} + \frac{b^2Bn}{3d(bc-ad)^2g^4(c+dx)} + \frac{b^3Bn\log(}{3d(bc-}$$

Mathematica [**A**] time = 0.17, size = 146, normalized size = 0.80

$$\frac{\frac{Bn\left((bc-ad)\left(2a^2d^2-abd(7c+3dx)+b^2\left(11c^2+15cdx+6d^2x^2\right)\right)+6b^3(c+dx)^3\log(a+bx)-6b^3(c+dx)^3\log(c+dx)\right)}{(bc-ad)^3} - 6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{18dg^4(c+dx)^3}$$

Antiderivative was successfully verified.

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

```
[Out] (-6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*n*((b*c - a*d)*(2*a^2*d^2 -
 a*b*d*(7*c + 3*d*x) + b^2*(11*c^2 + 15*c*d*x + 6*d^2*x^2)) + 6*b^3*(c + d*
x)^3*Log[a + b*x] - 6*b^3*(c + d*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(18*d*g
^4*(c + d*x)^3)
```

fricas [**B**] time = 0.93, size = 483, normalized size = 2.64

$$-\frac{6\,Ab^3c^3 - 18\,Aab^2c^2d + 18\,Aa^2bcd^2 - 6\,Aa^3d^3 - 6\left(Bb^3cd^2 - Bab^2d^3\right)nx^2 - 3\left(5\,Bb^3c^2d - 6\,Bab^2cd^2 + Ba^2bd\right.}{18\left(\left(b^3c^3d^4 - 3\,ab^2c^2d^5 + 3\,a^2bcd^6 - a^3d^7\right)g^4x^3 + \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/18*(6*A*b^3*c^3 - 18*A*a*b^2*c^2*d + 18*A*a^2*b*c*d^2 - 6*A*a^3*d^3 - 6*
(B*b^3*c*d^2 - B*a*b^2*d^3)*n*x^2 - 3*(5*B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + B*
a^2*b*d^3)*n*x - (11*B*b^3*c^3 - 18*B*a*b^2*c^2*d + 9*B*a^2*b*c*d^2 - 2*B*a
^3*d^3)*n + 6*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2 - B*a^3*d^3)*l
og(e) - 6*(B*b^3*d^3*n*x^3 + 3*B*b^3*c*d^2*n*x^2 + 3*B*b^3*c^2*d*n*x + (3*B
*a*b^2*c^2*d - 3*B*a^2*b*c*d^2 + B*a^3*d^3)*n)*log((b*x + a)/(d*x + c)))/((
b^3*c^3*d^4 - 3*a*b^2*c^2*d^5 + 3*a^2*b*c*d^6 - a^3*d^7)*g^4*x^3 + 3*(b^3*c
^4*d^3 - 3*a*b^2*c^3*d^4 + 3*a^2*b*c^2*d^5 - a^3*c*d^6)*g^4*x^2 + 3*(b^3*c^
5*d^2 - 3*a*b^2*c^4*d^3 + 3*a^2*b*c^3*d^4 - a^3*c^2*d^5)*g^4*x + (b^3*c^6*d
 - 3*a*b^2*c^5*d^2 + 3*a^2*b*c^4*d^3 - a^3*c^3*d^4)*g^4)
```

giac [**B**] time = 7.70, size = 399, normalized size = 2.18

$$\frac{1}{18}\left(6\left(\frac{3\,(bx+a)Bb^2n}{\left(b^2c^2g^4 - 2\,abcdg^4 + a^2d^2g^4\right)(dx+c)} - \frac{3\,(bx+a)^2Bbdn}{\left(b^2c^2g^4 - 2\,abcdg^4 + a^2d^2g^4\right)(dx+c)^2} + \frac{(bx+a)^3}{\left(b^2c^2g^4 - 2\,abcdg^4 + \right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/18*(6*(3*(b*x + a)*B*b^2*n/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(
d*x + c)) - 3*(b*x + a)^2*B*b*d*n/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g
^4)*(d*x + c)^2) + (b*x + a)^3*B*d^2*n/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*
d^2*g^4)*(d*x + c)^3))*log((b*x + a)/(d*x + c)) - 2*(B*d^2*n - 3*A*d^2 - 3*
B*d^2)*(b*x + a)^3/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(d*x + c)^3
) + 9*(B*b*d*n - 2*A*b*d - 2*B*b*d)*(b*x + a)^2/((b^2*c^2*g^4 - 2*a*b*c*d*g
^4 + a^2*d^2*g^4)*(d*x + c)^2) - 18*(B*b^2*n - A*b^2 - B*b^2)*(b*x + a)/((b
^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(d*x + c)))*(b*c/(b*c - a*d)^2 -
a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{B \ln\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}{\left(dgx + cg\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maxima [B] time = 1.37, size = 433, normalized size = 2.37

$$\frac{1}{18}\, Bn \left(\frac{6\, b^2 d^2 x^2 + 11\, b^2 c^2 - 7\, abcd + 2\, a^2 d^2 + 3\, \left(5\, b^2 cd - abd^2\right) x}{\left(b^2 c^2 d^4 - 2\, abcd^5 + a^2 d^6\right) g^4 x^3 + 3\, \left(b^2 c^3 d^3 - 2\, abc^2 d^4 + a^2 cd^5\right) g^4 x^2 + 3\, \left(b^2 c^4 d^2 - 2\, abc^3 d^3 + a^2 c^2 d^4\right) g^4 x +} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x, algorithm="maxi
ma")
```

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

mupad [B] time = 4.72, size = 349, normalized size = 1.91

$$\frac{B\, a^2\, d\, n}{9\, g^4\, {\left(a\, d-b\, c\right)}^2\, {\left(c+d\, x\right)}^3}-\frac{A\, a^2\, d}{3\, g^4\, {\left(a\, d-b\, c\right)}^2\, {\left(c+d\, x\right)}^3}-\frac{A\, b^2\, c^2}{3\, d\, g^4\, {\left(a\, d-b\, c\right)}^2\, {\left(c+d\, x\right)}^3}-\frac{B\, \ln\left(e\, {\left(\frac{a+b\, x}{c+d\, x}\right)}^n\right)}{3\, d\, g^4\, {\left(c+d\, x\right)}^3}+\frac{2\, A}{3\, g^4\, (a\, d-b}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
c + d*x)^3) - (7*B*a*b*c*n)/(18*g^4*(a*d - b*c)^2*(c + d*x)^3) + (11*B*b^2*
c^2*n)/(18*d*g^4*(a*d - b*c)^2*(c + d*x)^3) + (5*B*b^2*c*n*x)/(6*g^4*(a*d -
 b*c)^2*(c + d*x)^3) - (B*a*b*d*n*x)/(6*g^4*(a*d - b*c)^2*(c + d*x)^3)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.37 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^5}\,dx$

Optimal. Leaf size=215

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4dg^5(c+dx)^4}+\frac{b^4Bn\log(a+bx)}{4dg^5(bc-ad)^4}-\frac{b^4Bn\log(c+dx)}{4dg^5(bc-ad)^4}+\frac{b^3Bn}{4dg^5(c+dx)(bc-ad)^3}+\frac{b^2Bn}{8dg^5(c+dx)^2(bc-ad)^2}$$

```
[Out] 1/16*B*n/d/g^5/(d*x+c)^4+1/12*b*B*n/d/(-a*d+b*c)/g^5/(d*x+c)^3+1/8*b^2*B*n/
d/(-a*d+b*c)^2/g^5/(d*x+c)^2+1/4*b^3*B*n/d/(-a*d+b*c)^3/g^5/(d*x+c)+1/4*b^4
*B*n*ln(b*x+a)/d/(-a*d+b*c)^4/g^5+1/4*(-A-B*ln(e*((b*x+a)/(d*x+c))^n))/d/g^
5/(d*x+c)^4-1/4*b^4*B*n*ln(d*x+c)/d/(-a*d+b*c)^4/g^5
```

Rubi [A] time = 0.18, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4dg^5(c+dx)^4}+\frac{b^3Bn}{4dg^5(c+dx)(bc-ad)^3}+\frac{b^2Bn}{8dg^5(c+dx)^2(bc-ad)^2}+\frac{b^4Bn\log(a+bx)}{4dg^5(bc-ad)^4}-\frac{b^4Bn\log(c+dx)}{4dg^5(bc-ad)^4}$$

Antiderivative was successfully verified.

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

```
[Out] (B*n)/(16*d*g^5*(c + d*x)^4) + (b*B*n)/(12*d*(b*c - a*d)*g^5*(c + d*x)^3) +
 (b^2*B*n)/(8*d*(b*c - a*d)^2*g^5*(c + d*x)^2) + (b^3*B*n)/(4*d*(b*c - a*d)
^3*g^5*(c + d*x)) + (b^4*B*n*Log[a + b*x])/(4*d*(b*c - a*d)^4*g^5) - (A + B
*Log[e*((a + b*x)/(c + d*x))^n])/(4*d*g^5*(c + d*x)^4) - (b^4*B*n*Log[c + d
*x])/(4*d*(b*c - a*d)^4*g^5)
```

Rule 12

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

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^5}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4dg^5(c+dx)^4} + \frac{(Bn)\int \frac{bc-ad}{g^4(a+bx)(c+dx)^5}\,dx}{4dg}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4dg^5(c+dx)^4} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)^5}\,dx}{4dg^5}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4dg^5(c+dx)^4} + \frac{(B(bc-ad)n)\int \left(\frac{b^5}{(bc-ad)^5(a+bx)} - \frac{d}{(bc-ad)(c+dx)^5} - \frac{}{(bc-ad)}\right.}{}$$

$$= \frac{Bn}{16dg^5(c+dx)^4} + \frac{bBn}{12d(bc-ad)g^5(c+dx)^3} + \frac{b^2Bn}{8d(bc-ad)^2g^5(c+dx)^2} + \frac{}{4d(bc}$$

Mathematica [**A**] time = 0.23, size = 162, normalized size = 0.75

$$\frac{\frac{Bn\left(12b^4\log(a+bx)+\frac{12b^3(bc-ad)}{c+dx}+\frac{6b^2(bc-ad)^2}{(c+dx)^2}+\frac{4b(bc-ad)^3}{(c+dx)^3}+\frac{3(bc-ad)^4}{(c+dx)^4}-12b^4\log(c+dx)\right)}{12(bc-ad)^4}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{(c+dx)^4}}{4dg^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^5,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c + d*x)^4) + (B*n*((3*(b*c - a*
d)^4)/(c + d*x)^4 + (4*b*(b*c - a*d)^3)/(c + d*x)^3 + (6*b^2*(b*c - a*d)^2)
/(c + d*x)^2 + (12*b^3*(b*c - a*d))/(c + d*x) + 12*b^4*Log[a + b*x] - 12*b^
4*Log[c + d*x]))/(12*(b*c - a*d)^4))/(4*d*g^5)
```

fricas [**B**] time = 1.09, size = 735, normalized size = 3.42

$$-\frac{12\,Ab^4c^4 - 48\,Aab^3c^3d + 72\,Aa^2b^2c^2d^2 - 48\,Aa^3bcd^3 + 12\,Aa^4d^4 - 12\left(Bb^4cd^3 - Bab^3d^4\right)nx^3 - 6\,(7\,Bb^4c^2d^2}{48\,((b^4c^4d^5 - 4\,ab^3c^3d^6 + 6\,a^2b^2c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/48*(12*A*b^4*c^4 - 48*A*a*b^3*c^3*d + 72*A*a^2*b^2*c^2*d^2 - 48*A*a^3*b*
c*d^3 + 12*A*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*n*x^3 - 6*(7*B*b^4*c^
2*d^2 - 8*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n*x^2 - 4*(13*B*b^4*c^3*d - 18*B*a
*b^3*c^2*d^2 + 6*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*n*x - (25*B*b^4*c^4 - 48*B*
a*b^3*c^3*d + 36*B*a^2*b^2*c^2*d^2 - 16*B*a^3*b*c*d^3 + 3*B*a^4*d^4)*n + 12
*(B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B*a
^4*d^4)*log(e) - 12*(B*b^4*d^4*n*x^4 + 4*B*b^4*c*d^3*n*x^3 + 6*B*b^4*c^2*d^
2*n*x^2 + 4*B*b^4*c^3*d*n*x + (4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*
a^3*b*c*d^3 - B*a^4*d^4)*n)*log((b*x + a)/(d*x + c)))/((b^4*c^4*d^5 - 4*a*b
^3*c^3*d^6 + 6*a^2*b^2*c^2*d^7 - 4*a^3*b*c*d^8 + a^4*d^9)*g^5*x^4 + 4*(b^4*
c^5*d^4 - 4*a*b^3*c^4*d^5 + 6*a^2*b^2*c^3*d^6 - 4*a^3*b*c^2*d^7 + a^4*c*d^8
)*g^5*x^3 + 6*(b^4*c^6*d^3 - 4*a*b^3*c^5*d^4 + 6*a^2*b^2*c^4*d^5 - 4*a^3*b*
c^3*d^6 + a^4*c^2*d^7)*g^5*x^2 + 4*(b^4*c^7*d^2 - 4*a*b^3*c^6*d^3 + 6*a^2*b
^2*c^5*d^4 - 4*a^3*b*c^4*d^5 + a^4*c^3*d^6)*g^5*x + (b^4*c^8*d - 4*a*b^3*c^
7*d^2 + 6*a^2*b^2*c^6*d^3 - 4*a^3*b*c^5*d^4 + a^4*c^4*d^5)*g^5)
```

giac [B] time = 11.42, size = 676, normalized size = 3.14

$$\frac{1}{48}\left(12\left(\frac{4\,(bx+a)Bb^3n}{\left(b^3c^3g^5-3\,ab^2c^2dg^5+3\,a^2bcd^2g^5-a^3d^3g^5\right)(dx+c)}-\frac{6\,(bx+a)^2Bb^2dn}{\left(b^3c^3g^5-3\,ab^2c^2dg^5+3\,a^2bcd^2g^5-a^3d^3g^5\right)(dx}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x, algorithm="giac
")
```

```
[Out] 1/48*(12*(4*(b*x + a)*B*b^3*n/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c
*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)) - 6*(b*x + a)^2*B*b^2*d*n/((b^3*c^3*g^5
- 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^2) + 4*(b*
x + a)^3*B*b*d^2*n/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 -
a^3*d^3*g^5)*(d*x + c)^3) - (b*x + a)^4*B*d^3*n/((b^3*c^3*g^5 - 3*a*b^2*c^2
*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^4))*log((b*x + a)/(d*x
+ c)) + 3*(B*d^3*n - 4*A*d^3 - 4*B*d^3)*(b*x + a)^4/((b^3*c^3*g^5 - 3*a*b^2
*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^4) - 16*(B*b*d^2*n
- 3*A*b*d^2 - 3*B*b*d^2)*(b*x + a)^3/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*
a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^3) + 36*(B*b^2*d*n - 2*A*b^2*d - 2
*B*b^2*d)*(b*x + a)^2/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5
 - a^3*d^3*g^5)*(d*x + c)^2) - 48*(B*b^3*n - A*b^3 - B*b^3)*(b*x + a)/((b^3
*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)))
*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(dgx+cg\right)^{5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(d*g*x+c*g)^5,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(d*g*x+c*g)^5,x)
```

maxima [B] time = 1.06, size = 652, normalized size = 3.03

$$\frac{1}{48}\,Bn\left(\frac{12\,b^3d^3x^3+25\,b^3c^3-23\,ab^2c^2d+13\,a^2bc}{\left(b^3c^3d^5-3\,ab^2c^2d^6+3\,a^2bcd^7-a^3d^8\right)g^5x^4+4\left(b^3c^4d^4-3\,ab^2c^3d^5+3\,a^2bc^2d^6-a^3cd^7\right)g^5x^3+6\left(b^3c^5d^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/48*B*n*((12*b^3*d^3*x^3 + 25*b^3*c^3 - 23*a*b^2*c^2*d + 13*a^2*b*c*d^2 -
3*a^3*d^3 + 6*(7*b^3*c*d^2 - a*b^2*d^3)*x^2 + 4*(13*b^3*c^2*d - 5*a*b^2*c*d
^2 + a^2*b*d^3)*x)/((b^3*c^3*d^5 - 3*a*b^2*c^2*d^6 + 3*a^2*b*c*d^7 - a^3*d^
8)*g^5*x^4 + 4*(b^3*c^4*d^4 - 3*a*b^2*c^3*d^5 + 3*a^2*b*c^2*d^6 - a^3*c*d^7
)*g^5*x^3 + 6*(b^3*c^5*d^3 - 3*a*b^2*c^4*d^4 + 3*a^2*b*c^3*d^5 - a^3*c^2*d^
6)*g^5*x^2 + 4*(b^3*c^6*d^2 - 3*a*b^2*c^5*d^3 + 3*a^2*b*c^4*d^4 - a^3*c^3*d
^5)*g^5*x + (b^3*c^7*d - 3*a*b^2*c^6*d^2 + 3*a^2*b*c^5*d^3 - a^3*c^4*d^4)*g
^5) + 12*b^4*log(b*x + a)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3
 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5) - 12*b^4*log(d*x + c)/((b^4*c^4*d - 4*a*b^
3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5)) - 1/4*B*log(
e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d
```

```
^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c^4*d*g^5) - 1/4*A/(d^5*g^5*x^4 + 4*c*d^4*g^
5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c^4*d*g^5)
```

mupad [**B**] time = 4.99, size = 603, normalized size = 2.80

$$\frac{B\,b^4\,n\,\mathrm{atanh}\left(\frac{4\,a^4\,d^5\,g^5-8\,a^3\,b\,c\,d^4\,g^5+8\,a\,b^3\,c^3\,d^2\,g^5-4\,b^4\,c^4\,d\,g^5}{4\,d\,g^5\,(a\,d-b\,c)^4}+\frac{2\,b\,d\,x\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}{(a\,d-b\,c)^4}\right)}{2\,d\,g^5\,(a\,d-b\,c)^4}-\frac{}{4\,d\,\left(c^4\,g^5+4\,c^3\,d\,g^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(c*g + d*g*x)^5,x)
```

```
[Out] (B*b^4*n*atanh((4*a^4*d^5*g^5 - 4*b^4*c^4*d*g^5 - 8*a^3*b*c*d^4*g^5 + 8*a*b
^3*c^3*d^2*g^5)/(4*d*g^5*(a*d - b*c)^4) + (2*b*d*x*(a^3*d^3 - b^3*c^3 + 3*a
*b^2*c^2*d - 3*a^2*b*c*d^2))/(a*d - b*c)^4))/(2*d*g^5*(a*d - b*c)^4) - (B*l
og(e*((a + b*x)/(c + d*x))^n))/(4*d*(c^4*g^5 + d^4*g^5*x^4 + 4*c*d^3*g^5*x^
3 + 6*c^2*d^2*g^5*x^2 + 4*c^3*d*g^5*x)) - ((12*A*a^3*d^3 - 12*A*b^3*c^3 - 3
*B*a^3*d^3*n + 25*B*b^3*c^3*n + 36*A*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 23*B*
a*b^2*c^2*d*n + 13*B*a^2*b*c*d^2*n)/(12*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d
- 3*a^2*b*c*d^2)) + (b*x*(B*a^2*d^3*n + 13*B*b^2*c^2*d*n - 5*B*a*b*c*d^2*n)
)/(3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (b^2*x^2*(B*a*d
^3*n - 7*B*b*c*d^2*n))/(2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^
2)) + (B*b^3*d^3*n*x^3)/(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)
)/(4*c^4*d*g^5 + 4*d^5*g^5*x^4 + 16*c^3*d^2*g^5*x + 16*c*d^4*g^5*x^3 + 24*c
^2*d^3*g^5*x^2)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*g*x+c*g)**5,x)
```

```
[Out] Timed out
```

3.38 $\int (cg+dgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=544

$$\frac{2Bg^4n(bc-ad)^5\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^5d}-\frac{2Bg^4n(a+bx)(bc-ad)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^5}-Bg$$

```
[Out] 13/30*B^2*(-a*d+b*c)^4*g^4*n^2*x/b^4+7/60*B^2*(-a*d+b*c)^3*g^4*n^2*(d*x+c)^
2/b^3/d+1/30*B^2*(-a*d+b*c)^2*g^4*n^2*(d*x+c)^3/b^2/d-2/5*B*(-a*d+b*c)^4*g^
4*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^5-1/5*B*(-a*d+b*c)^3*g^4*n*(d
*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/d-2/15*B*(-a*d+b*c)^2*g^4*n*(d*
x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d-1/10*B*(-a*d+b*c)*g^4*n*(d*x+c
)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d+1/5*g^4*(d*x+c)^5*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))^2/d+13/30*B^2*(-a*d+b*c)^5*g^4*n^2*ln((b*x+a)/(d*x+c))/b^5/d
+5/6*B^2*(-a*d+b*c)^5*g^4*n^2*ln(d*x+c)/b^5/d+2/5*B*(-a*d+b*c)^5*g^4*n*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^5/d-2/5*B^2*(-a*d+b
*c)^5*g^4*n^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b^5/d
```

Rubi [A] time = 0.88, antiderivative size = 634, normalized size of antiderivative = 1.17, number of steps used = 27, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.371$, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{2B^2g^4n^2(bc-ad)^5\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{5b^5d}-\frac{2Bg^4n(bc-ad)^5\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^5d}-Bg^4n(c+dx)^2$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^4*g^4*n*x)/(5*b^4) + (13*B^2*(b*c - a*d)^4*g^4*n^2*x)/(
30*b^4) + (7*B^2*(b*c - a*d)^3*g^4*n^2*(c + d*x)^2)/(60*b^3*d) + (B^2*(b*c
- a*d)^2*g^4*n^2*(c + d*x)^3)/(30*b^2*d) + (13*B^2*(b*c - a*d)^5*g^4*n^2*Lo
g[a + b*x])/(30*b^5*d) + (B^2*(b*c - a*d)^5*g^4*n^2*Log[a + b*x]^2)/(5*b^5*
d) - (2*B^2*(b*c - a*d)^4*g^4*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
5*b^5) - (B*(b*c - a*d)^3*g^4*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(5*b^3*d) - (2*B*(b*c - a*d)^2*g^4*n*(c + d*x)^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(15*b^2*d) - (B*(b*c - a*d)*g^4*n*(c + d*x)^4*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b*d) - (2*B*(b*c - a*d)^5*g^4*n*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^5*d) + (g^4*(c + d*x)^
5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*d) + (2*B^2*(b*c - a*d)^5*g^
4*n^2*Log[c + d*x])/(5*b^5*d) - (2*B^2*(b*c - a*d)^5*g^4*n^2*Log[a + b*x]*L
og[(b*(c + d*x))/(b*c - a*d)])/(5*b^5*d) - (2*B^2*(b*c - a*d)^5*g^4*n^2*Pol
yLog[2, -((d*(a + b*x))/(b*c - a*d))])/(5*b^5*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (cg+dgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx=\frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d}-\frac{(2Bn)\int\frac{(bc-ad)g^5(c+dx)^4\left(A+\right.}{a+b}}{5dg}$$

$$=\frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d}-\frac{\left(2B(bc-ad)g^4n\right)\int\frac{(c+dx)}{}}{5d}$$

$$=\frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d}-\frac{\left(2B(bc-ad)g^4n\right)\int\left(\frac{d(bc-}{}\right.}{}$$

$$=\frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d}-\frac{\left(2B(bc-ad)g^4n\right)\int(c+}{}$$

$$=-\frac{2AB(bc-ad)^4g^4nx}{5b^4}-\frac{B(bc-ad)^3g^4n(c+dx)^2\left(A+B\log\left(e\left(\right.\right.\right.}{5b^3d}$$

$$=-\frac{2AB(bc-ad)^4g^4nx}{5b^4}-\frac{2B^2(bc-ad)^4g^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{5b^5}$$

$$=-\frac{2AB(bc-ad)^4g^4nx}{5b^4}-\frac{2B^2(bc-ad)^4g^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.}{5b^5}$$

$$=-\frac{2AB(bc-ad)^4g^4nx}{5b^4}+\frac{13B^2(bc-ad)^4g^4n^2x}{30b^4}+\frac{7B^2(bc-ad)^3g^4}{60b^3}$$

$$=-\frac{2AB(bc-ad)^4g^4nx}{5b^4}+\frac{13B^2(bc-ad)^4g^4n^2x}{30b^4}+\frac{7B^2(bc-ad)^3g^4}{60b^3}$$

$$=-\frac{2AB(bc-ad)^4g^4nx}{5b^4}+\frac{13B^2(bc-ad)^4g^4n^2x}{30b^4}+\frac{7B^2(bc-ad)^3g^4}{60b^3}$$

Mathematica [A] time = 0.50, size = 533, normalized size = 0.98

$$\frac{g^4\left((c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2-\frac{Bn(bc-ad)\left(6b^4(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+8b^3(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+12\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^4*((c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c - a*d)^3*n*(b*d*x + (b*c - a*d)*Lo
g[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 +
2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*
b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b
*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 12*b
^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*b^3
*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*b^4*(c
+ d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*(b*c - a*d)^4*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c +
d*x] - 12*B*(b*c - a*d)^4*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x
))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(12*b^5)))
/(5*d)
```

fricas [F] time = 0.85, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2d^4g^4x^4+4\,A^2cd^3g^4x^3+6\,A^2c^2d^2g^4x^2+4\,A^2c^3dg^4x+A^2c^4g^4+\left(B^2d^4g^4x^4+4\,B^2cd^3g^4x^3+6\,B^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^4*g^4*x^4 + 4*A^2*c*d^3*g^4*x^3 + 6*A^2*c^2*d^2*g^4*x^2 + 4*
A^2*c^3*d*g^4*x + A^2*c^4*g^4 + (B^2*d^4*g^4*x^4 + 4*B^2*c*d^3*g^4*x^3 + 6*
B^2*c^2*d^2*g^4*x^2 + 4*B^2*c^3*d*g^4*x + B^2*c^4*g^4)*log(e*((b*x + a)/(d*
x + c))^n)^2 + 2*(A*B*d^4*g^4*x^4 + 4*A*B*c*d^3*g^4*x^3 + 6*A*B*c^2*d^2*g^4
*x^2 + 4*A*B*c^3*d*g^4*x + A*B*c^4*g^4)*log(e*((b*x + a)/(d*x + c))^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \left(dgx+cg\right)^4\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^4*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((d*g*x+c*g)^4*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [**B**] time = 4.78, size = 2880, normalized size = 5.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/5*A*B*d^4*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*d^4*g^
4*x^5 + 2*A*B*c*d^3*g^4*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*
d^3*g^4*x^4 + 4*A*B*c^2*d^2*g^4*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
+ 2*A^2*c^2*d^2*g^4*x^3 + 4*A*B*c^3*d*g^4*x^2*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + 2*A^2*c^3*d*g^4*x^2 + 1/30*A*B*d^4*g^4*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/3*A*B*c*d^3*g^4*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 2*A*B*c^2*d^2*g^4*n*(2*a^3*log
(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*
c^2 - a^2*d^2)*x)/(b^2*d^2)) - 4*A*B*c^3*d*g^4*n*(a^2*log(b*x + a)/b^2 - c^
2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*c^4*g^4*n*(a*log(b*x + a)
/b - c*log(d*x + c)/d) + 2*A*B*c^4*g^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n) + A^2*c^4*g^4*x - 1/30*(77*a*b^3*c^4*d*g^4*n^2 - 94*a^2*b^2*c^3*d^2*g^
4*n^2 + 54*a^3*b*c^2*d^3*g^4*n^2 - 12*a^4*c*d^4*g^4*n^2 - (25*g^4*n^2 - 12*
g^4*n*log(e))*b^4*c^5)*B^2*log(d*x + c)/(b^4*d) - 2/5*(b^5*c^5*g^4*n^2 - 5*
a*b^4*c^4*d*g^4*n^2 + 10*a^2*b^3*c^3*d^2*g^4*n^2 - 10*a^3*b^2*c^2*d^3*g^4*n
^2 + 5*a^4*b*c*d^4*g^4*n^2 - a^5*d^5*g^4*n^2)*(log(b*x + a)*log((b*d*x + a*
d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^5*d) + 1/60
*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 + 24*B^2*b^5*c^5*g^4*n^2*log(b*x + a)*log
(d*x + c) - 12*B^2*b^5*c^5*g^4*n^2*log(d*x + c)^2 + 6*(a*b^4*d^5*g^4*n*log(
e) - (g^4*n*log(e) - 10*g^4*log(e)^2)*b^5*c*d^4)*B^2*x^4 + 2*((g^4*n^2 - 16
*g^4*n*log(e) + 60*g^4*log(e)^2)*b^5*c^2*d^3 - 2*(g^4*n^2 - 10*g^4*n*log(e)
)*a*b^4*c*d^4 + (g^4*n^2 - 4*g^4*n*log(e))*a^2*b^3*d^5)*B^2*x^3 + ((13*g^4*
n^2 - 72*g^4*n*log(e) + 120*g^4*log(e)^2)*b^5*c^3*d^2 - 3*(11*g^4*n^2 - 40*
g^4*n*log(e))*a*b^4*c^2*d^3 + 3*(9*g^4*n^2 - 20*g^4*n*log(e))*a^2*b^3*c*d^4
 - (7*g^4*n^2 - 12*g^4*n*log(e))*a^3*b^2*d^5)*B^2*x^2 - 12*(5*a*b^4*c^4*d*g
^4*n^2 - 10*a^2*b^3*c^3*d^2*g^4*n^2 + 10*a^3*b^2*c^2*d^3*g^4*n^2 - 5*a^4*b*
c*d^4*g^4*n^2 + a^5*d^5*g^4*n^2)*B^2*log(b*x + a)^2 + 2*((23*g^4*n^2 - 48*g
^4*n*log(e) + 30*g^4*log(e)^2)*b^5*c^4*d - (79*g^4*n^2 - 120*g^4*n*log(e))*
a*b^4*c^3*d^2 + 6*(17*g^4*n^2 - 20*g^4*n*log(e))*a^2*b^3*c^2*d^3 - (59*g^4*
n^2 - 60*g^4*n*log(e))*a^3*b^2*c*d^4 + (13*g^4*n^2 - 12*g^4*n*log(e))*a^4*b
*d^5)*B^2*x - 2*(12*(4*g^4*n^2 - 5*g^4*n*log(e))*a*b^4*c^4*d - 12*(13*g^4*n
^2 - 10*g^4*n*log(e))*a^2*b^3*c^3*d^2 + 4*(49*g^4*n^2 - 30*g^4*n*log(e))*a^
3*b^2*c^2*d^3 - (113*g^4*n^2 - 60*g^4*n*log(e))*a^4*b*c*d^4 + (25*g^4*n^2 -
 12*g^4*n*log(e))*a^5*d^5)*B^2*log(b*x + a) + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B
^2*b^5*c*d^4*g^4*x^4 + 10*B^2*b^5*c^2*d^3*g^4*x^3 + 10*B^2*b^5*c^3*d^2*g^4*
x^2 + 5*B^2*b^5*c^4*d*g^4*x)*log((b*x + a)^n)^2 + 12*(B^2*b^5*d^5*g^4*x^5 +
 5*B^2*b^5*c*d^4*g^4*x^4 + 10*B^2*b^5*c^2*d^3*g^4*x^3 + 10*B^2*b^5*c^3*d^2*
g^4*x^2 + 5*B^2*b^5*c^4*d*g^4*x)*log((d*x + c)^n)^2 + 2*(12*B^2*b^5*d^5*g^4
*x^5*log(e) - 12*B^2*b^5*c^5*g^4*n*log(d*x + c) + 3*(a*b^4*d^5*g^4*n - (g^4
*n - 20*g^4*log(e))*b^5*c*d^4)*B^2*x^4 + 4*(5*a*b^4*c*d^4*g^4*n - a^2*b^3*d
^5*g^4*n - 2*(2*g^4*n - 15*g^4*log(e))*b^5*c^2*d^3)*B^2*x^3 + 6*(10*a*b^4*c
^2*d^3*g^4*n - 5*a^2*b^3*c*d^4*g^4*n + a^3*b^2*d^5*g^4*n - 2*(3*g^4*n - 10*
g^4*log(e))*b^5*c^3*d^2)*B^2*x^2 + 12*(10*a*b^4*c^3*d^2*g^4*n - 10*a^2*b^3*
c^2*d^3*g^4*n + 5*a^3*b^2*c*d^4*g^4*n - a^4*b*d^5*g^4*n - (4*g^4*n - 5*g^4*
log(e))*b^5*c^4*d)*B^2*x + 12*(5*a*b^4*c^4*d*g^4*n - 10*a^2*b^3*c^3*d^2*g^4
*n + 10*a^3*b^2*c^2*d^3*g^4*n - 5*a^4*b*c*d^4*g^4*n + a^5*d^5*g^4*n)*B^2*lo
g(b*x + a))*log((b*x + a)^n) - 2*(12*B^2*b^5*d^5*g^4*x^5*log(e) - 12*B^2*b^
```

```
5*c^5*g^4*n*log(d*x + c) + 3*(a*b^4*d^5*g^4*n - (g^4*n - 20*g^4*log(e))*b^5
*c*d^4)*B^2*x^4 + 4*(5*a*b^4*c*d^4*g^4*n - a^2*b^3*d^5*g^4*n - 2*(2*g^4*n -
 15*g^4*log(e))*b^5*c^2*d^3)*B^2*x^3 + 6*(10*a*b^4*c^2*d^3*g^4*n - 5*a^2*b^
3*c*d^4*g^4*n + a^3*b^2*d^5*g^4*n - 2*(3*g^4*n - 10*g^4*log(e))*b^5*c^3*d^2
)*B^2*x^2 + 12*(10*a*b^4*c^3*d^2*g^4*n - 10*a^2*b^3*c^2*d^3*g^4*n + 5*a^3*b
^2*c*d^4*g^4*n - a^4*b*d^5*g^4*n - (4*g^4*n - 5*g^4*log(e))*b^5*c^4*d)*B^2*
x + 12*(5*a*b^4*c^4*d*g^4*n - 10*a^2*b^3*c^3*d^2*g^4*n + 10*a^3*b^2*c^2*d^3
*g^4*n - 5*a^4*b*c*d^4*g^4*n + a^5*d^5*g^4*n)*B^2*log(b*x + a) + 12*(B^2*b^
5*d^5*g^4*x^5 + 5*B^2*b^5*c*d^4*g^4*x^4 + 10*B^2*b^5*c^2*d^3*g^4*x^3 + 10*B
^2*b^5*c^3*d^2*g^4*x^2 + 5*B^2*b^5*c^4*d*g^4*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b^5*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(c g + d g x\right)^4 \left(A + B\,\ln\left(e\left(\frac{a + b x}{c + d x}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)^4*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*g + d*g*x)^4*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**4*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.39 $\int (cg+dgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=454

$$\frac{Bg^3n(bc-ad)^4\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-\frac{Bg^3n(a+bx)(bc-ad)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4}-Bg^3n$$

```
[Out] 5/12*B^2*(-a*d+b*c)^3*g^3*n^2*x/b^3+1/12*B^2*(-a*d+b*c)^2*g^3*n^2*(d*x+c)^2
/b^2/d-1/2*B*(-a*d+b*c)^3*g^3*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4
-1/4*B*(-a*d+b*c)^2*g^3*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d-1
/6*B*(-a*d+b*c)*g^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d+1/4*g^3
*(d*x+c)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d+5/12*B^2*(-a*d+b*c)^4*g^3*n^
2*ln((b*x+a)/(d*x+c))/b^4/d+11/12*B^2*(-a*d+b*c)^4*g^3*n^2*ln(d*x+c)/b^4/d+
1/2*B*(-a*d+b*c)^4*g^3*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(
b*x+a))/b^4/d-1/2*B^2*(-a*d+b*c)^4*g^3*n^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b
^4/d
```

Rubi [A] time = 0.68, antiderivative size = 544, normalized size of antiderivative = 1.20, number of steps used = 23, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{B^2g^3n^2(bc-ad)^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2b^4d}-\frac{Bg^3n(bc-ad)^4\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-Bg^3n(c+dx)^2(bc$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*g^3*n*x)/(2*b^3) + (5*B^2*(b*c - a*d)^3*g^3*n^2*x)/(12*
b^3) + (B^2*(b*c - a*d)^2*g^3*n^2*(c + d*x)^2)/(12*b^2*d) + (5*B^2*(b*c - a
*d)^4*g^3*n^2*Log[a + b*x])/(12*b^4*d) + (B^2*(b*c - a*d)^4*g^3*n^2*Log[a +
 b*x]^2)/(4*b^4*d) - (B^2*(b*c - a*d)^3*g^3*n*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n])/(2*b^4) - (B*(b*c - a*d)^2*g^3*n*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(4*b^2*d) - (B*(b*c - a*d)*g^3*n*(c + d*x)^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) - (B*(b*c - a*d)^4*g^3*n*Log[a + b
*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*d) + (g^3*(c + d*x)^4*(A
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*d) + (B^2*(b*c - a*d)^4*g^3*n^2*
Log[c + d*x])/(2*b^4*d) - (B^2*(b*c - a*d)^4*g^3*n^2*Log[a + b*x]*Log[(b*(c
 + d*x))/(b*c - a*d)])/(2*b^4*d) - (B^2*(b*c - a*d)^4*g^3*n^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(2*b^4*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx=\frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{(Bn)\int\frac{(bc-ad)g^4(c+dx)^3\left(A+B\right.}{a+bx}}{2dg}$$

$$=\frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{\left(B(bc-ad)g^3n\right)\int\frac{(c+dx)^3}{}}{2d}$$

$$=\frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{\left(B(bc-ad)g^3n\right)\int\left(\frac{d(bc-a}{}\right.}{}$$

$$=\frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d}-\frac{\left(B(bc-ad)g^3n\right)\int(c+dx}{}$$

$$=-\frac{AB(bc-ad)^3g^3nx}{2b^3}-\frac{B(bc-ad)^2g^3n(c+dx)^2\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{4b^2d}$$

$$=-\frac{AB(bc-ad)^3g^3nx}{2b^3}-\frac{B^2(bc-ad)^3g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2b^4}-$$

$$=-\frac{AB(bc-ad)^3g^3nx}{2b^3}-\frac{B^2(bc-ad)^3g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2b^4}-$$

$$=-\frac{AB(bc-ad)^3g^3nx}{2b^3}+\frac{5B^2(bc-ad)^3g^3n^2x}{12b^3}+\frac{B^2(bc-ad)^2g^3n^2(c}{12b^2d}$$

$$=-\frac{AB(bc-ad)^3g^3nx}{2b^3}+\frac{5B^2(bc-ad)^3g^3n^2x}{12b^3}+\frac{B^2(bc-ad)^2g^3n^2(c}{12b^2d}$$

$$=-\frac{AB(bc-ad)^3g^3nx}{2b^3}+\frac{5B^2(bc-ad)^3g^3n^2x}{12b^3}+\frac{B^2(bc-ad)^2g^3n^2(c}{12b^2d}$$

Mathematica [A] time = 0.34, size = 409, normalized size = 0.90

$$\frac{g^3\left((c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2-\frac{Bn(bc-ad)\left(2b^3(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+3b^2(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+6(bc-a\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^3*((c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Log[
a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c
 - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b*c
 - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c -
a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)]))))/(3*b^4)))/(4*d)
```

fricas [F] time = 1.04, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^{2}d^{3}g^{3}x^{3}+3\,A^{2}cd^{2}g^{3}x^{2}+3\,A^{2}c^{2}dg^{3}x+A^{2}c^{3}g^{3}+\Big(B^{2}d^{3}g^{3}x^{3}+3\,B^{2}cd^{2}g^{3}x^{2}+3\,B^{2}c^{2}dg^{3}x+B^{2}c^{3}g^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^3*g^3*x^3 + 3*A^2*c*d^2*g^3*x^2 + 3*A^2*c^2*d*g^3*x + A^2*c^
3*g^3 + (B^2*d^3*g^3*x^3 + 3*B^2*c*d^2*g^3*x^2 + 3*B^2*c^2*d*g^3*x + B^2*c^
3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*g^3*x^3 + 3*A*B*c*d^2*
g^3*x^2 + 3*A*B*c^2*d*g^3*x + A*B*c^3*g^3)*log(e*((b*x + a)/(d*x + c))^n),
x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.27, size = 0, normalized size = 0.00

$$\int \left(dgx+cg\right)^{3} \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^3*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((d*g*x+c*g)^3*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 4.85, size = 2129, normalized size = 4.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*d^3*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*d^3*g^
3*x^4 + 2*A*B*c*d^2*g^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*
d^2*g^3*x^3 + 3*A*B*c^2*d*g^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
3/2*A^2*c^2*d*g^3*x^2 - 1/12*A*B*d^3*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*
log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*c*d^2*g^3*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*c^2*d*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*c^3*g^3*n*(a*log(b*x + a)/b
 - c*log(d*x + c)/d) + 2*A*B*c^3*g^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + A^2*c^3*g^3*x - 1/12*(26*a*b^2*c^3*d*g^3*n^2 - 21*a^2*b*c^2*d^2*g^3*n^
2 + 6*a^3*c*d^3*g^3*n^2 - (11*g^3*n^2 - 6*g^3*n*log(e))*b^3*c^4)*B^2*log(d*
x + c)/(b^3*d) - 1/2*(b^4*c^4*g^3*n^2 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c
^2*d^2*g^3*n^2 - 4*a^3*b*c*d^3*g^3*n^2 + a^4*d^4*g^3*n^2)*(log(b*x + a)*log
((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b
^4*d) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 6*B^2*b^4*c^4*g^3*n^2*log(b*
x + a)*log(d*x + c) - 3*B^2*b^4*c^4*g^3*n^2*log(d*x + c)^2 + 2*(a*b^3*d^4*g
^3*n*log(e) - (g^3*n*log(e) - 6*g^3*log(e)^2)*b^4*c*d^3)*B^2*x^3 + ((g^3*n^
2 - 9*g^3*n*log(e) + 18*g^3*log(e)^2)*b^4*c^2*d^2 - 2*(g^3*n^2 - 6*g^3*n*lo
g(e))*a*b^3*c*d^3 + (g^3*n^2 - 3*g^3*n*log(e))*a^2*b^2*d^4)*B^2*x^2 - 3*(4*
a*b^3*c^3*d*g^3*n^2 - 6*a^2*b^2*c^2*d^2*g^3*n^2 + 4*a^3*b*c*d^3*g^3*n^2 - a
^4*d^4*g^3*n^2)*B^2*log(b*x + a)^2 + ((7*g^3*n^2 - 18*g^3*n*log(e) + 12*g^3
*log(e)^2)*b^4*c^3*d - (19*g^3*n^2 - 36*g^3*n*log(e))*a*b^3*c^2*d^2 + (17*g
^3*n^2 - 24*g^3*n*log(e))*a^2*b^2*c*d^3 - (5*g^3*n^2 - 6*g^3*n*log(e))*a^3*
b*d^4)*B^2*x - (6*(3*g^3*n^2 - 4*g^3*n*log(e))*a*b^3*c^3*d - 9*(5*g^3*n^2 -
 4*g^3*n*log(e))*a^2*b^2*c^2*d^2 + 2*(19*g^3*n^2 - 12*g^3*n*log(e))*a^3*b*c
*d^3 - (11*g^3*n^2 - 6*g^3*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4
*d^4*g^3*x^4 + 4*B^2*b^4*c*d^3*g^3*x^3 + 6*B^2*b^4*c^2*d^2*g^3*x^2 + 4*B^2*
b^4*c^3*d*g^3*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*c*
d^3*g^3*x^3 + 6*B^2*b^4*c^2*d^2*g^3*x^2 + 4*B^2*b^4*c^3*d*g^3*x)*log((d*x +
 c)^n)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) - 6*B^2*b^4*c^4*g^3*n*log(d*x + c)
 + 2*(a*b^3*d^4*g^3*n - (g^3*n - 12*g^3*log(e))*b^4*c*d^3)*B^2*x^3 + 3*(4*a
*b^3*c*d^3*g^3*n - a^2*b^2*d^4*g^3*n - 3*(g^3*n - 4*g^3*log(e))*b^4*c^2*d^2
)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*g^3*n - 4*a^2*b^2*c*d^3*g^3*n + a^3*b*d^4*g^
3*n - (3*g^3*n - 4*g^3*log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*c^3*d*g^3*n -
6*a^2*b^2*c^2*d^2*g^3*n + 4*a^3*b*c*d^3*g^3*n - a^4*d^4*g^3*n)*B^2*log(b*x
+ a))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g^3*x^4*log(e) - 6*B^2*b^4*c^4*g^3*
n*log(d*x + c) + 2*(a*b^3*d^4*g^3*n - (g^3*n - 12*g^3*log(e))*b^4*c*d^3)*B^
2*x^3 + 3*(4*a*b^3*c*d^3*g^3*n - a^2*b^2*d^4*g^3*n - 3*(g^3*n - 4*g^3*log(e
))*b^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*g^3*n - 4*a^2*b^2*c*d^3*g^3*n
+ a^3*b*d^4*g^3*n - (3*g^3*n - 4*g^3*log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*
c^3*d*g^3*n - 6*a^2*b^2*c^2*d^2*g^3*n + 4*a^3*b*c*d^3*g^3*n - a^4*d^4*g^3*n
)*B^2*log(b*x + a) + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*c*d^3*g^3*x^3 + 6*B
^2*b^4*c^2*d^2*g^3*x^2 + 4*B^2*b^4*c^3*d*g^3*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b^4*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(c g+d g x\right)^3 \left(A+B \ln\left(e \left(\frac{a+b x}{c+d x}\right)^n\right)\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*g + d*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.40 $\int(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=361

$$\frac{2Bg^2n(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2Bg^2n(a+bx)(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3}-\frac{Bg}{}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g^2*n^2*x/b^2-2/3*B*(-a*d+b*c)^2*g^2*n*(b*x+a)*(A+B*ln
(e*((b*x+a)/(d*x+c))^n))/b^3-1/3*B*(-a*d+b*c)*g^2*n*(d*x+c)^2*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/b/d+1/3*g^2*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/
d+1/3*B^2*(-a*d+b*c)^3*g^2*n^2*ln((b*x+a)/(d*x+c))/b^3/d+B^2*(-a*d+b*c)^3*g
^2*n^2*ln(d*x+c)/b^3/d+2/3*B*(-a*d+b*c)^3*g^2*n*(A+B*ln(e*((b*x+a)/(d*x+c))
^n))*ln(1-b*(d*x+c)/d/(b*x+a))/b^3/d-2/3*B^2*(-a*d+b*c)^3*g^2*n^2*polylog(2
,b*(d*x+c)/d/(b*x+a))/b^3/d
```

Rubi [**A**] time = 0.57, antiderivative size = 454, normalized size of antiderivative = 1.26, number of steps used = 19, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{2B^2g^2n^2(bc-ad)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3d}-\frac{2Bg^2n(bc-ad)^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2ABg^2nx(bc-}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^2*g^2*n*x)/(3*b^2) + (B^2*(b*c - a*d)^2*g^2*n^2*x)/(3*b
^2) + (B^2*(b*c - a*d)^3*g^2*n^2*Log[a + b*x])/(3*b^3*d) + (B^2*(b*c - a*d)
^3*g^2*n^2*Log[a + b*x]^2)/(3*b^3*d) - (2*B^2*(b*c - a*d)^2*g^2*n*(a + b*x)
*Log[e*((a + b*x)/(c + d*x))^n])/(3*b^3) - (B*(b*c - a*d)*g^2*n*(c + d*x)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*d) - (2*B*(b*c - a*d)^3*g^2*n
*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3*d) + (g^2*(c +
 d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*d) + (2*B^2*(b*c - a*d
)^3*g^2*n^2*Log[c + d*x])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*g^2*n^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*g^2*n
^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{(2Bn)\int \frac{(bc-ad)g^3(c+dx)^2(A+}{a+b}}{3dg}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{\left(2B(bc-ad)g^2n\right)\int \frac{(c+dx}{}}{3d}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{\left(2B(bc-ad)g^2n\right)\int \Bigg(\frac{d(bc-}{}}{}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{\left(2B(bc-ad)g^2n\right)\int (c+d}{}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} - \frac{B(bc-ad)g^2n(c+dx)^2\Bigg(A+B\log\Bigg(e\Bigg(\frac{a+}{c+}}{3bd}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} - \frac{2B^2(bc-ad)^2g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3b^3}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} - \frac{2B^2(bc-ad)^2g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3b^3}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2} + \frac{B^2(bc-ad)^3g^2n^2\,l}{3b^3d}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2} + \frac{B^2(bc-ad)^3g^2n^2\,l}{3b^3d}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2} + \frac{B^2(bc-ad)^3g^2n^2\,l}{3b^3d}$$

Mathematica [A] time = 0.24, size = 303, normalized size = 0.84

$$g^2\Bigg((c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn(bc-ad)\Big(b^2(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2(bc-ad)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2Abdx}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^2*((c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*
x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[a + b*
x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c + d*x
] - B*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))))/b^3))/(3*d)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^{2}d^{2}g^{2}x^{2} + 2\,A^{2}cdg^{2}x + A^{2}c^{2}g^{2} + \left(B^{2}d^{2}g^{2}x^{2} + 2\,B^{2}cdg^{2}x + B^{2}c^{2}g^{2}\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2} + 2\,\left(ABd^{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^2*g^2*x^2 + 2*A^2*c*d*g^2*x + A^2*c^2*g^2 + (B^2*d^2*g^2*x^2
 + 2*B^2*c*d*g^2*x + B^2*c^2*g^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B
*d^2*g^2*x^2 + 2*A*B*c*d*g^2*x + A*B*c^2*g^2)*log(e*((b*x + a)/(d*x + c))^n
), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.26, size = 0, normalized size = 0.00

$$\int \left(dgx+cg\right)^{2}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((d*g*x+c*g)^2*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 5.75, size = 1473, normalized size = 4.08

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/3*A*B*d^2*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*d^2*g^
2*x^3 + 2*A*B*c*d*g^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*d*
g^2*x^2 + 1/3*A*B*d^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*
c*d*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d
)) + 2*A*B*c^2*g^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c^2*g^2*
```

```
x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c^2*g^2*x - 1/3*(5*a*b*c^2*d
*g^2*n^2 - 2*a^2*c*d^2*g^2*n^2 - (3*g^2*n^2 - 2*g^2*n*log(e))*b^2*c^3)*B^2*
log(d*x + c)/(b^2*d) - 2/3*(b^3*c^3*g^2*n^2 - 3*a*b^2*c^2*d*g^2*n^2 + 3*a^2
*b*c*d^2*g^2*n^2 - a^3*d^3*g^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d) + 1/3*(B^2*b^3*d
^3*g^2*x^3*log(e)^2 + 2*B^2*b^3*c^3*g^2*n^2*log(b*x + a)*log(d*x + c) - B^2
*b^3*c^3*g^2*n^2*log(d*x + c)^2 + (a*b^2*d^3*g^2*n*log(e) - (g^2*n*log(e) -
 3*g^2*log(e)^2)*b^3*c*d^2)*B^2*x^2 - (3*a*b^2*c^2*d*g^2*n^2 - 3*a^2*b*c*d^
2*g^2*n^2 + a^3*d^3*g^2*n^2)*B^2*log(b*x + a)^2 + ((g^2*n^2 - 4*g^2*n*log(e
) + 3*g^2*log(e)^2)*b^3*c^2*d - 2*(g^2*n^2 - 3*g^2*n*log(e))*a*b^2*c*d^2 +
(g^2*n^2 - 2*g^2*n*log(e))*a^2*b*d^3)*B^2*x - (2*(2*g^2*n^2 - 3*g^2*n*log(e
))*a*b^2*c^2*d - (7*g^2*n^2 - 6*g^2*n*log(e))*a^2*b*c*d^2 + (3*g^2*n^2 - 2*
g^2*n*log(e))*a^3*d^3)*B^2*log(b*x + a) + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*
c*d^2*g^2*x^2 + 3*B^2*b^3*c^2*d*g^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*g^
2*x^3 + 3*B^2*b^3*c*d^2*g^2*x^2 + 3*B^2*b^3*c^2*d*g^2*x)*log((d*x + c)^n)^2
 + (2*B^2*b^3*d^3*g^2*x^3*log(e) - 2*B^2*b^3*c^3*g^2*n*log(d*x + c) + (a*b^
2*d^3*g^2*n - (g^2*n - 6*g^2*log(e))*b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*
g^2*n - a^2*b*d^3*g^2*n - (2*g^2*n - 3*g^2*log(e))*b^3*c^2*d)*B^2*x + 2*(3*
a*b^2*c^2*d*g^2*n - 3*a^2*b*c*d^2*g^2*n + a^3*d^3*g^2*n)*B^2*log(b*x + a))*
log((b*x + a)^n) - (2*B^2*b^3*d^3*g^2*x^3*log(e) - 2*B^2*b^3*c^3*g^2*n*log(
d*x + c) + (a*b^2*d^3*g^2*n - (g^2*n - 6*g^2*log(e))*b^3*c*d^2)*B^2*x^2 + 2
*(3*a*b^2*c*d^2*g^2*n - a^2*b*d^3*g^2*n - (2*g^2*n - 3*g^2*log(e))*b^3*c^2*
d)*B^2*x + 2*(3*a*b^2*c^2*d*g^2*n - 3*a^2*b*c*d^2*g^2*n + a^3*d^3*g^2*n)*B^
2*log(b*x + a) + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*c*d^2*g^2*x^2 + 3*B^2*b
^3*c^2*d*g^2*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(c g + d g x\right)^2 \left(A + B \ln\left(e \left(\frac{a + b x}{c + d x}\right)^n\right)\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*g + d*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.41 $\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=220

$$\frac{Bgn(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}-\frac{Bgn(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2}+\frac{g(c+}{}$$

```
[Out] -B*(-a*d+b*c)*g*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2+1/2*g*(d*x+c)
^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d+B^2*(-a*d+b*c)^2*g*n^2*ln(d*x+c)/b^2
/d+B*(-a*d+b*c)^2*g*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-b*(d*x+c)/d/(b*x
+a))/b^2/d-B^2*(-a*d+b*c)^2*g*n^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b^2/d
```

Rubi [A] time = 0.42, antiderivative size = 307, normalized size of antiderivative = 1.40, number of steps used = 15, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2gn^2(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2d}-\frac{Bgn(bc-ad)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}+\frac{g(c+dx)^2\left(B\,\text{lo}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*n*x)/b) + (B^2*(b*c - a*d)^2*g*n^2*Log[a + b*x]^2)/(2*
b^2*d) - (B^2*(b*c - a*d)*g*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b^2
 - (B*(b*c - a*d)^2*g*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(b^2*d) + (g*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d)
+ (B^2*(b*c - a*d)^2*g*n^2*Log[c + d*x])/(b^2*d) - (B^2*(b*c - a*d)^2*g*n^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*d) - (B^2*(b*c - a*d)^2*
g*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(Bn)\int \frac{(bc-ad)g^2(c+dx)\left(A+B\right.}{a+bx}}{dg}$$

$$= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(B(bc-ad)gn)\int \frac{(c+dx)\left(\right.}{}}{d}$$

$$= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(B(bc-ad)gn)\int\left(\frac{d\left(A+B\right.}{}\right.}{}$$

$$= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(B(bc-ad)gn)\int\left(A+B\right.}{b}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B(bc-ad)^2gn\log(a+bx)\left(A+B\log\left(e\left(\right.\right.\right.}{b^2d}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{B}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{B}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{B}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} + \frac{B^2(bc-ad)^2gn^2\log^2(a+bx)}{2b^2d} - \frac{B^2(bc-a}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} + \frac{B^2(bc-ad)^2gn^2\log^2(a+bx)}{2b^2d} - \frac{B^2(bc-a}{}$$

Mathematica [A] time = 0.21, size = 216, normalized size = 0.98

$$\frac{g\left(\frac{Bn(bc-ad)\left(-2(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)-2\left(Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn(ad-bc)\log(c+dx)+Abdx\right)+2Bn(ad-b\right.}{b^2}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g*((c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)*n
*(B*(b*c - a*d)*n*Log[a + b*x]^2 - 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) - 2*(b*c - a*d)*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(b*c -
 a*d)]) + 2*B*(-(b*c) + a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b
^2))/(2*d)
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2dgx + A^2cg + \left(B^2dgx + B^2cg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABdgx + ABcg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*d*g*x + A^2*c*g + (B^2*d*g*x + B^2*c*g)*log(e*((b*x + a)/(d*x
+ c))^n)^2 + 2*(A*B*d*g*x + A*B*c*g)*log(e*((b*x + a)/(d*x + c))^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] Timed out
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int \left(dgx + cg\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((d*g*x+c*g)*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 4.37, size = 825, normalized size = 3.75

$$ABdgx^2\log\left(e\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^n\right) + \frac{1}{2}A^2dgx^2 - ABdgn\left(\frac{a^2\log(bx+a)}{b^2} - \frac{c^2\log(dx+c)}{d^2} + \frac{(bc-ad)x}{bd}\right) + 2\,ABcg$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] A*B*d*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*d*g*x^2 - A*B*
d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
 2*A*B*c*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c*g*x*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n) + A^2*c*g*x - (a*c*d*g*n^2 - (g*n^2 - g*n*log(
e))*b*c^2)*B^2*log(d*x + c)/(b*d) - (b^2*c^2*g*n^2 - 2*a*b*c*d*g*n^2 + a^2*
d^2*g*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x
 + a*d)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(2*B^2*b^2*c^2*g*n^2*log(b*x + a)*l
og(d*x + c) - B^2*b^2*c^2*g*n^2*log(d*x + c)^2 + B^2*b^2*d^2*g*x^2*log(e)^2
 - (2*a*b*c*d*g*n^2 - a^2*d^2*g*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*g*n*lo
g(e) - (g*n*log(e) - g*log(e)^2)*b^2*c*d)*B^2*x - 2*((g*n^2 - 2*g*n*log(e))
*a*b*c*d - (g*n^2 - g*n*log(e))*a^2*d^2)*B^2*log(b*x + a) + (B^2*b^2*d^2*g*
x^2 + 2*B^2*b^2*c*d*g*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^
2*c*d*g*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*g*x^2*log(e) - B^2*b^2*c^2*g
*n*log(d*x + c) + (a*b*d^2*g*n - (g*n - 2*g*log(e))*b^2*c*d)*B^2*x + (2*a*b
*c*d*g*n - a^2*d^2*g*n)*B^2*log(b*x + a))*log((b*x + a)^n) - 2*(B^2*b^2*d^2
*g*x^2*log(e) - B^2*b^2*c^2*g*n*log(d*x + c) + (a*b*d^2*g*n - (g*n - 2*g*lo
```

```
g(e))*b^2*c*d)*B^2*x + (2*a*b*c*d*g*n - a^2*d^2*g*n)*B^2*log(b*x + a) + (B^
2*b^2*d^2*g*x^2 + 2*B^2*b^2*c*d*g*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b
^2*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(c\,g+d\,g\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*g + d*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int A^{2}c\,dx + \int A^{2}dx\,dx + \int B^{2}c\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n}\right)}^{2}\,dx + \int 2ABc\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] g*(Integral(A**2*c, x) + Integral(A**2*d*x, x) + Integral(B**2*c*log(e*(a/(
c + d*x) + b*x/(c + d*x))**n)**2, x) + Integral(2*A*B*c*log(e*(a/(c + d*x)
+ b*x/(c + d*x))**n), x) + Integral(B**2*d*x*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)**2, x) + Integral(2*A*B*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**
n), x))
```

3.42 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{cg+dgx}\,dx$

Optimal. Leaf size=137

$$-\frac{2Bn\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{dg}+\frac{2B^2n^2\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)}{dg}$$

```
[Out] -(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b*c)/b/(d*x+c))/d/g-2*B*n*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/d/g+2*B^2*n^2*pol
ylog(3,d*(b*x+a)/b/(d*x+c))/d/g
```

Rubi **[B]** time = 3.30, antiderivative size = 782, normalized size of antiderivative = 5.71, number of steps used = 45, number of rules used = 23, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.657, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

$$-\frac{2ABn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg}+\frac{2B^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)\left(-\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\log\left((a+bx)^n\right)+\log\left((c+dx)^{-n}\right)\right)}{dg}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x),x]
```

```
[Out] (B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d*g) - (B^2*Log[(a
 + b*x)^n]^2*Log[g*(c + d*x)])/(d*g) + (A*B*n*Log[g*(c + d*x)]^2)/(d*g) - (
B^2*n^2*Log[a + b*x]*Log[g*(c + d*x)]^2)/(d*g) + (B^2*n^2*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[g*(c + d*x)]^2)/(d*g) + (B^2*n^2*Log[g*(c + d*x)]^3)/(
3*d*g) - (2*B^2*n*Log[a + b*x]*Log[g*(c + d*x)]*Log[(c + d*x)^(-n)])/(d*g)
- (B^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d*g) + (B^2*Log[-((d*(a + b*x))
/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d*g) - (2*A*B*n*Log[-((d*(a + b*x))/
(b*c - a*d))]*Log[c*g + d*g*x])/(d*g) + ((A + B*Log[e*((a + b*x)/(c + d*x))
^n])^2*Log[c*g + d*g*x])/(d*g) + (2*B^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]
*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*
Log[c*g + d*g*x])/(d*g) - (B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*
g + d*g*x]^2)/(d*g) + (B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c*g + d*g*x
]^2)/(d*g) + (2*B^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/(d*g) - (2*A*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g) - (2*B^
2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g) + (2*B
^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n
)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g) - (2*B^2*n^2*PolyLog[3, -(
(d*(a + b*x))/(b*c - a*d))])/(d*g) - (2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b
*c - a*d)])/(d*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{cg+dgx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \frac{(c+dx)\bigl(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\bigr)\bigl(A+B\log\bigl(e\bigl(}{a+bx}}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \frac{(bc-ad)\bigl(A+B\log\bigl(e\bigl(\frac{a+bx}{c+dx}\bigr)^n\bigr)\bigr)\log(cg}{(a+bx)(c+dx)}}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2B(bc-ad)n)\int \frac{\bigl(A+B\log\bigl(e\bigl(\frac{a+bx}{c+dx}\bigr)^n\bigr)\bigr)\,\mathrm{lo}}{(a+bx)(c+dx)}}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2B(bc-ad)n)\int \Biggl(\frac{d\bigl(-A-B\log\bigl(e\bigl(\frac{a+bx}{c+dx}\bigr)^n}{(bc-ad)(c+}}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \frac{\bigl(-A-B\log\bigl(e\bigl(\frac{a+bx}{c+dx}\bigr)^n\bigr)\bigr)\log(cg+dgx)}{c+dx}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \Biggl(\frac{A\log(cg+dgx)}{-c-dx}+\frac{B\log\bigl(e\bigl(\frac{a+bx}{c+dx}\bigr)^n}{-c-}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2ABn)\int \frac{\log(cg+dgx)}{-c-dx}\,dx}{g} - \frac{\left(2B^2n\right)\int}{}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx}{dg}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx}{dg}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\log^2(g(c+dx))}{dg} - \frac{2B^2n\log(a+bx}{}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\,\mathrm{lo}}{}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\,\mathrm{lo}}{}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\,\mathrm{lo}}{}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\,\mathrm{lo}}{}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\,\mathrm{lo}}{}$$

Mathematica [B] time = 0.41, size = 537, normalized size = 3.92

$$-3Bn\left(-2\left(\mathrm{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)+\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2\log(c+dx)\left(-\log\left(\frac{a+bx}{c+dx}\right)+\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)\right)\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x),x]
```

```
[Out] (3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*
Log[c + d*x] - 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b
*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a +
 b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a
*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + B^2*n^2*(Log[c/d + x]^3
 + 3*Log[c/d + x]^2*(-Log[a/b + x] + Log[(d*(a + b*x))/(-(b*c) + a*d)]) + 3
*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] +
 3*Log[a/b + x]^2*Log[(b*(c + d*x))/(b*c - a*d)] + 6*Log[a/b + x]*PolyLog[2
, (d*(a + b*x))/(-(b*c) + a*d)] + 3*(Log[a/b + x] - Log[c/d + x] - Log[(a +
 b*x)/(c + d*x)])*(Log[c/d + x]^2 - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c
- a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + 6*Log[c/d + x]*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)] - 6*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d
)] - 6*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]))/(3*d*g)
```

fricas [F] time = 0.96, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2}{dgx+cg},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(d*g*x + c*g), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x, algorithm="giac
")
```

```
[Out] Timed out
```

maple [F] time = 0.30, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{dgx+cg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g),x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{B^2 \log(dx+c)\log\left((dx+c)^n\right)^2}{dg}+\frac{A^2\log\left(dgx+cg\right)}{dg}-\int -\frac{B^2\log\left((bx+a)^n\right)^2+B^2\log(e)^2+2\,AB\log(e)+2\left(B^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x, algorithm="maxi
ma")
```

```
[Out] B^2*log(d*x + c)*log((d*x + c)^n)^2/(d*g) + A^2*log(d*g*x + c*g)/(d*g) - in
tegrate(-(B^2*log((b*x + a)^n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log
(e) + A*B)*log((b*x + a)^n) - 2*(B^2*n*log(d*x + c) + B^2*log((b*x + a)^n)
+ B^2*log(e) + A*B)*log((d*x + c)^n))/(d*g*x + c*g), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{c\,g+d\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*g + d*g*x),x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*g + d*g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c+dx}\,dx+\int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c+dx}\,dx+\int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g),x)
```

```
[Out] (Integral(A**2/(c + d*x), x) + Integral(B**2*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)**2/(c + d*x), x) + Integral(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d
*x))**n)/(c + d*x), x))/g
```

3.43 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^2}\,dx$

Optimal. Leaf size=163

$$\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2(c+dx)(bc-ad)}-\frac{2ABn(a+bx)}{g^2(c+dx)(bc-ad)}-\frac{2B^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^2(c+dx)(bc-ad)}+\frac{2B^2n^2(a+bx)}{g^2(c+dx)(bc-ad)}$$

```
[Out] -2*A*B*n*(b*x+a)/(-a*d+b*c)/g^2/(d*x+c)+2*B^2*n^2*(b*x+a)/(-a*d+b*c)/g^2/(d
*x+c)-2*B^2*n*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)/g^2/(d*x+c)+(b*x
+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)/g^2/(d*x+c)
```

Rubi [C] time = 0.77, antiderivative size = 514, normalized size of antiderivative = 3.15, number of steps used = 24, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2bB^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{dg^2(bc-ad)}+\frac{2bB^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg^2(bc-ad)}+\frac{2bBn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg^2(bc-ad)}+2Bn$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^2,x]
```

```
[Out] (-2*B^2*n^2)/(d*g^2*(c + d*x)) - (2*b*B^2*n^2*Log[a + b*x])/(d*(b*c - a*d)*
g^2) - (b*B^2*n^2*Log[a + b*x]^2)/(d*(b*c - a*d)*g^2) + (2*B*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(d*g^2*(c + d*x)) + (2*b*B*n*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*(b*c - a*d)*g^2) - (A + B*Log[e*((a +
 b*x)/(c + d*x))^n])^2/(d*g^2*(c + d*x)) + (2*b*B^2*n^2*Log[c + d*x])/(d*(b
*c - a*d)*g^2) + (2*b*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x
])/(d*(b*c - a*d)*g^2) - (2*b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[c + d*x])/(d*(b*c - a*d)*g^2) - (b*B^2*n^2*Log[c + d*x]^2)/(d*(b*c - a*d)
*g^2) + (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d*(b*c -
 a*d)*g^2) + (2*b*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d*(b*c
 - a*d)*g^2) + (2*b*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*(b*c
- a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^2}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(a+bx)(c+dx)^2}\,dx}{dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^2}\,dx}{dg^2}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} + \frac{(2B(bc-ad)n)\int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B\right.}{(bc-}\right.}{dg^2}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} - \frac{(2Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}\,dx}{g^2} - \frac{(2bBn)\int \frac{A+B\log}{c}}{(bc-ad}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^2} -$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^2} -$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^2} -$$

$$= -\frac{2B^2n^2}{dg^2(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{d(bc-ad)g^2} + \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn}{}$$

$$= -\frac{2B^2n^2}{dg^2(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{d(bc-ad)g^2} - \frac{bB^2n^2\log^2(a+bx)}{d(bc-ad)g^2} + \frac{2Bn\left(A+B\log\right.}{dg^2(c}$$

$$= -\frac{2B^2n^2}{dg^2(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{d(bc-ad)g^2} - \frac{bB^2n^2\log^2(a+bx)}{d(bc-ad)g^2} + \frac{2Bn\left(A+B\log\right.}{dg^2(c}$$

Mathematica [C] time = 0.43, size = 331, normalized size = 2.03

$$\frac{Bn\left(2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2b(c+dx)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-2b(c+dx)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-bBn(c+dx)\left(\log(a+bx)\right(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^2,x]
```

```
[Out] (-(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*
Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*n*
```

```
(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(d*g^2*(c + d*x
))
```

fricas [A] time = 0.91, size = 263, normalized size = 1.61

$$-\frac{A^2bc - A^2ad + 2\left(B^2bc - B^2ad\right)n^2 + \left(B^2bc - B^2ad\right)\log(e)^2 - \left(B^2bdn^2x + B^2adn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^2 - 2\left(ABbc - AB\right.}{\left(bc\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x, algorithm="fr
icas")
```

```
[Out] -(A^2*b*c - A^2*a*d + 2*(B^2*b*c - B^2*a*d)*n^2 + (B^2*b*c - B^2*a*d)*log(e
)^2 - (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(A*B*b*c
 - A*B*a*d)*n + 2*(A*B*b*c - A*B*a*d - (B^2*b*c - B^2*a*d)*n - (B^2*b*d*n*x
 + B^2*a*d*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*(B^2*a*d*n^2 - A*B*a*d*n
 + (B^2*b*d*n^2 - A*B*b*d*n)*x)*log((b*x + a)/(d*x + c)))/((b*c*d^2 - a*d^3
)*g^2*x + (b*c^2*d - a*c*d^2)*g^2)
```

giac [A] time = 7.26, size = 164, normalized size = 1.01

$$\left(\frac{(bx+a)B^2n^2\log\left(\frac{bx+a}{dx+c}\right)^2}{(dx+c)g^2} - \frac{2\left(B^2n^2 - ABn - B^2n\right)(bx+a)\log\left(\frac{bx+a}{dx+c}\right)}{(dx+c)g^2} + \frac{\left(2B^2n^2 - 2ABn - 2B^2n + A^2 + 2AB\right.}{(dx+c)g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x, algorithm="gi
ac")
```

```
[Out] ((b*x + a)*B^2*n^2*log((b*x + a)/(d*x + c))^2/((d*x + c)*g^2) - 2*(B^2*n^2
- A*B*n - B^2*n)*(b*x + a)*log((b*x + a)/(d*x + c))/((d*x + c)*g^2) + (2*B^
2*n^2 - 2*A*B*n - 2*B^2*n + A^2 + 2*A*B + B^2)*(b*x + a)/((d*x + c)*g^2))*(
b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}{\left(dgx+cg\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^2,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^2,x)
```

maxima [B] time = 0.86, size = 428, normalized size = 2.63

$$2ABn\left(\frac{1}{d^2g^2x + cdg^2} + \frac{b\log(bx+a)}{\left(bcd - ad^2\right)g^2} - \frac{b\log(dx+c)}{\left(bcd - ad^2\right)g^2}\right) + \left(2n\left(\frac{1}{d^2g^2x + cdg^2} + \frac{b\log(bx+a)}{\left(bcd - ad^2\right)g^2} - \frac{b\log(dx+c)}{\left(bcd - ad^2\right)g^2}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x, algorithm="ma
xima")
```

```
[Out] 2*A*B*n*(1/(d^2*g^2*x + c*d*g^2) + b*log(b*x + a)/((b*c*d - a*d^2)*g^2) - b
*log(d*x + c)/((b*c*d - a*d^2)*g^2)) + (2*n*(1/(d^2*g^2*x + c*d*g^2) + b*lo
g(b*x + a)/((b*c*d - a*d^2)*g^2) - b*log(d*x + c)/((b*c*d - a*d^2)*g^2))*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n) - ((b*d*x + b*c)*log(b*x + a)^2 + (b*d
*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2
*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*n^2/(b*c^2*d*g^2
- a*c*d^2*g^2 + (b*c*d^2*g^2 - a*d^3*g^2)*x))*B^2 - B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(d^2*g^2*x + c*d*g^2) - 2*A*B*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n)/(d^2*g^2*x + c*d*g^2) - A^2/(d^2*g^2*x + c*d*g^2)
```

mupad **[B]** time = 5.65, size = 237, normalized size = 1.45

$$\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\left(\frac{2\,B^2\,n}{x\,d^2\,g^2+c\,d\,g^2}-\frac{2\,A\,B}{x\,d^2\,g^2+c\,d\,g^2}\right)-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\left(\frac{B^2}{d\,\left(c\,g^2+d\,g^2\,x\right)}+\frac{B^2\,b}{d\,g^2\,\left(a\,d-b\,c\right)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*g + d*g*x)^2,x)
```

```
[Out] log(e*((a + b*x)/(c + d*x))^n)*((2*B^2*n)/(d^2*g^2*x + c*d*g^2) - (2*A*B)/(
d^2*g^2*x + c*d*g^2)) - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(d*(c*g^2 + d
*g^2*x)) + (B^2*b)/(d*g^2*(a*d - b*c))) - (A^2 + 2*B^2*n^2 - 2*A*B*n)/(d^2*
g^2*x + c*d*g^2) + (B*b*n*atan(((2*b*d*x + (a*d^2*g^2 + b*c*d*g^2)/(d*g^2))
*1i)/(a*d - b*c))*(A - B*n)*4i)/(d*g^2*(a*d - b*c))
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c^2+2cdx+d^2x^2}\,dx+\int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^2+2cdx+d^2x^2}\,dx+\int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^2+2cdx+d^2x^2}\,dx}{g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**2,x)
```

```
[Out] (Integral(A**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral(B**2*log(e*(a/(c
 + d*x) + b*x/(c + d*x))**n)**2/(c**2 + 2*c*d*x + d**2*x**2), x) + Integral
(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**2 + 2*c*d*x + d**2*x**2)
, x))/g**2
```

3.44 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^3}\,dx$

Optimal. Leaf size=317

$$\frac{Bdn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3(c+dx)^2(bc-ad)^2}-$$

```
[Out] -1/4*B^2*d*n^2*(b*x+a)^2/(-a*d+b*c)^2/g^3/(d*x+c)^2-2*A*b*B*n*(b*x+a)/(-a*d
+b*c)^2/g^3/(d*x+c)+2*b*B^2*n^2*(b*x+a)/(-a*d+b*c)^2/g^3/(d*x+c)-2*b*B^2*n*
(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/(-a*d+b*c)^2/g^3/(d*x+c)+1/2*B*d*n*(b*x+a
)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^2/g^3/(d*x+c)^2-1/2*d*(b*x+a
)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^3/(d*x+c)^2+b*(b*x+a)*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*d+b*c)^2/g^3/(d*x+c)
```

Rubi [C] time = 0.92, antiderivative size = 626, normalized size of antiderivative = 1.97, number of steps used = 28, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{dg^3(bc-ad)^2}+\frac{b^2B^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg^3(bc-ad)^2}+\frac{b^2Bn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg^3(bc-ad)^2}-b^2Bn\log$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^3,x]
```

```
[Out] -(B^2*n^2)/(4*d*g^3*(c + d*x)^2) - (3*b*B^2*n^2)/(2*d*(b*c - a*d)*g^3*(c +
d*x)) - (3*b^2*B^2*n^2*Log[a + b*x])/(2*d*(b*c - a*d)^2*g^3) - (b^2*B^2*n^2
*Log[a + b*x]^2)/(2*d*(b*c - a*d)^2*g^3) + (B*n*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(2*d*g^3*(c + d*x)^2) + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(d*(b*c - a*d)*g^3*(c + d*x)) + (b^2*B*n*Log[a + b*x]*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(d*(b*c - a*d)^2*g^3) - (A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2/(2*d*g^3*(c + d*x)^2) + (3*b^2*B^2*n^2*Log[c + d*x])/(2*d
*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/(d*(b*c - a*d)^2*g^3) - (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[c + d*x])/(d*(b*c - a*d)^2*g^3) - (b^2*B^2*n^2*Log[c + d*x]^2)/(2*
d*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(d*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
- a*d))])/(d*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/(d*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^3}\,dx &= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2}+\frac{(Bn)\int\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^2(a+bx)(c+dx)^3}\,dx}{dg}\\
&= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2}+\frac{(B(bc-ad)n)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^3}\,dx}{dg^3}\\
&= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2}+\frac{(B(bc-ad)n)\int\Bigg(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3(a+bx)}-\frac{d\Big(A+B\log\Big(e}{(bc-ad)(c}}{}\\
&= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2}-\frac{(Bn)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3}\,dx}{g^3}-\frac{\left(b^2Bn\right)\int\frac{A+B\log\Big(e\Big(\frac{a\text{-}}{c\text{+}}}{c+dx}}{(bc-ad)^2g^3}\\
&= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2dg^3(c+dx)^2}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^3(c+dx)}+\frac{b^2Bn\log(a+bx}{d(}\\
&= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2dg^3(c+dx)^2}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^3(c+dx)}+\frac{b^2Bn\log(a+bx}{d(}\\
&= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2dg^3(c+dx)^2}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^3(c+dx)}+\frac{b^2Bn\log(a+bx}{d(}\\
&= -\frac{B^2n^2}{4dg^3(c+dx)^2}-\frac{3bB^2n^2}{2d(bc-ad)g^3(c+dx)}-\frac{3b^2B^2n^2\log(a+bx)}{2d(bc-ad)^2g^3}+\frac{Bn\Big(A+B\,\mathrm{l}}{2dg^3}\\
&= -\frac{B^2n^2}{4dg^3(c+dx)^2}-\frac{3bB^2n^2}{2d(bc-ad)g^3(c+dx)}-\frac{3b^2B^2n^2\log(a+bx)}{2d(bc-ad)^2g^3}-\frac{b^2B^2n^2\log^2}{2d(bc-a}\\
&= -\frac{B^2n^2}{4dg^3(c+dx)^2}-\frac{3bB^2n^2}{2d(bc-ad)g^3(c+dx)}-\frac{3b^2B^2n^2\log(a+bx)}{2d(bc-ad)^2g^3}-\frac{b^2B^2n^2\log^2}{2d(bc-a}
\end{aligned}
$$

Mathematica [C] time = 0.44, size = 464, normalized size = 1.46

$$
\frac{Bn\Big(4b^2(c+dx)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-4b^2(c+dx)^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+4b(c+dx)(bc-ad)\Big(B\,\mathrm{lo}}{}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^3,x]
```

```
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x
```

```
] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d
*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*
b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(c + d*x
)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*g^3*(c + d*x)^
2)
```

fricas [B] time = 1.08, size = 654, normalized size = 2.06

$$-\frac{2\,A^2b^2c^2-4\,A^2abcd+2\,A^2a^2d^2+\left(7\,B^2b^2c^2-8\,B^2abcd+B^2a^2d^2\right)n^2+2\left(B^2b^2c^2-2\,B^2abcd+B^2a^2d^2\right)\log(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/4*(2*A^2*b^2*c^2 - 4*A^2*a*b*c*d + 2*A^2*a^2*d^2 + (7*B^2*b^2*c^2 - 8*B^
2*a*b*c*d + B^2*a^2*d^2)*n^2 + 2*(B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2
)*log(e)^2 - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*b^2*c*d*n^2*x + (2*B^2*a*b*c*d
- B^2*a^2*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(3*A*B*b^2*c^2 - 4*A*B*a
*b*c*d + A*B*a^2*d^2)*n + 2*(3*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2 - 2*(A*B*b^2
*c*d - A*B*a*b*d^2)*n)*x + 2*(2*A*B*b^2*c^2 - 4*A*B*a*b*c*d + 2*A*B*a^2*d^2
 - 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n*x - (3*B^2*b^2*c^2 - 4*B^2*a*b*c*d + B^2
*a^2*d^2)*n - 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*b^2*c*d*n*x + (2*B^2*a*b*c*d - B
^2*a^2*d^2)*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*((4*B^2*a*b*c*d - B^2*a
^2*d^2)*n^2 + (3*B^2*b^2*d^2*n^2 - 2*A*B*b^2*d^2*n)*x^2 - 2*(2*A*B*a*b*c*d
- A*B*a^2*d^2)*n - 2*(2*A*B*b^2*c*d*n - (2*B^2*b^2*c*d + B^2*a*b*d^2)*n^2)*
x)*log((b*x + a)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*g^3*x^2
 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*g^3*x + (b^2*c^4*d - 2*a*b*c
^3*d^2 + a^2*c^2*d^3)*g^3)
```

giac [A] time = 9.30, size = 387, normalized size = 1.22

$$\frac{1}{4}\left(2\left(\frac{2\,(bx+a)B^2bn^2}{\left(bcg^3-adg^3\right)(dx+c)}-\frac{(bx+a)^2B^2dn^2}{\left(bcg^3-adg^3\right)(dx+c)^2}\right)\log\left(\frac{bx+a}{dx+c}\right)^2+2\left(\frac{\left(B^2dn^2-2\,ABdn-2\,B^2dn\right)(bx+a}{\left(bcg^3-adg^3\right)(dx+c)^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x, algorithm="gi
ac")
```

```
[Out] 1/4*(2*(2*(b*x + a)*B^2*b*n^2/((b*c*g^3 - a*d*g^3)*(d*x + c)) - (b*x + a)^2
*B^2*d*n^2/((b*c*g^3 - a*d*g^3)*(d*x + c)^2))*log((b*x + a)/(d*x + c))^2 +
2*((B^2*d*n^2 - 2*A*B*d*n - 2*B^2*d*n)*(b*x + a)^2/((b*c*g^3 - a*d*g^3)*(d*
x + c)^2) - 4*(B^2*b*n^2 - A*B*b*n - B^2*b*n)*(b*x + a)/((b*c*g^3 - a*d*g^3
)*(d*x + c)))*log((b*x + a)/(d*x + c)) - (B^2*d*n^2 - 2*A*B*d*n - 2*B^2*d*n
 + 2*A^2*d + 4*A*B*d + 2*B^2*d)*(b*x + a)^2/((b*c*g^3 - a*d*g^3)*(d*x + c)^
2) + 4*(2*B^2*b*n^2 - 2*A*B*b*n - 2*B^2*b*n + A^2*b + 2*A*B*b + B^2*b)*(b*x
 + a)/((b*c*g^3 - a*d*g^3)*(d*x + c)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)
^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(dgx+cg\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^3,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^3,x)
```

maxima [B] time = 1.23, size = 861, normalized size = 2.72

$$\frac{1}{2}\,ABn\left(\frac{2\,bdx+3\,bc-ad}{\left(bcd^3-ad^4\right)g^3x^2+2\,\left(bc^2d^2-acd^3\right)g^3x+\left(bc^3d-ac^2d^2\right)g^3}+\frac{2\,b^2\log\left(bx+a\right)}{\left(b^2c^2d-2\,abcd^2+a^2d^3\right)g^3}-\frac{2\,b^2\log}{\left(b^2c^2d-2\,a\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*g^3*x^2 + 2*(b*c^2*d^
2 - a*c*d^3)*g^3*x + (b*c^3*d - a*c^2*d^2)*g^3) + 2*b^2*log(b*x + a)/((b^2*
c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*
b*c*d^2 + a^2*d^3)*g^3)) + 1/4*(2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*
d^4)*g^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*g^3*x + (b*c^3*d - a*c^2*d^2)*g^3) +
 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3) - 2*b^2*log(d
*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3))*log(e*(b*x/(d*x + c) + a
/(d*x + c))^n) - (7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*
c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*l
og(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^
2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d
^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d*
g^3 - 2*a*b*c^3*d^2*g^3 + a^2*c^2*d^3*g^3 + (b^2*c^2*d^3*g^3 - 2*a*b*c*d^4*
g^3 + a^2*d^5*g^3)*x^2 + 2*(b^2*c^3*d^2*g^3 - 2*a*b*c^2*d^3*g^3 + a^2*c*d^4
*g^3)*x))*B^2 - 1/2*B^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(d^3*g^3*x
^2 + 2*c*d^2*g^3*x + c^2*d*g^3) - A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(d^3*g^3*x^2 + 2*c*d^2*g^3*x + c^2*d*g^3) - 1/2*A^2/(d^3*g^3*x^2 + 2*c*d^
2*g^3*x + c^2*d*g^3)
```

mupad [B] time = 5.47, size = 505, normalized size = 1.59

$$-\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)^2\,\left(\frac{B^2}{2\,d\,\left(c^2\,g^3+2\,c\,d\,g^3\,x+d^2\,g^3\,x^2\right)}-\frac{B^2\,b^2}{2\,d\,g^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{\frac{2\,A^2\,a\,d-2\,A^2\,b\,c+B^2\,a\,d\,n^2-7}{2\,(a}}{2\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*g + d*g*x)^3,x)
```

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(2*d*(c^2*g^3 + d^2*g^3*x^2 + 2*c*d
*g^3*x)) - (B^2*b^2)/(2*d*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((2*A^2*a
*d - 2*A^2*b*c + B^2*a*d*n^2 - 7*B^2*b*c*n^2 - 2*A*B*a*d*n + 6*A*B*b*c*n)/(
2*(a*d - b*c)) - (b*x*(3*B^2*d*n^2 - 2*A*B*d*n))/(a*d - b*c))/(2*c^2*d*g^3
+ 2*d^3*g^3*x^2 + 4*c*d^2*g^3*x) - log(e*((a + b*x)/(c + d*x))^n)*((A*B)/(c
^2*d*g^3 + d^3*g^3*x^2 + 2*c*d^2*g^3*x) + (B^2*b^2*((d^2*g^3*n*x*(a*d - b*c
))/b - (d*g^3*n*(a*d - b*c)*(a*d - 2*b*c))/(2*b^2) + (c*d*g^3*n*(a*d - b*c)
)/(2*b)))/(d*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(c^2*d*g^3 + d^3*g^3*x^2 +
 2*c*d^2*g^3*x))) - (B*b^2*n*atan(((2*b*d*x + (2*a^2*d^3*g^3 - 2*b^2*c^2*d*
g^3)/(2*d*g^3*(a*d - b*c)))*1i)/(a*d - b*c))*(2*A - 3*B*n)*1i)/(d*g^3*(a*d
- b*c)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx+\int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^3+3c^2dx+3cd^2x^2+d^3x^3}\,dx}{g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**3,x)
```

```
[Out] (Integral(A**2/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x) + Integr
al(B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c**3 + 3*c**2*d*x + 3*c
*d**2*x**2 + d**3*x**3), x) + Integral(2*A*B*log(e*(a/(c + d*x) + b*x/(c +
d*x))**n)/(c**3 + 3*c**2*d*x + 3*c*d**2*x**2 + d**3*x**3), x))/g**3
```

3.45 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^4}\,dx$

Optimal. Leaf size=429

$$\frac{2b^3Bn\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3dg^4(bc-ad)^3}-\frac{2b^2Bn(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4(c+dx)(bc-ad)^3}-\frac{2Bd^2n(a+bx)^3\left(B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{9g^4(c+dx)^3(bc-a}$$

```
[Out] 2/27*B^2*d^2*n^2*(b*x+a)^3/(-a*d+b*c)^3/g^4/(d*x+c)^3-1/2*b*B^2*d*n^2*(b*x+
a)^2/(-a*d+b*c)^3/g^4/(d*x+c)^2+2*b^2*B^2*n^2*(b*x+a)/(-a*d+b*c)^3/g^4/(d*x
+c)-2/9*B*d^2*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^4/
(d*x+c)^3+b*B*d*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/g^
4/(d*x+c)^2-2*b^2*B*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^3/
g^4/(d*x+c)-1/3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d/g^4/(d*x+c)^3+2/3*b^3*B
*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/d/(-a*d+b*c)^3/g^4-1
/3*b^3*B^2*n^2*ln((b*x+a)/(d*x+c))^2/d/(-a*d+b*c)^3/g^4
```

Rubi [C] time = 1.10, antiderivative size = 736, normalized size of antiderivative = 1.72, number of steps used = 32, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.314$, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2b^3B^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3dg^4(bc-ad)^3}+\frac{2b^3B^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3dg^4(bc-ad)^3}+\frac{2b^3Bn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3dg^4(bc-ad)^3}-\frac{2b^3B}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^4,x]
```

```
[Out] (-2*B^2*n^2)/(27*d*g^4*(c + d*x)^3) - (5*b*B^2*n^2)/(18*d*(b*c - a*d)*g^4*(
c + d*x)^2) - (11*b^2*B^2*n^2)/(9*d*(b*c - a*d)^2*g^4*(c + d*x)) - (11*b^3*
B^2*n^2*Log[a + b*x])/(9*d*(b*c - a*d)^3*g^4) - (b^3*B^2*n^2*Log[a + b*x]^2
)/(3*d*(b*c - a*d)^3*g^4) + (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(9*d*g^4*(c + d*x)^3) + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d
*(b*c - a*d)*g^4*(c + d*x)^2) + (2*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(3*d*(b*c - a*d)^2*g^4*(c + d*x)) + (2*b^3*B*n*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(3*d*(b*c - a*d)^3*g^4) - (A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2/(3*d*g^4*(c + d*x)^3) + (11*b^3*B^2*n^2*Log[c + d*
x])/(9*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(3*d*(b*c - a*d)^3*g^4) - (2*b^3*B*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x])/(3*d*(b*c - a*d)^3*g^4) - (b^3*B^2*n^2*Log
[c + d*x]^2)/(3*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(3*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/(3*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*d*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^4}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3}+\frac{(2Bn)\int\frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^3(a+bx)(c+dx)^4}\,dx}{3dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3}+\frac{(2B(bc-ad)n)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^4}\,dx}{3dg^4}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3}+\frac{(2B(bc-ad)n)\int\left(\frac{b^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^4(a+bx)}-\frac{d\left(A+B\log\right.}{(bc-ad)}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3}-\frac{(2Bn)\int\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^4}\,dx}{3g^4}-\frac{\left(2b^3Bn\right)\int\frac{A+B\log\left(e\right.}{c+}}{3(bc-ad)^3}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9dg^4(c+dx)^3}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d(bc-ad)g^4(c+dx)^2}+\frac{2b^2Bn\left(A+B\,\mathrm{l}\right.}{3d(bc-ad}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9dg^4(c+dx)^3}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d(bc-ad)g^4(c+dx)^2}+\frac{2b^2Bn\left(A+B\,\mathrm{l}\right.}{3d(bc-ad}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9dg^4(c+dx)^3}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d(bc-ad)g^4(c+dx)^2}+\frac{2b^2Bn\left(A+B\,\mathrm{l}\right.}{3d(bc-ad}$$

$$= -\frac{2B^2n^2}{27dg^4(c+dx)^3}-\frac{5bB^2n^2}{18d(bc-ad)g^4(c+dx)^2}-\frac{11b^2B^2n^2}{9d(bc-ad)^2g^4(c+dx)}-\frac{11b^3B}{9d}$$

$$= -\frac{2B^2n^2}{27dg^4(c+dx)^3}-\frac{5bB^2n^2}{18d(bc-ad)g^4(c+dx)^2}-\frac{11b^2B^2n^2}{9d(bc-ad)^2g^4(c+dx)}-\frac{11b^3B}{9d}$$

$$= -\frac{2B^2n^2}{27dg^4(c+dx)^3}-\frac{5bB^2n^2}{18d(bc-ad)g^4(c+dx)^2}-\frac{11b^2B^2n^2}{9d(bc-ad)^2g^4(c+dx)}-\frac{11b^3B}{9d}$$

Mathematica [C] time = 0.67, size = 609, normalized size = 1.42

$$\frac{Bn\left(36b^3(c+dx)^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-36b^3(c+dx)^3\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+36b^2(c+dx)^2(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+12(bc-ad\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^4,x]
```

```
[Out] (-18*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(12*(b*c - a*d)^3*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 18*b*(b*c - a*d)^2*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]) + 36*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]) + 36*b^3*(c + d*x)^3*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]) - 36*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])*Log[c + d*x] - 36*b^2*B*n*(c + d*x)^2*(b*c - a*d + b*(c + d*x)*Lo
g[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 9*b*B*n*(c + d*x)*((b*c - a*d)^2 +
 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*
x)^2*Log[c + d*x]) - 2*B*n*(2*(b*c - a*d)^3 + 3*b*(b*c - a*d)^2*(c + d*x) +
 6*b^2*(b*c - a*d)*(c + d*x)^2 + 6*b^3*(c + d*x)^3*Log[a + b*x] - 6*b^3*(c
+ d*x)^3*Log[c + d*x]) - 18*b^3*B*n*(c + d*x)^3*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) + 18*b^3*B*n*(c + d*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c
- a*d)^3)/(54*d*g^4*(c + d*x)^3)
```

<u>**fricas**</u> **[B]**   time = 0.85, size = 1167, normalized size = 2.72

$$-\frac{18\,A^2b^3c^3 - 54\,A^2ab^2c^2d + 54\,A^2a^2bcd^2 - 18\,A^2a^3d^3 + \left(85\,B^2b^3c^3 - 108\,B^2ab^2c^2d + 27\,B^2a^2bcd^2 - 4\,B^2a^3d^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/54*(18*A^2*b^3*c^3 - 54*A^2*a*b^2*c^2*d + 54*A^2*a^2*b*c*d^2 - 18*A^2*a^
3*d^3 + (85*B^2*b^3*c^3 - 108*B^2*a*b^2*c^2*d + 27*B^2*a^2*b*c*d^2 - 4*B^2*
a^3*d^3)*n^2 + 6*(11*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 - 6*(A*B*b^3*c*d^2
 - A*B*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*
b*c*d^2 - B^2*a^3*d^3)*log(e)^2 - 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*b^3*c*d^2
*n^2*x^2 + 3*B^2*b^3*c^2*d*n^2*x + (3*B^2*a*b^2*c^2*d - 3*B^2*a^2*b*c*d^2 +
 B^2*a^3*d^3)*n^2)*log((b*x + a)/(d*x + c))^2 - 6*(11*A*B*b^3*c^3 - 18*A*B*
a*b^2*c^2*d + 9*A*B*a^2*b*c*d^2 - 2*A*B*a^3*d^3)*n + 3*((49*B^2*b^3*c^2*d -
 54*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*n^2 - 6*(5*A*B*b^3*c^2*d - 6*A*B*a*b
^2*c*d^2 + A*B*a^2*b*d^3)*n)*x + 6*(6*A*B*b^3*c^3 - 18*A*B*a*b^2*c^2*d + 18
*A*B*a^2*b*c*d^2 - 6*A*B*a^3*d^3 - 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n*x^2
- 3*(5*B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*n*x - (11*B^2*b^3
*c^3 - 18*B^2*a*b^2*c^2*d + 9*B^2*a^2*b*c*d^2 - 2*B^2*a^3*d^3)*n - 6*(B^2*b
^3*d^3*n*x^3 + 3*B^2*b^3*c*d^2*n*x^2 + 3*B^2*b^3*c^2*d*n*x + (3*B^2*a*b^2*c
^2*d - 3*B^2*a^2*b*c*d^2 + B^2*a^3*d^3)*n)*log((b*x + a)/(d*x + c)))*log(e)
 + 6*((11*B^2*b^3*d^3*n^2 - 6*A*B*b^3*d^3*n)*x^3 + (18*B^2*a*b^2*c^2*d - 9*
B^2*a^2*b*c*d^2 + 2*B^2*a^3*d^3)*n^2 - 3*(6*A*B*b^3*c*d^2*n - (9*B^2*b^3*c*
d^2 + 2*B^2*a*b^2*d^3)*n^2)*x^2 - 6*(3*A*B*a*b^2*c^2*d - 3*A*B*a^2*b*c*d^2
+ A*B*a^3*d^3)*n - 3*(6*A*B*b^3*c^2*d*n - (6*B^2*b^3*c^2*d + 6*B^2*a*b^2*c*
d^2 - B^2*a^2*b*d^3)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^3*c^3*d^4 - 3*a*
b^2*c^2*d^5 + 3*a^2*b*c*d^6 - a^3*d^7)*g^4*x^3 + 3*(b^3*c^4*d^3 - 3*a*b^2*c
^3*d^4 + 3*a^2*b*c^2*d^5 - a^3*c*d^6)*g^4*x^2 + 3*(b^3*c^5*d^2 - 3*a*b^2*c^
4*d^3 + 3*a^2*b*c^3*d^4 - a^3*c^2*d^5)*g^4*x + (b^3*c^6*d - 3*a*b^2*c^5*d^2
 + 3*a^2*b*c^4*d^3 - a^3*c^3*d^4)*g^4)
```

<u>**giac**</u> **[A]**   time = 13.81, size = 746, normalized size = 1.74

$$\frac{1}{54}\left(18\left(\frac{3\,(bx+a)B^2b^2n^2}{\left(b^2c^2g^4 - 2\,abcdg^4 + a^2d^2g^4\right)(dx+c)} - \frac{3\,(bx+a)^2B^2bdn^2}{\left(b^2c^2g^4 - 2\,abcdg^4 + a^2d^2g^4\right)(dx+c)^2} + \frac{(bx+a)^3}{\left(b^2c^2g^4 - 2\,abcdg^4\right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x, algorithm="gi
ac")
```

```
[Out] 1/54*(18*(3*(b*x + a)*B^2*b^2*n^2/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g
^4)*(d*x + c)) - 3*(b*x + a)^2*B^2*b*d*n^2/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 +
a^2*d^2*g^4)*(d*x + c)^2) + (b*x + a)^3*B^2*d^2*n^2/((b^2*c^2*g^4 - 2*a*b*c
*d*g^4 + a^2*d^2*g^4)*(d*x + c)^3))*log((b*x + a)/(d*x + c))^2 - 6*(2*(B^2*
d^2*n^2 - 3*A*B*d^2*n - 3*B^2*d^2*n)*(b*x + a)^3/((b^2*c^2*g^4 - 2*a*b*c*d*
g^4 + a^2*d^2*g^4)*(d*x + c)^3) - 9*(B^2*b*d*n^2 - 2*A*B*b*d*n - 2*B^2*b*d*
n)*(b*x + a)^2/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(d*x + c)^2) +
18*(B^2*b^2*n^2 - A*B*b^2*n - B^2*b^2*n)*(b*x + a)/((b^2*c^2*g^4 - 2*a*b*c*
d*g^4 + a^2*d^2*g^4)*(d*x + c)))*log((b*x + a)/(d*x + c)) + 2*(2*B^2*d^2*n^
2 - 6*A*B*d^2*n - 6*B^2*d^2*n + 9*A^2*d^2 + 18*A*B*d^2 + 9*B^2*d^2)*(b*x +
a)^3/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(d*x + c)^3) - 27*(B^2*b*
d*n^2 - 2*A*B*b*d*n - 2*B^2*b*d*n + 2*A^2*b*d + 4*A*B*b*d + 2*B^2*b*d)*(b*x
 + a)^2/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(d*x + c)^2) + 54*(2*B
^2*b^2*n^2 - 2*A*B*b^2*n - 2*B^2*b^2*n + A^2*b^2 + 2*A*B*b^2 + B^2*b^2)*(b*
x + a)/((b^2*c^2*g^4 - 2*a*b*c*d*g^4 + a^2*d^2*g^4)*(d*x + c)))*(b*c/(b*c -
 a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(dgx+cg\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^4,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^4,x)
```

maxima [B] time = 1.29, size = 1435, normalized size = 3.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x, algorithm="ma
xima")
```

```
[Out] 1/9*A*B*n*((6*b^2*d^2*x^2 + 11*b^2*c^2 - 7*a*b*c*d + 2*a^2*d^2 + 3*(5*b^2*c
*d - a*b*d^2)*x)/((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*g^4*x^3 + 3*(b^2*c^
3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*g^4*x^2 + 3*(b^2*c^4*d^2 - 2*a*b*c^3*d^3
 + a^2*c^2*d^4)*g^4*x + (b^2*c^5*d - 2*a*b*c^4*d^2 + a^2*c^3*d^3)*g^4) + 6*
b^3*log(b*x + a)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4)*g
^4) - 6*b^3*log(d*x + c)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^
3*d^4)*g^4)) + 1/54*(6*n*((6*b^2*d^2*x^2 + 11*b^2*c^2 - 7*a*b*c*d + 2*a^2*d
^2 + 3*(5*b^2*c*d - a*b*d^2)*x)/((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*g^4*
x^3 + 3*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*g^4*x^2 + 3*(b^2*c^4*d^2
- 2*a*b*c^3*d^3 + a^2*c^2*d^4)*g^4*x + (b^2*c^5*d - 2*a*b*c^4*d^2 + a^2*c^3
*d^3)*g^4) + 6*b^3*log(b*x + a)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d
^3 - a^3*d^4)*g^4) - 6*b^3*log(d*x + c)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a
^2*b*c*d^3 - a^3*d^4)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (85*b^
3*c^3 - 108*a*b^2*c^2*d + 27*a^2*b*c*d^2 - 4*a^3*d^3 + 66*(b^3*c*d^2 - a*b^
2*d^3)*x^2 + 18*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*l
og(b*x + a)^2 + 18*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3
)*log(d*x + c)^2 + 3*(49*b^3*c^2*d - 54*a*b^2*c*d^2 + 5*a^2*b*d^3)*x + 66*(
b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(b*x + a) - 6*(
11*b^3*d^3*x^3 + 33*b^3*c*d^2*x^2 + 33*b^3*c^2*d*x + 11*b^3*c^3 + 6*(b^3*d^
3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(b*x + a))*log(d*x +
c))*n^2/(b^3*c^6*d*g^4 - 3*a*b^2*c^5*d^2*g^4 + 3*a^2*b*c^4*d^3*g^4 - a^3*c^
3*d^4*g^4 + (b^3*c^3*d^4*g^4 - 3*a*b^2*c^2*d^5*g^4 + 3*a^2*b*c*d^6*g^4 - a^
```

```
3*d^7*g^4)*x^3 + 3*(b^3*c^4*d^3*g^4 - 3*a*b^2*c^3*d^4*g^4 + 3*a^2*b*c^2*d^5
*g^4 - a^3*c*d^6*g^4)*x^2 + 3*(b^3*c^5*d^2*g^4 - 3*a*b^2*c^4*d^3*g^4 + 3*a^
2*b*c^3*d^4*g^4 - a^3*c^2*d^5*g^4)*x))*B^2 - 1/3*B^2*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n)^2/(d^4*g^4*x^3 + 3*c*d^3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d
*g^4) - 2/3*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*g^4*x^3 + 3*c*d
^3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4) - 1/3*A^2/(d^4*g^4*x^3 + 3*c*d^3*
g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4)
```

mupad [B] time = 7.16, size = 1040, normalized size = 2.42

$$-\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)^2\left(\frac{B^2}{3\,d\,\left(c^3\,g^4+3\,c^2\,d\,g^4\,x+3\,c\,d^2\,g^4\,x^2+d^3\,g^4\,x^3\right)}+\frac{B^2\,b^3}{3\,d\,g^4\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*g + d*g*x)^4,x)
```

```
[Out] - log(e*((a + b*x)/(c + d*x))^n)^2*(B^2/(3*d*(c^3*g^4 + d^3*g^4*x^3 + 3*c*d
^2*g^4*x^2 + 3*c^2*d*g^4*x)) + (B^2*b^3)/(3*d*g^4*(a^3*d^3 - b^3*c^3 + 3*a*
b^2*c^2*d - 3*a^2*b*c*d^2))) - ((18*A^2*a^2*d^2 + 18*A^2*b^2*c^2 + 4*B^2*a^
2*d^2*n^2 + 85*B^2*b^2*c^2*n^2 - 36*A^2*a*b*c*d - 12*A*B*a^2*d^2*n - 66*A*B
*b^2*c^2*n - 23*B^2*a*b*c*d*n^2 + 42*A*B*a*b*c*d*n)/(6*(a*d - b*c)) - (x*(5
*B^2*a*b*d^2*n^2 - 49*B^2*b^2*c*d*n^2 - 6*A*B*a*b*d^2*n + 30*A*B*b^2*c*d*n)
)/(2*(a*d - b*c)) + (b*x^2*(11*B^2*b*d^2*n^2 - 6*A*B*b*d^2*n))/(a*d - b*c))
/(x*(27*a*c^2*d^3*g^4 - 27*b*c^3*d^2*g^4) - x^2*(27*b*c^2*d^3*g^4 - 27*a*c*
d^4*g^4) + x^3*(9*a*d^5*g^4 - 9*b*c*d^4*g^4) + 9*a*c^3*d^2*g^4 - 9*b*c^4*d*
g^4) - log(e*((a + b*x)/(c + d*x))^n)*((2*A*B)/(3*c^3*d*g^4 + 3*d^4*g^4*x^3
 + 9*c^2*d^2*g^4*x + 9*c*d^3*g^4*x^2) + (2*B^2*b^3*(x*(d*((d*g^4*n*(a*d - b
*c)*(a*d - 3*b*c))/(2*b^2) - (c*d*g^4*n*(a*d - b*c))/b) - (2*c*d^2*g^4*n*(a
*d - b*c))/b + (d^2*g^4*n*(a*d - b*c)*(a*d - 3*b*c))/b^2) + c*((d*g^4*n*(a*
d - b*c)*(a*d - 3*b*c))/(2*b^2) - (c*d*g^4*n*(a*d - b*c))/b) - (d*g^4*n*(a*
d - b*c)*(a^2*d^2 + 3*b^2*c^2 - 3*a*b*c*d))/b^3 - (3*d^3*g^4*n*x^2*(a*d - b
*c))/b))/(3*d*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)*(3*c^
3*d*g^4 + 3*d^4*g^4*x^3 + 9*c^2*d^2*g^4*x + 9*c*d^3*g^4*x^2))) - (B*b^3*n*a
tan((B*b^3*n*(6*A - 11*B*n)*((a^3*d^4*g^4 + b^3*c^3*d*g^4 - a^2*b*c*d^3*g^4
 - a*b^2*c^2*d^2*g^4)/(a^2*d^3*g^4 + b^2*c^2*d*g^4 - 2*a*b*c*d^2*g^4) + 2*b
*d*x)*(a^2*d^3*g^4 + b^2*c^2*d*g^4 - 2*a*b*c*d^2*g^4)*1i)/(d*g^4*(11*B^2*b^
3*n^2 - 6*A*B*b^3*n)*(a*d - b*c)^3))*(6*A - 11*B*n)*2i)/(9*d*g^4*(a*d - b*c
)^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^2}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx+\int \frac{B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx+\int \frac{2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}{c^4+4c^3dx+6c^2d^2x^2+4cd^3x^3+d^4x^4}\,dx}{g^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**4,x)
```

```
[Out] (Integral(A**2/(c**4 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4
*x**4), x) + Integral(B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2/(c**4
 + 4*c**3*d*x + 6*c**2*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x) + Integra
l(2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)/(c**4 + 4*c**3*d*x + 6*c**2
*d**2*x**2 + 4*c*d**3*x**3 + d**4*x**4), x))/g**4
```

3.46 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^5}\,dx$

Optimal. Leaf size=536

$$\frac{b^4Bn\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2dg^5(bc-ad)^4}-\frac{2b^3Bn(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^5(c+dx)(bc-ad)^4}+\frac{3b^2Bdn(a+bx)^2\left(B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{2g^5(c+dx)^2(bc-ad}$$

```
[Out] -1/32*B^2*d^3*n^2*(b*x+a)^4/(-a*d+b*c)^4/g^5/(d*x+c)^4+2/9*b*B^2*d^2*n^2*(b
*x+a)^3/(-a*d+b*c)^4/g^5/(d*x+c)^3-3/4*b^2*B^2*d*n^2*(b*x+a)^2/(-a*d+b*c)^4
/g^5/(d*x+c)^2+2*b^3*B^2*n^2*(b*x+a)/(-a*d+b*c)^4/g^5/(d*x+c)+1/8*B*d^3*n*(
b*x+a)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(d*x+c)^4-2/3*b*B
*d^2*n*(b*x+a)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(d*x+c)^3
+3/2*b^2*B*d*n*(b*x+a)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5/(
d*x+c)^2-2*b^3*B*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*d+b*c)^4/g^5
/(d*x+c)-1/4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/d/g^5/(d*x+c)^4+1/2*b^4*B*n*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((b*x+a)/(d*x+c))/d/(-a*d+b*c)^4/g^5-1/4*
b^4*B^2*n^2*ln((b*x+a)/(d*x+c))^2/d/(-a*d+b*c)^4/g^5
```

Rubi **[C]** time = 1.30, antiderivative size = 826, normalized size of antiderivative = 1.54, number of steps used = 36, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$-\frac{B^2n^2\log^2(a+bx)b^4}{4d(bc-ad)^4g^5}-\frac{B^2n^2\log^2(c+dx)b^4}{4d(bc-ad)^4g^5}-\frac{25B^2n^2\log(a+bx)b^4}{24d(bc-ad)^4g^5}+\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^4}{2d(bc-ad)^4g^5}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^5,x]
```

```
[Out] -(B^2*n^2)/(32*d*g^5*(c + d*x)^4) - (7*b*B^2*n^2)/(72*d*(b*c - a*d)*g^5*(c
+ d*x)^3) - (13*b^2*B^2*n^2)/(48*d*(b*c - a*d)^2*g^5*(c + d*x)^2) - (25*b^3
*B^2*n^2)/(24*d*(b*c - a*d)^3*g^5*(c + d*x)) - (25*b^4*B^2*n^2*Log[a + b*x]
)/(24*d*(b*c - a*d)^4*g^5) - (b^4*B^2*n^2*Log[a + b*x]^2)/(4*d*(b*c - a*d)^
4*g^5) + (B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(8*d*g^5*(c + d*x)^4)
 + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d*(b*c - a*d)*g^5*(c +
 d*x)^3) + (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d*(b*c - a*d
)^2*g^5*(c + d*x)^2) + (b^3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
d*(b*c - a*d)^3*g^5*(c + d*x)) + (b^4*B*n*Log[a + b*x]*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/(2*d*(b*c - a*d)^4*g^5) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2/(4*d*g^5*(c + d*x)^4) + (25*b^4*B^2*n^2*Log[c + d*x])/(24*d*(b*
c - a*d)^4*g^5) + (b^4*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(2*d*(b*c - a*d)^4*g^5) - (b^4*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[c + d*x])/(2*d*(b*c - a*d)^4*g^5) - (b^4*B^2*n^2*Log[c + d*x]^2)/(4*
d*(b*c - a*d)^4*g^5) + (b^4*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(2*d*(b*c - a*d)^4*g^5) + (b^4*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(2*d*(b*c - a*d)^4*g^5) + (b^4*B^2*n^2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(2*d*(b*c - a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^5}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4}+\frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^4(a+bx)(c+dx)^5}\,dx}{2dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4}+\frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^5}\,dx}{2dg^5}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4}+\frac{(B(bc-ad)n)\int \left(\frac{b^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^5(a+bx)}-\frac{d\left(A+B\log\left(e\right.\right.}{(bc-ad)(c}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4}-\frac{(Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^5}\,dx}{2g^5}-\frac{\left(b^4Bn\right)\int \frac{A+B\log\left(e\left(\frac{a}{c}\right.\right.}{c+dx}}{2(bc-ad)^4g}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8dg^5(c+dx)^4}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d(bc-ad)g^5(c+dx)^3}+\frac{b^2Bn\left(A+B\log\right.}{4d(bc-ad)^2g}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8dg^5(c+dx)^4}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d(bc-ad)g^5(c+dx)^3}+\frac{b^2Bn\left(A+B\log\right.}{4d(bc-ad)^2g}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8dg^5(c+dx)^4}+\frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d(bc-ad)g^5(c+dx)^3}+\frac{b^2Bn\left(A+B\log\right.}{4d(bc-ad)^2g}$$

$$= -\frac{B^2n^2}{32dg^5(c+dx)^4}-\frac{7bB^2n^2}{72d(bc-ad)g^5(c+dx)^3}-\frac{13b^2B^2n^2}{48d(bc-ad)^2g^5(c+dx)^2}-\frac{}{24d}$$

$$= -\frac{B^2n^2}{32dg^5(c+dx)^4}-\frac{7bB^2n^2}{72d(bc-ad)g^5(c+dx)^3}-\frac{13b^2B^2n^2}{48d(bc-ad)^2g^5(c+dx)^2}-\frac{}{24d}$$

$$= -\frac{B^2n^2}{32dg^5(c+dx)^4}-\frac{7bB^2n^2}{72d(bc-ad)g^5(c+dx)^3}-\frac{13b^2B^2n^2}{48d(bc-ad)^2g^5(c+dx)^2}-\frac{}{24d}$$

Mathematica [C] time = 0.93, size = 776, normalized size = 1.45

$$\frac{Bn\left(144b^4(c+dx)^4\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-144b^4(c+dx)^4\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+144b^3(c+dx)^3(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+72b^2(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^5,x]
```

```
[Out] (-72*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(36*(b*c - a*d)^4*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*b*(b*c - a*d)^3*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]) + 72*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 144*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]) + 144*b^4*(c + d*x)^4*Log[a + b*x]*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) - 144*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c + d*x] - 144*b^3*B*n*(c + d*x)^3*(b*c - a*d + b*(c + d*x)
*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 36*b^2*B*n*(c + d*x)^2*((b*c -
a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2
*(c + d*x)^2*Log[c + d*x]) - 8*b*B*n*(c + d*x)*(2*(b*c - a*d)^3 + 3*b*(b*c
- a*d)^2*(c + d*x) + 6*b^2*(b*c - a*d)*(c + d*x)^2 + 6*b^3*(c + d*x)^3*Log[
a + b*x] - 6*b^3*(c + d*x)^3*Log[c + d*x]) - 3*B*n*(3*(b*c - a*d)^4 + 4*b*(
b*c - a*d)^3*(c + d*x) + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 12*b^3*(b*c - a*
d)*(c + d*x)^3 + 12*b^4*(c + d*x)^4*Log[a + b*x] - 12*b^4*(c + d*x)^4*Log[c
 + d*x]) - 72*b^4*B*n*(c + d*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 72*b
^4*B*n*(c + d*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Lo
g[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^4)/(288
*d*g^5*(c + d*x)^4)
```

fricas [B] time = 1.16, size = 1768, normalized size = 3.30

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/288*(72*A^2*b^4*c^4 - 288*A^2*a*b^3*c^3*d + 432*A^2*a^2*b^2*c^2*d^2 - 28
8*A^2*a^3*b*c*d^3 + 72*A^2*a^4*d^4 + 12*(25*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)
*n^2 - 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 + (415*B^2*b^4*c^4 - 576*B
^2*a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 64*B^2*a^3*b*c*d^3 + 9*B^2*a^4*d
^4)*n^2 + 6*((163*B^2*b^4*c^2*d^2 - 176*B^2*a*b^3*c*d^3 + 13*B^2*a^2*b^2*d^
4)*n^2 - 12*(7*A*B*b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*n)*x^
2 + 72*(B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3
*b*c*d^3 + B^2*a^4*d^4)*log(e)^2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*b^4*c*d^
3*n^2*x^3 + 6*B^2*b^4*c^2*d^2*n^2*x^2 + 4*B^2*b^4*c^3*d*n^2*x + (4*B^2*a*b^
3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n^2)*log
((b*x + a)/(d*x + c))^2 - 12*(25*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 36*A*B*
a^2*b^2*c^2*d^2 - 16*A*B*a^3*b*c*d^3 + 3*A*B*a^4*d^4)*n + 4*((271*B^2*b^4*c
^3*d - 324*B^2*a*b^3*c^2*d^2 + 60*B^2*a^2*b^2*c*d^3 - 7*B^2*a^3*b*d^4)*n^2
- 12*(13*A*B*b^4*c^3*d - 18*A*B*a*b^3*c^2*d^2 + 6*A*B*a^2*b^2*c*d^3 - A*B*a
^3*b*d^4)*n)*x + 12*(12*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 72*A*B*a^2*b^2*c
^2*d^2 - 48*A*B*a^3*b*c*d^3 + 12*A*B*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*a*b^
3*d^4)*n*x^3 - 6*(7*B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*
n*x^2 - 4*(13*B^2*b^4*c^3*d - 18*B^2*a*b^3*c^2*d^2 + 6*B^2*a^2*b^2*c*d^3 -
B^2*a^3*b*d^4)*n*x - (25*B^2*b^4*c^4 - 48*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*
c^2*d^2 - 16*B^2*a^3*b*c*d^3 + 3*B^2*a^4*d^4)*n - 12*(B^2*b^4*d^4*n*x^4 + 4
*B^2*b^4*c*d^3*n*x^3 + 6*B^2*b^4*c^2*d^2*n*x^2 + 4*B^2*b^4*c^3*d*n*x + (4*B
^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n
)*log((b*x + a)/(d*x + c)))*log(e) + 12*((25*B^2*b^4*d^4*n^2 - 12*A*B*b^4*d
^4*n)*x^4 - 4*(12*A*B*b^4*c*d^3*n - (22*B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*n^
2)*x^3 + (48*B^2*a*b^3*c^3*d - 36*B^2*a^2*b^2*c^2*d^2 + 16*B^2*a^3*b*c*d^3
- 3*B^2*a^4*d^4)*n^2 - 6*(12*A*B*b^4*c^2*d^2*n - (18*B^2*b^4*c^2*d^2 + 8*B^
2*a*b^3*c*d^3 - B^2*a^2*b^2*d^4)*n^2)*x^2 - 12*(4*A*B*a*b^3*c^3*d - 6*A*B*a
^2*b^2*c^2*d^2 + 4*A*B*a^3*b*c*d^3 - A*B*a^4*d^4)*n - 4*(12*A*B*b^4*c^3*d*n
 - (12*B^2*b^4*c^3*d + 18*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2*b^2*c*d^3 + B^2*a^3
*b*d^4)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^4*c^4*d^5 - 4*a*b^3*c^3*d^6 +
```

```
 6*a^2*b^2*c^2*d^7 - 4*a^3*b*c*d^8 + a^4*d^9)*g^5*x^4 + 4*(b^4*c^5*d^4 - 4*
a*b^3*c^4*d^5 + 6*a^2*b^2*c^3*d^6 - 4*a^3*b*c^2*d^7 + a^4*c*d^8)*g^5*x^3 +
6*(b^4*c^6*d^3 - 4*a*b^3*c^5*d^4 + 6*a^2*b^2*c^4*d^5 - 4*a^3*b*c^3*d^6 + a^
4*c^2*d^7)*g^5*x^2 + 4*(b^4*c^7*d^2 - 4*a*b^3*c^6*d^3 + 6*a^2*b^2*c^5*d^4 -
 4*a^3*b*c^4*d^5 + a^4*c^3*d^6)*g^5*x + (b^4*c^8*d - 4*a*b^3*c^7*d^2 + 6*a^
2*b^2*c^6*d^3 - 4*a^3*b*c^5*d^4 + a^4*c^4*d^5)*g^5)
```

giac [**B**] time = 19.41, size = 1225, normalized size = 2.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x, algorithm="gi
ac")
```

```
[Out] 1/288*(72*(4*(b*x + a)*B^2*b^3*n^2/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^
2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)) - 6*(b*x + a)^2*B^2*b^2*d*n^2/((b^3
*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^2
) + 4*(b*x + a)^3*B^2*b*d^2*n^2/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b
*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^3) - (b*x + a)^4*B^2*d^3*n^2/((b^3*c^3*
g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^4))*lo
g((b*x + a)/(d*x + c))^2 + 12*(3*(B^2*d^3*n^2 - 4*A*B*d^3*n - 4*B^2*d^3*n)*
(b*x + a)^4/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3
*g^5)*(d*x + c)^4) - 16*(B^2*b*d^2*n^2 - 3*A*B*b*d^2*n - 3*B^2*b*d^2*n)*(b*
x + a)^3/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^
5)*(d*x + c)^3) + 36*(B^2*b^2*d*n^2 - 2*A*B*b^2*d*n - 2*B^2*b^2*d*n)*(b*x +
 a)^2/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*
(d*x + c)^2) - 48*(B^2*b^3*n^2 - A*B*b^3*n - B^2*b^3*n)*(b*x + a)/((b^3*c^3
*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)))*log
((b*x + a)/(d*x + c)) - 9*(B^2*d^3*n^2 - 4*A*B*d^3*n - 4*B^2*d^3*n + 8*A^2*
d^3 + 16*A*B*d^3 + 8*B^2*d^3)*(b*x + a)^4/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5
 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^4) + 32*(2*B^2*b*d^2*n^2 - 6*
A*B*b*d^2*n - 6*B^2*b*d^2*n + 9*A^2*b*d^2 + 18*A*B*b*d^2 + 9*B^2*b*d^2)*(b*
x + a)^3/((b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^
5)*(d*x + c)^3) - 216*(B^2*b^2*d*n^2 - 2*A*B*b^2*d*n - 2*B^2*b^2*d*n + 2*A^
2*b^2*d + 4*A*B*b^2*d + 2*B^2*b^2*d)*(b*x + a)^2/((b^3*c^3*g^5 - 3*a*b^2*c^
2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c)^2) + 288*(2*B^2*b^3*n^
2 - 2*A*B*b^3*n - 2*B^2*b^3*n + A^2*b^3 + 2*A*B*b^3 + B^2*b^3)*(b*x + a)/((
b^3*c^3*g^5 - 3*a*b^2*c^2*d*g^5 + 3*a^2*b*c*d^2*g^5 - a^3*d^3*g^5)*(d*x + c
)))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [**F**] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\left(B \ln\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(dgx+cg\right)^{5}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^5,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(d*g*x+c*g)^5,x)
```

maxima [**B**] time = 2.11, size = 2138, normalized size = 3.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x, algorithm="ma
xima")
```

```
[Out] 1/24*A*B*n*((12*b^3*d^3*x^3 + 25*b^3*c^3 - 23*a*b^2*c^2*d + 13*a^2*b*c*d^2
- 3*a^3*d^3 + 6*(7*b^3*c*d^2 - a*b^2*d^3)*x^2 + 4*(13*b^3*c^2*d - 5*a*b^2*c
*d^2 + a^2*b*d^3)*x)/((b^3*c^3*d^5 - 3*a*b^2*c^2*d^6 + 3*a^2*b*c*d^7 - a^3*
d^8)*g^5*x^4 + 4*(b^3*c^4*d^4 - 3*a*b^2*c^3*d^5 + 3*a^2*b*c^2*d^6 - a^3*c*d
^7)*g^5*x^3 + 6*(b^3*c^5*d^3 - 3*a*b^2*c^4*d^4 + 3*a^2*b*c^3*d^5 - a^3*c^2*
d^6)*g^5*x^2 + 4*(b^3*c^6*d^2 - 3*a*b^2*c^5*d^3 + 3*a^2*b*c^4*d^4 - a^3*c^3
*d^5)*g^5*x + (b^3*c^7*d - 3*a*b^2*c^6*d^2 + 3*a^2*b*c^5*d^3 - a^3*c^4*d^4)
*g^5) + 12*b^4*log(b*x + a)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d
^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5) - 12*b^4*log(d*x + c)/((b^4*c^4*d - 4*a*
b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5)) + 1/288*(1
2*n*((12*b^3*d^3*x^3 + 25*b^3*c^3 - 23*a*b^2*c^2*d + 13*a^2*b*c*d^2 - 3*a^3
*d^3 + 6*(7*b^3*c*d^2 - a*b^2*d^3)*x^2 + 4*(13*b^3*c^2*d - 5*a*b^2*c*d^2 +
a^2*b*d^3)*x)/((b^3*c^3*d^5 - 3*a*b^2*c^2*d^6 + 3*a^2*b*c*d^7 - a^3*d^8)*g^
5*x^4 + 4*(b^3*c^4*d^4 - 3*a*b^2*c^3*d^5 + 3*a^2*b*c^2*d^6 - a^3*c*d^7)*g^5
*x^3 + 6*(b^3*c^5*d^3 - 3*a*b^2*c^4*d^4 + 3*a^2*b*c^3*d^5 - a^3*c^2*d^6)*g^
5*x^2 + 4*(b^3*c^6*d^2 - 3*a*b^2*c^5*d^3 + 3*a^2*b*c^4*d^4 - a^3*c^3*d^5)*g
^5*x + (b^3*c^7*d - 3*a*b^2*c^6*d^2 + 3*a^2*b*c^5*d^3 - a^3*c^4*d^4)*g^5) +
 12*b^4*log(b*x + a)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*
a^3*b*c*d^4 + a^4*d^5)*g^5) - 12*b^4*log(d*x + c)/((b^4*c^4*d - 4*a*b^3*c^3
*d^2 + 6*a^2*b^2*c^2*d^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5))*log(e*(b*x/(d*x +
 c) + a/(d*x + c))^n) - (415*b^4*c^4 - 576*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^
2 - 64*a^3*b*c*d^3 + 9*a^4*d^4 + 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(163*b
^4*c^2*d^2 - 176*a*b^3*c*d^3 + 13*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*b^
4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(b*x + a)^2 +
 72*(b^4*d^4*x^4 + 4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^
4*c^4)*log(d*x + c)^2 + 4*(271*b^4*c^3*d - 324*a*b^3*c^2*d^2 + 60*a^2*b^2*c
*d^3 - 7*a^3*b*d^4)*x + 300*(b^4*d^4*x^4 + 4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*
x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(b*x + a) - 12*(25*b^4*d^4*x^4 + 100*b^4*
c*d^3*x^3 + 150*b^4*c^2*d^2*x^2 + 100*b^4*c^3*d*x + 25*b^4*c^4 + 12*(b^4*d^
4*x^4 + 4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(
b*x + a))*log(d*x + c))*n^2/(b^4*c^8*d*g^5 - 4*a*b^3*c^7*d^2*g^5 + 6*a^2*b^
2*c^6*d^3*g^5 - 4*a^3*b*c^5*d^4*g^5 + a^4*c^4*d^5*g^5 + (b^4*c^4*d^5*g^5 -
4*a*b^3*c^3*d^6*g^5 + 6*a^2*b^2*c^2*d^7*g^5 - 4*a^3*b*c*d^8*g^5 + a^4*d^9*g
^5)*x^4 + 4*(b^4*c^5*d^4*g^5 - 4*a*b^3*c^4*d^5*g^5 + 6*a^2*b^2*c^3*d^6*g^5
- 4*a^3*b*c^2*d^7*g^5 + a^4*c*d^8*g^5)*x^3 + 6*(b^4*c^6*d^3*g^5 - 4*a*b^3*c
^5*d^4*g^5 + 6*a^2*b^2*c^4*d^5*g^5 - 4*a^3*b*c^3*d^6*g^5 + a^4*c^2*d^7*g^5)
*x^2 + 4*(b^4*c^7*d^2*g^5 - 4*a*b^3*c^6*d^3*g^5 + 6*a^2*b^2*c^5*d^4*g^5 - 4
*a^3*b*c^4*d^5*g^5 + a^4*c^3*d^6*g^5)*x))*B^2 - 1/4*B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 +
4*c^3*d^2*g^5*x + c^4*d*g^5) - 1/2*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n)/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c
^4*d*g^5) - 1/4*A^2/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*
c^3*d^2*g^5*x + c^4*d*g^5)
```

mupad [B] time = 9.08, size = 1765, normalized size = 3.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(c*g + d*g*x)^5,x)
```

```
[Out] (B*b^4*n*atan((B*b^4*n*(12*A - 25*B*n)*(24*a^4*d^5*g^5 - 24*b^4*c^4*d*g^5 -
 48*a^3*b*c*d^4*g^5 + 48*a*b^3*c^3*d^2*g^5)*1i)/(24*d*g^5*(25*B^2*b^4*n^2 -
 12*A*B*b^4*n)*(a*d - b*c)^4) + (B*b^5*n*x*(12*A - 25*B*n)*(a^3*d^4*g^5 - b
^3*c^3*d*g^5 - 3*a^2*b*c*d^3*g^5 + 3*a*b^2*c^2*d^2*g^5)*2i)/(g^5*(25*B^2*b^
4*n^2 - 12*A*B*b^4*n)*(a*d - b*c)^4))*(12*A - 25*B*n)*1i)/(12*d*g^5*(a*d -
b*c)^4) - ((72*A^2*a^3*d^3 - 72*A^2*b^3*c^3 + 9*B^2*a^3*d^3*n^2 - 415*B^2*b
^3*c^3*n^2 + 216*A^2*a*b^2*c^2*d - 216*A^2*a^2*b*c*d^2 - 36*A*B*a^3*d^3*n +
 300*A*B*b^3*c^3*n + 161*B^2*a*b^2*c^2*d*n^2 - 55*B^2*a^2*b*c*d^2*n^2 - 276
*A*B*a*b^2*c^2*d*n + 156*A*B*a^2*b*c*d^2*n)/(12*(a*d - b*c)) + (x^2*(13*B^2
```

```
*a*b^2*d^3*n^2 - 163*B^2*b^3*c*d^2*n^2 - 12*A*B*a*b^2*d^3*n + 84*A*B*b^3*c*
d^2*n))/(2*(a*d - b*c)) - (x*(7*B^2*a^2*b*d^3*n^2 + 271*B^2*b^3*c^2*d*n^2 -
 53*B^2*a*b^2*c*d^2*n^2 - 12*A*B*a^2*b*d^3*n - 156*A*B*b^3*c^2*d*n + 60*A*B
*a*b^2*c*d^2*n))/(3*(a*d - b*c)) - (b*x^3*(25*B^2*b^2*d^3*n^2 - 12*A*B*b^2*
d^3*n))/(a*d - b*c))/(x*(96*a^2*c^3*d^4*g^5 + 96*b^2*c^5*d^2*g^5 - 192*a*b*
c^4*d^3*g^5) + x^3*(96*a^2*c*d^6*g^5 + 96*b^2*c^3*d^4*g^5 - 192*a*b*c^2*d^5
*g^5) + x^4*(24*a^2*d^7*g^5 + 24*b^2*c^2*d^5*g^5 - 48*a*b*c*d^6*g^5) + x^2*
(144*a^2*c^2*d^5*g^5 + 144*b^2*c^4*d^3*g^5 - 288*a*b*c^3*d^4*g^5) + 24*b^2*
c^6*d*g^5 + 24*a^2*c^4*d^3*g^5 - 48*a*b*c^5*d^2*g^5) - log(e*((a + b*x)/(c
+ d*x))^n)^2*(B^2/(4*d*(c^4*g^5 + d^4*g^5*x^4 + 4*c*d^3*g^5*x^3 + 6*c^2*d^2
*g^5*x^2 + 4*c^3*d*g^5*x)) - (B^2*b^4)/(4*d*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*
b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - log(e*((a + b*x)/(c + d*x)
)^n)*((A*B)/(2*c^4*d*g^5 + 2*d^5*g^5*x^4 + 8*c^3*d^2*g^5*x + 8*c*d^4*g^5*x^
3 + 12*c^2*d^3*g^5*x^2) - (B^2*b^4*(x*(d*(c*((d*g^5*n*(a*d - b*c)*(a*d - 4*
b*c))/(6*b^2) - (c*d*g^5*n*(a*d - b*c))/(2*b)) - (d*g^5*n*(a*d - b*c)*(a^2*
d^2 + 6*b^2*c^2 - 4*a*b*c*d))/(6*b^3)) + c*(d*((d*g^5*n*(a*d - b*c)*(a*d -
4*b*c))/(6*b^2) - (c*d*g^5*n*(a*d - b*c))/(2*b)) - (c*d^2*g^5*n*(a*d - b*c)
)/b + (d^2*g^5*n*(a*d - b*c)*(a*d - 4*b*c))/(3*b^2)) - (d^2*g^5*n*(a*d - b*
c)*(a^2*d^2 + 6*b^2*c^2 - 4*a*b*c*d))/(2*b^3)) + c*(c*((d*g^5*n*(a*d - b*c)
*(a*d - 4*b*c))/(6*b^2) - (c*d*g^5*n*(a*d - b*c))/(2*b)) - (d*g^5*n*(a*d -
b*c)*(a^2*d^2 + 6*b^2*c^2 - 4*a*b*c*d))/(6*b^3)) + x^2*(d*(d*((d*g^5*n*(a*d
 - b*c)*(a*d - 4*b*c))/(6*b^2) - (c*d*g^5*n*(a*d - b*c))/(2*b)) - (c*d^2*g^
5*n*(a*d - b*c))/b + (d^2*g^5*n*(a*d - b*c)*(a*d - 4*b*c))/(3*b^2)) - (3*c*
d^3*g^5*n*(a*d - b*c))/(2*b) + (d^3*g^5*n*(a*d - b*c)*(a*d - 4*b*c))/(2*b^2
)) - (2*d^4*g^5*n*x^3*(a*d - b*c))/b + (d*g^5*n*(a*d - b*c)*(a^3*d^3 - 4*b^
3*c^3 + 6*a*b^2*c^2*d - 4*a^2*b*c*d^2))/(2*b^4)))/(2*d*g^5*(2*c^4*d*g^5 + 2
*d^5*g^5*x^4 + 8*c^3*d^2*g^5*x + 8*c*d^4*g^5*x^3 + 12*c^2*d^3*g^5*x^2)*(a^4
*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)))
```

sympy [**F(-1)**]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**5,x)

[Out] Timed out
```

3.47 $\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=38

$$\mathrm{Int}\left(\frac{(cg+dgx)^2}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable((d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] c^2*g^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + 2*c*d*
g^2*Defer[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x] + d^2*g^2*Defer
[Int][x^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{c^2g^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{2cdg^2x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{d^2g^2x^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right) d\\ &= \left(c^2g^2\right)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(2cdg^2\right)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(d\end{aligned}$$

Mathematica [A] time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

fricas [A] time = 0.87, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{d^2g^2x^2+2\,cdg^2x+c^2g^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] integral((d^2*g^2*x^2 + 2*c*d*g^2*x + c^2*g^2)/(B*log(e*((b*x + a)/(d*x + c
))^n) + A), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] Timed out
```

maple [**A**] time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{\left(dgx+cg\right)^{2}}{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(dgx+cg\right)^{2}}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] integrate((d*g*x + c*g)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,g+d\,g\,x\right)}^2}{A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] int((c*g + d*g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$g^{2}\left(\int \frac{c^{2}}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx+\int \frac{d^{2}x^{2}}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx+\int \frac{2cdx}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,d\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] g**2*(Integral(c**2/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x) + I
ntegral(d**2*x**2/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x) + Int
egral(2*c*d*x/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x))
```

3.48 $\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=36

$$\mathrm{Int}\left(\frac{cg+dgx}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] c*g*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + d*g*Defer[
Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{cg}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= (cg)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(dg)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

fricas [A] time = 1.32, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{dgx+cg}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] integral((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{dgx+cg}{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{dgx+cg}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] integrate((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{c\,g+d\,g\,x}{A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] int((c*g + d*g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int \frac{c}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\, dx+\int \frac{dx}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] g*(Integral(c/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x) + Integra
l(d*x/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x))
```

3.49 $\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=38

$$\mathrm{Int}\left(\frac{1}{(cg+dgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
[Out] Defer[Int][1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
[Out] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

fricas [A] time = 0.80, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{Adgx+Acg+\left(Bdgx+Bcg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] integral(1/(A*d*g*x + A*c*g + (B*d*g*x + B*c*g)*log(e*((b*x + a)/(d*x + c))
^n)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] Timed out
```

maple [A] time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((d*g*x + c*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(c\,g+d\,g\,x\right)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((c*g + d*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((c*g + d*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Ac+Adx+Bc\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)+Bdx\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral(1/(A*c + A*d*x + B*c*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B*d
*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x)/g
```

3.50 $\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=96

$$\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\operatorname{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(c+dx)(bc-ad)}$$

```
[Out] (b*x+a)*Ei((A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B/(-a*d+b*c)/exp(A/B/n)/g^2
/n/((e*((b*x+a)/(d*x+c))^n)^(1/n))/(d*x+c)
```

Rubi [F] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.12, size = 96, normalized size = 1.00

$$\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\operatorname{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] ((a + b*x)*ExpIntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)])/(B*
(b*c - a*d)*E^(A/(B*n))*g^2*n*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

fricas [A] time = 0.90, size = 62, normalized size = 0.65

$$\frac{e^{\left(-\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(bx+a)e^{\left(\frac{B\log(e)+A}{Bn}\right)}}{dx+c}\right)}{(Bbc-Bad)g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

```
[Out] e^(-(B*log(e) + A)/(B*n))*log_integral((b*x + a)*e^((B*log(e) + A)/(B*n))/(
d*x + c))/((B*b*c - B*a*d)*g^2*n)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)^{2} \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)^{2}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((d*g*x + c*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(c\,g+d\,g\,x\right)}^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((c*g + d*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((c*g + d*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Ac^{2} + 2Acdx + Ad^{2}x^{2} + Bc^{2}\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)} + 2Bcdx\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)} + Bd^{2}x^{2}\log{\left(e\left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}}\, dx}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral(1/(A*c**2 + 2*A*c*d*x + A*d**2*x**2 + B*c**2*log(e*(a/(c + d*x) +
b*x/(c + d*x))**n) + 2*B*c*d*x*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B*
d**2*x**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x)/g**2
```

3.51 $\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=199

$$\frac{b(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^3n(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\text{Ei}\left(\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bg^3n(c+dx)^2(bc-ad)^2}$$

```
[Out] b*(b*x+a)*Ei((A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B/(-a*d+b*c)^2/exp(A/B/n)
/g^3/n/((e*((b*x+a)/(d*x+c))^n)^(1/n))/(d*x+c)-d*(b*x+a)^2*Ei(2*(A+B*ln(e*(
(b*x+a)/(d*x+c))^n))/B/n)/B/(-a*d+b*c)^2/exp(2*A/B/n)/g^3/n/((e*((b*x+a)/(d
*x+c))^n)^(2/n))/(d*x+c)^2
```

Rubi [F] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.29, size = 174, normalized size = 0.87

$$\frac{(a+bx)e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\left(be^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)-d(a+bx)\text{Ei}\left(\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)\right)}{Bg^3n(c+dx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] ((a + b*x)*(b*E^(A/(B*n))*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpI
ntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)] - d*(a + b*x)*ExpIn
tegralEi[(2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n)]))/(B*(b*c - a*d)
^2*E^((2*A)/(B*n))*g^3*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

fricas [A] time = 0.90, size = 147, normalized size = 0.74

$$\frac{\left(be^{\left(\frac{B\log(e)+A}{Bn}\right)}\,\text{log\_integral}\left(\frac{(bx+a)e^{\left(\frac{B\log(e)+A}{Bn}\right)}}{dx+c}\right)-d\,\text{log\_integral}\left(\frac{\left(b^2x^2+2\,abx+a^2\right)e^{\left(\frac{2\,(B\log(e)+A)}{Bn}\right)}}{d^2x^2+2\,cdx+c^2}\right)\right)e^{\left(-\frac{2\,(B\log(e)+A)}{Bn}\right)}}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)g^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

```
[Out] (b*e^((B*log(e) + A)/(B*n))*log_integral((b*x + a)*e^((B*log(e) + A)/(B*n))
/(d*x + c)) - d*log_integral((b^2*x^2 + 2*a*b*x + a^2)*e^(2*(B*log(e) + A)/
(B*n))/(d^2*x^2 + 2*c*d*x + c^2)))*e^(-2*(B*log(e) + A)/(B*n))/((B*b^2*c^2
- 2*B*a*b*c*d + B*a^2*d^2)*g^3*n)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

```
[Out] Timed out
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)^{3} \left(B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(d*g*x+c*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)^{3} \left(B \log \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((d*g*x + c*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(c\,g+d\,g\,x\right)}^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((c*g + d*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((c*g + d*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

3.52 $\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=38

$$\mathrm{Int}\left(\frac{(cg+dgx)^2}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] c^2*g^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + 2*c*d*
g^2*Defer[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x] + d^2*g^2*Def
er[Int][x^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{c^2g^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{2cdg^2x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{d^2g^2x^2}{\left(A+B\log\left(e\left(\frac{a+b}{c+a}\right.\right.\right.}\right.\\ &= \left(c^2g^2\right)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+\left(2cdg^2\right)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,d\end{aligned}$$

Mathematica [A] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

fricas [A] time = 1.03, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{d^2g^2x^2+2\,cdg^2x+c^2g^2}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral((d^2*g^2*x^2 + 2*c*d*g^2*x + c^2*g^2)/(B^2*log(e*((b*x + a)/(d*x +
 c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*x + c))^n) + A^2), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(dgx + cg\right)^2}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*g*x + c*g)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

maple [**A**] time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{\left(dgx + cg\right)^2}{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bd^3g^2x^4 + ac^3g^2 + \left(3\,bcd^2g^2 + ad^3g^2\right)x^3 + 3\left(bc^2dg^2 + acd^2g^2\right)x^2 + \left(bc^3g^2 + 3\,ac^2dg^2\right)x}{(bcn - adn)B^2\log\left((bx+a)^n\right) - (bcn - adn)B^2\log\left((dx+c)^n\right) + (bcn - adn)AB + \left(bcn\log(e) - adn\log(e)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] -(b*d^3*g^2*x^4 + a*c^3*g^2 + (3*b*c*d^2*g^2 + a*d^3*g^2)*x^3 + 3*(b*c^2*d*
g^2 + a*c*d^2*g^2)*x^2 + (b*c^3*g^2 + 3*a*c^2*d*g^2)*x)/((b*c*n - a*d*n)*B^
2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)
*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrate((4*b*d^3*g^2*x^3 + b*
c^3*g^2 + 3*a*c^2*d*g^2 + 3*(3*b*c*d^2*g^2 + a*d^3*g^2)*x^2 + 6*(b*c^2*d*g^
2 + a*c*d^2*g^2)*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)
*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))
*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,g+d\,g\,x\right)}^2}{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*g + d*g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$g^{2}\left(\int\frac{c^{2}}{A^{2}+2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)+B^{2}\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)^{2}}\,dx+\int\frac{d^{2}x^{2}}{A^{2}+2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] g**2*(Integral(c**2/(A**2 + 2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) +
 B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2), x) + Integral(d**2*x**2/
(A**2 + 2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B**2*log(e*(a/(c +
d*x) + b*x/(c + d*x))**n)**2), x) + Integral(2*c*d*x/(A**2 + 2*A*B*log(e*(a
/(c + d*x) + b*x/(c + d*x))**n) + B**2*log(e*(a/(c + d*x) + b*x/(c + d*x))*
*n)**2), x))
```

3.53 $\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=36

$$\text{Int}\left(\frac{cg+dgx}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] c*g*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + d*g*Defer[
Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{cg}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right)dx\\ &= (cg)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+(dg)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

fricas [A] time = 0.90, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{dgx+cg}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral((d*g*x + c*g)/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*
((b*x + a)/(d*x + c))^n) + A^2), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{dgx + cg}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

maple [**A**] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{dgx + cg}{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bd^2gx^3 + ac^2g + \left(2\,bcdg + ad^2g\right)x^2 + \left(bc^2g + 2\,acdg\right)x}{(bcn - adn)B^2\log\left((bx+a)^n\right) - (bcn - adn)B^2\log\left((dx+c)^n\right) + (bcn - adn)AB + \left(bcn\log(e) - adn\log(e)\right)B^2} +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] -(b*d^2*g*x^3 + a*c^2*g + (2*b*c*d*g + a*d^2*g)*x^2 + (b*c^2*g + 2*a*c*d*g)
*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x +
c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrat
e((3*b*d^2*g*x^2 + b*c^2*g + 2*a*c*d*g + 2*(2*b*c*d*g + a*d^2*g)*x)/((b*c*n
 - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*
c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{c\,g + d\,g\,x}{\left(A + B\,\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*g + d*g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((c*g + d*g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int\frac{c}{A^2+2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)+B^2\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)^2}\,dx+\int\frac{dx}{A^2+2AB\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] g*(Integral(c/(A**2 + 2*A*B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B**2*
log(e*(a/(c + d*x) + b*x/(c + d*x))**n)**2), x) + Integral(d*x/(A**2 + 2*A*
B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n) + B**2*log(e*(a/(c + d*x) + b*x/(
c + d*x))**n)**2), x))
```

3.54 $\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=38

$$\text{Int}\left(\frac{1}{(cg+dgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A]   time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
[Out] Defer[Int][1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A]   time = 0.56, size = 0, normalized size = 0.00

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
[Out] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

fricas [A]   time = 0.90, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2dgx+A^2cg+\left(B^2dgx+B^2cg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\left(ABdgx+ABcg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*d*g*x + A^2*c*g + (B^2*d*g*x + B^2*c*g)*log(e*((b*x + a)/(d
*x + c))^n)^2 + 2*(A*B*d*g*x + A*B*c*g)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((d*g*x + c*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

maple [A] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(d*g*x+c*g)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{1}{\left(bcgn-adgn\right)B^{2}\log\left(\left(bx+a\right)^{n}\right)-\left(bcgn-adgn\right)B^{2}\log\left(\left(dx+c\right)^{n}\right)+\left(bcgn-adgn\right)AB+(bcgn\log(e)-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] b*integrate(1/((b*c*g*n - a*d*g*n)*B^2*log((b*x + a)^n) - (b*c*g*n - a*d*g*
n)*B^2*log((d*x + c)^n) + (b*c*g*n - a*d*g*n)*A*B + (b*c*g*n*log(e) - a*d*g
*n*log(e))*B^2), x) - (b*x + a)/((b*c*g*n - a*d*g*n)*B^2*log((b*x + a)^n) -
 (b*c*g*n - a*d*g*n)*B^2*log((d*x + c)^n) + (b*c*g*n - a*d*g*n)*A*B + (b*c*
g*n*log(e) - a*d*g*n*log(e))*B^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(c\,g+d\,g\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((c*g + d*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
```

```
[Out] int(1/((c*g + d*g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.55 $\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=154

$$\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\operatorname{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^2n^2(c+dx)(bc-ad)}-\frac{a+bx}{Bg^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

```
[Out] (b*x+a)*Ei((A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B^2/(-a*d+b*c)/exp(A/B/n)/g
^2/n^2/((e*((b*x+a)/(d*x+c))^n)^(1/n))/(d*x+c)+(-b*x-a)/B/(-a*d+b*c)/g^2/n/
(d*x+c)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))
```

Rubi [**F**] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [**A**] time = 0.17, size = 180, normalized size = 1.17

$$-\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\left(Bne^{\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}-\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\operatorname{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)\right)}{B^2g^2n^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] -(((a + b*x)*(B*E^(A/(B*n))*n*(e*((a + b*x)/(c + d*x))^n)^n^(-1) - ExpInteg
ralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])))/(B^2*(b*c - a*d)*E^(A/(B*n))*g^2*n^2*(e*((a + b*x)/(c + d
*x))^n)^n^(-1)*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))
```

fricas [**A**] time = 0.81, size = 291, normalized size = 1.89

$$-\frac{\Bigg((Bbnx+Ban)e^{\left(\frac{B\log(e)+A}{Bn}\right)}-\Big(Adx+Ac+(Bdx+Bc)\log(e)+(Bdnx+Bcn)\log\left(\frac{bx+a}{dx+c}\right)\Big)\mathrm{lo}}{\left(AB^2bcd-AB^2ad^2\right)g^2n^2x+\left(AB^2bc^2-AB^2acd\right)g^2n^2+\Big(\left(B^3bcd-B^3ad^2\right)g^2n^2x+\left(B^3bc^2-B^3acd\right)g^2n^2\Big)\log(e)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

```
[Out] -((B*b*n*x + B*a*n)*e^((B*log(e) + A)/(B*n)) - (A*d*x + A*c + (B*d*x + B*c)
*log(e) + (B*d*n*x + B*c*n)*log((b*x + a)/(d*x + c)))*log_integral((b*x + a
)*e^((B*log(e) + A)/(B*n))/(d*x + c)))*e^(-(B*log(e) + A)/(B*n))/((A*B^2*b*
c*d - A*B^2*a*d^2)*g^2*n^2*x + (A*B^2*b*c^2 - A*B^2*a*c*d)*g^2*n^2 + ((B^3*
b*c*d - B^3*a*d^2)*g^2*n^2*x + (B^3*b*c^2 - B^3*a*c*d)*g^2*n^2)*log(e) + ((
B^3*b*c*d - B^3*a*d^2)*g^2*n^3*x + (B^3*b*c^2 - B^3*a*c*d)*g^2*n^3)*log((b*
x + a)/(d*x + c)))
```

giac [A] time = 1.16, size = 140, normalized size = 0.91

$$-\left(\frac{bc}{(bc-ad)^2}-\frac{ad}{(bc-ad)^2}\right)\left(\frac{bx+a}{\left(B^2g^2n^2\log\left(\frac{bx+a}{dx+c}\right)+ABg^2n+B^2g^2n\right)(dx+c)}-\frac{\operatorname{Ei}\left(\frac{A}{Bn}+\frac{1}{n}+\log\left(\frac{bx+a}{dx+c}\right)\right)e^{\left(-\frac{A}{Bn}-\right.}}{B^2g^2n^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

```
[Out] -(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)*((b*x + a)/((B^2*g^2*n^2*log((b*x
+ a)/(d*x + c)) + A*B*g^2*n + B^2*g^2*n)*(d*x + c)) - Ei(A/(B*n) + 1/n + lo
g((b*x + a)/(d*x + c)))*e^(-A/(B*n) - 1/n)/(B^2*g^2*n^2))
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx+cg\right)^{2}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(d*g*x+c*g)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(bc^2g^2n-acdg^2n\right)AB+\left(bc^2g^2n\log(e)-acdg^2n\log(e)\right)B^2+\left(\left(bcdg^2n-ad^2g^2n\right)AB+\left(bcdg^2n\log(e)-ad^2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

```
[Out] -(b*x + a)/((b*c^2*g^2*n - a*c*d*g^2*n)*A*B + (b*c^2*g^2*n*log(e) - a*c*d*g
^2*n*log(e))*B^2 + ((b*c*d*g^2*n - a*d^2*g^2*n)*A*B + (b*c*d*g^2*n*log(e) -
 a*d^2*g^2*n*log(e))*B^2)*x + ((b*c*d*g^2*n - a*d^2*g^2*n)*B^2*x + (b*c^2*g
^2*n - a*c*d*g^2*n)*B^2)*log((b*x + a)^n) - ((b*c*d*g^2*n - a*d^2*g^2*n)*B^
2*x + (b*c^2*g^2*n - a*c*d*g^2*n)*B^2)*log((d*x + c)^n)) - integrate(-1/(B^
2*c^2*g^2*n*log(e) + A*B*c^2*g^2*n + (B^2*d^2*g^2*n*log(e) + A*B*d^2*g^2*n)
*x^2 + 2*(B^2*c*d*g^2*n*log(e) + A*B*c*d*g^2*n)*x + (B^2*d^2*g^2*n*x^2 + 2*
B^2*c*d*g^2*n*x + B^2*c^2*g^2*n)*log((b*x + a)^n) - (B^2*d^2*g^2*n*x^2 + 2*
B^2*c*d*g^2*n*x + B^2*c^2*g^2*n)*log((d*x + c)^n)), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(c g + d g x\right)^{2} \left(A + B \ln\left(e \left(\frac{a+b x}{c+d x}\right)^{n}\right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((c*g + d*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
[Out] int(1/((c*g + d*g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
[Out] Timed out
```

3.56 $\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=256

$$-\frac{2d(a+bx)^2e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\text{Ei}\left(\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2g^3n^2(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^3n^2(c+dx)(bc-ad)^2}-$$

```
[Out] b*(b*x+a)*Ei((A+B*ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B^2/(-a*d+b*c)^2/exp(A/B/
n)/g^3/n^2/((e*((b*x+a)/(d*x+c))^n)^(1/n))/(d*x+c)-2*d*(b*x+a)^2*Ei(2*(A+B*
ln(e*((b*x+a)/(d*x+c))^n))/B/n)/B^2/(-a*d+b*c)^2/exp(2*A/B/n)/g^3/n^2/((e*(
(b*x+a)/(d*x+c))^n)^(2/n))/(d*x+c)^2+(-b*x-a)/B/(-a*d+b*c)/g^3/n/(d*x+c)^2/
(A+B*ln(e*((b*x+a)/(d*x+c))^n))
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.54, size = 288, normalized size = 1.12

$$\frac{(a+bx)e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\left(be^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)-2d(a+\right.}{B^2g^3n^2(c+dx)^2(bc-ad)^2\left(B\log\left(e\left(\right.\right.\right.}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] ((a + b*x)*(-(B*(b*c - a*d)*E^((2*A)/(B*n))*n*(e*((a + b*x)/(c + d*x))^n)^(
2/n)) + b*E^(A/(B*n))*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpInteg
ralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]) - 2*d*(a + b*x)*ExpIntegralEi[(2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(B*n)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(B^2*(b*c - a
```

```
*d)^2*E^((2*A)/(B*n))*g^3*n^2*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

fricas [B] time = 0.90, size = 770, normalized size = 3.01

$$\frac{\left(\left(Abd^2x^2 + 2\,Abcdx + Abc^2 + \left(Bbd^2x^2 + 2\,Bbcdx + Bbc^2\right)\log(e) + \left(Bbd^2nx^2 + 2\,Bbcdnx\right.\right.\right.}{\left(AB^2b^2c^2d^2 - 2\,AB^2abcd^3 + AB^2a^2d^4\right)g^3n^2x^2 + 2\left(AB^2b^2c^3d - 2\,AB^2abc^2d^2 + AB^2a^2cd^3\right)g^3n^2x + \left(AB^2b^2c^4 - 2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

```
[Out] ((A*b*d^2*x^2 + 2*A*b*c*d*x + A*b*c^2 + (B*b*d^2*x^2 + 2*B*b*c*d*x + B*b*c^
2)*log(e) + (B*b*d^2*n*x^2 + 2*B*b*c*d*n*x + B*b*c^2*n)*log((b*x + a)/(d*x
+ c)))*e^((B*log(e) + A)/(B*n))*log_integral((b*x + a)*e^((B*log(e) + A)/(B
*n))/(d*x + c)) - ((B*b^2*c - B*a*b*d)*n*x + (B*a*b*c - B*a^2*d)*n)*e^(2*(B
*log(e) + A)/(B*n)) - 2*(A*d^3*x^2 + 2*A*c*d^2*x + A*c^2*d + (B*d^3*x^2 + 2
*B*c*d^2*x + B*c^2*d)*log(e) + (B*d^3*n*x^2 + 2*B*c*d^2*n*x + B*c^2*d*n)*lo
g((b*x + a)/(d*x + c)))*log_integral((b^2*x^2 + 2*a*b*x + a^2)*e^(2*(B*log(
e) + A)/(B*n))/(d^2*x^2 + 2*c*d*x + c^2)))*e^(-2*(B*log(e) + A)/(B*n))/((A*
B^2*b^2*c^2*d^2 - 2*A*B^2*a*b*c*d^3 + A*B^2*a^2*d^4)*g^3*n^2*x^2 + 2*(A*B^2
*b^2*c^3*d - 2*A*B^2*a*b*c^2*d^2 + A*B^2*a^2*c*d^3)*g^3*n^2*x + (A*B^2*b^2*
c^4 - 2*A*B^2*a*b*c^3*d + A*B^2*a^2*c^2*d^2)*g^3*n^2 + ((B^3*b^2*c^2*d^2 -
2*B^3*a*b*c*d^3 + B^3*a^2*d^4)*g^3*n^2*x^2 + 2*(B^3*b^2*c^3*d - 2*B^3*a*b*c
^2*d^2 + B^3*a^2*c*d^3)*g^3*n^2*x + (B^3*b^2*c^4 - 2*B^3*a*b*c^3*d + B^3*a^
2*c^2*d^2)*g^3*n^2)*log(e) + ((B^3*b^2*c^2*d^2 - 2*B^3*a*b*c*d^3 + B^3*a^2*
d^4)*g^3*n^3*x^2 + 2*(B^3*b^2*c^3*d - 2*B^3*a*b*c^2*d^2 + B^3*a^2*c*d^3)*g^
3*n^3*x + (B^3*b^2*c^4 - 2*B^3*a*b*c^3*d + B^3*a^2*c^2*d^2)*g^3*n^3)*log((b
*x + a)/(d*x + c)))
```

giac [A] time = 2.11, size = 312, normalized size = 1.22

$$\left(\frac{b\mathrm{Ei}\left(\frac{A}{Bn} + \frac{1}{n} + \log\left(\frac{bx+a}{dx+c}\right)\right)e^{\left(-\frac{A}{Bn} - \frac{1}{n}\right)}}{B^2bcg^3n^2 - B^2adg^3n^2} - \frac{2\,d\mathrm{Ei}\left(\frac{2\,A}{Bn} + \frac{2}{n} + 2\,\log\left(\frac{bx+a}{dx+c}\right)\right)e^{\left(-\frac{2\,A}{Bn} - \frac{2}{n}\right)}}{B^2bcg^3n^2 - B^2adg^3n^2} - \frac{}{B^2bcg^3n^2\log\left(\frac{bx+a}{dx+c}\right) - B^2adg^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

```
[Out] (b*Ei(A/(B*n) + 1/n + log((b*x + a)/(d*x + c)))*e^(-A/(B*n) - 1/n)/(B^2*b*c
*g^3*n^2 - B^2*a*d*g^3*n^2) - 2*d*Ei(2*A/(B*n) + 2/n + 2*log((b*x + a)/(d*x
 + c)))*e^(-2*A/(B*n) - 2/n)/(B^2*b*c*g^3*n^2 - B^2*a*d*g^3*n^2) - ((b*x +
a)*b/(d*x + c) - (b*x + a)^2*d/(d*x + c)^2)/(B^2*b*c*g^3*n^2*log((b*x + a)/
(d*x + c)) - B^2*a*d*g^3*n^2*log((b*x + a)/(d*x + c)) + A*B*b*c*g^3*n + B^2
*b*c*g^3*n - A*B*a*d*g^3*n - B^2*a*d*g^3*n))*(b*c/(b*c - a*d)^2 - a*d/(b*c
- a*d)^2)
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(dgx + cg\right)^3 \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(d*g*x+c*g)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(bc^3g^3n - ac^2dg^3n\right)AB + \left(bc^3g^3n\log(e) - ac^2dg^3n\log(e)\right)B^2 + \left(\left(bcd^2g^3n - ad^3g^3n\right)AB + \left(bcd^2g^3n\log(e) -\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

```
[Out] -(b*x + a)/((b*c^3*g^3*n - a*c^2*d*g^3*n)*A*B + (b*c^3*g^3*n*log(e) - a*c^2
*d*g^3*n*log(e))*B^2 + ((b*c*d^2*g^3*n - a*d^3*g^3*n)*A*B + (b*c*d^2*g^3*n*
log(e) - a*d^3*g^3*n*log(e))*B^2)*x^2 + 2*((b*c^2*d*g^3*n - a*c*d^2*g^3*n)*
A*B + (b*c^2*d*g^3*n*log(e) - a*c*d^2*g^3*n*log(e))*B^2)*x + ((b*c*d^2*g^3*
n - a*d^3*g^3*n)*B^2*x^2 + 2*(b*c^2*d*g^3*n - a*c*d^2*g^3*n)*B^2*x + (b*c^3
*g^3*n - a*c^2*d*g^3*n)*B^2)*log((b*x + a)^n) - ((b*c*d^2*g^3*n - a*d^3*g^3
*n)*B^2*x^2 + 2*(b*c^2*d*g^3*n - a*c*d^2*g^3*n)*B^2*x + (b*c^3*g^3*n - a*c^
2*d*g^3*n)*B^2)*log((d*x + c)^n)) - integrate((b*d*x - b*c + 2*a*d)/(((b*c*
d^3*g^3*n - a*d^4*g^3*n)*A*B + (b*c*d^3*g^3*n*log(e) - a*d^4*g^3*n*log(e))*
B^2)*x^3 + (b*c^4*g^3*n - a*c^3*d*g^3*n)*A*B + (b*c^4*g^3*n*log(e) - a*c^3*
d*g^3*n*log(e))*B^2 + 3*((b*c^2*d^2*g^3*n - a*c*d^3*g^3*n)*A*B + (b*c^2*d^2
*g^3*n*log(e) - a*c*d^3*g^3*n*log(e))*B^2)*x^2 + 3*((b*c^3*d*g^3*n - a*c^2*
d^2*g^3*n)*A*B + (b*c^3*d*g^3*n*log(e) - a*c^2*d^2*g^3*n*log(e))*B^2)*x + (
(b*c*d^3*g^3*n - a*d^4*g^3*n)*B^2*x^3 + 3*(b*c^2*d^2*g^3*n - a*c*d^3*g^3*n)
*B^2*x^2 + 3*(b*c^3*d*g^3*n - a*c^2*d^2*g^3*n)*B^2*x + (b*c^4*g^3*n - a*c^3
*d*g^3*n)*B^2)*log((b*x + a)^n) - ((b*c*d^3*g^3*n - a*d^4*g^3*n)*B^2*x^3 +
3*(b*c^2*d^2*g^3*n - a*c*d^3*g^3*n)*B^2*x^2 + 3*(b*c^3*d*g^3*n - a*c^2*d^2*
g^3*n)*B^2*x + (b*c^4*g^3*n - a*c^3*d*g^3*n)*B^2)*log((d*x + c)^n)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(c\,g+d\,g\,x\right)}^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((c*g + d*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
```

```
[Out] int(1/((c*g + d*g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.57 $\int (f+gx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=364

$$-\frac{Bg^2nx^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+Bgnx(bc-ad)\,(a^3d^3g^3-a^2bd^2g^2(5$$

```
[Out] 1/5*B*(-a*d+b*c)*g*(a^3*d^3*g^3-a^2*b*d^2*g^2*(-c*g+5*d*f)+a*b^2*d*g*(c^2*g
^2-5*c*d*f*g+10*d^2*f^2)-b^3*(-c^3*g^3+5*c^2*d*f*g^2-10*c*d^2*f^2*g+10*d^3*
f^3))*n*x/b^4/d^4-1/10*B*(-a*d+b*c)*g^2*(a^2*d^2*g^2-a*b*d*g*(-c*g+5*d*f)+b
^2*(c^2*g^2-5*c*d*f*g+10*d^2*f^2))*n*x^2/b^3/d^3-1/15*B*(-a*d+b*c)*g^3*(-a*
d*g-b*c*g+5*b*d*f)*n*x^3/b^2/d^2-1/20*B*(-a*d+b*c)*g^4*n*x^4/b/d-1/5*B*(-a*
g+b*f)^5*n*ln(b*x+a)/b^5/g+1/5*(g*x+f)^5*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/g+
1/5*B*(-c*g+d*f)^5*n*ln(d*x+c)/d^5/g
```

Rubi [A] time = 0.60, antiderivative size = 348, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 72}

$$-\frac{Bg^2nx^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+Bgnx\,(-10a^2b^2d^4f^2g+5a^3bd^4fg^2$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*g*(10*a*b^3*d^4*f^3 - 10*a^2*b^2*d^4*f^2*g + 5*a^3*b*d^4*f*g^2 - a^4*d^4
*g^3 - b^4*c*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*d*f*g^2 - c^3*g^3))*n*x)/
(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*d*g*(5*d*f - c*g) + b^2
*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*n*x^2)/(10*b^3*d^3) - (B*(b*c - a*d)*g
^3*(5*b*d*f - b*c*g - a*d*g)*n*x^3)/(15*b^2*d^2) - (B*(b*c - a*d)*g^4*n*x^4
)/(20*b*d) - (B*(b*f - a*g)^5*n*Log[a + b*x])/(5*b^5*g) + ((f + g*x)^5*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*g) + (B*(d*f - c*g)^5*n*Log[c + d*x]
)/(5*d^5*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^4 \left(A+B\log \left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx = \frac{(f+gx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5g} - \frac{(Bn)\int \frac{(bc-ad)(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5g} - \frac{(B(bc-ad)n)\int \frac{(f+gx)^5}{(a+bx)(c+dx)}\,}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5g} - \frac{(B(bc-ad)n)\int \left(\frac{g^2\left(-a^3d^3g^3+\right.}{}\right.}{}$$

$$= \frac{B(bc-ad)g\left(a^3d^3g^3-a^2bd^2g^2(5df-cg)+ab^2dg\left(10d^2f^2-5cd\right.\right.}{5b^4d^4}$$

Mathematica [**A**] time = 0.63, size = 285, normalized size = 0.78

$$\frac{Bg^2nx(ad-bc)\left(-12a^3d^3g^3+6a^2bd^2g^2(-2cg+10df+dgx)-2ab^2dg\left(6c^2g^2-3cdg(10f+gx)+d^2\left(60f^2+15fgx+2g^2x^2\right)\right)+b^3\left(-12c^3g^3+6c^2dg^2(10f+gx)-\right.\right.}{12b^4d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((B*(-(b*c) + a*d)*g^2*n*x*(-12*a^3*d^3*g^3 + 6*a^2*b*d^2*g^2*(10*d*f - 2*c
*g + d*g*x) - 2*a*b^2*d*g*(6*c^2*g^2 - 3*c*d*g*(10*f + g*x) + d^2*(60*f^2 +
 15*f*g*x + 2*g^2*x^2)) + b^3*(-12*c^3*g^3 + 6*c^2*d*g^2*(10*f + g*x) - 2*c
*d^2*g*(60*f^2 + 15*f*g*x + 2*g^2*x^2) + d^3*(120*f^3 + 60*f^2*g*x + 20*f*g
^2*x^2 + 3*g^3*x^3))))/(12*b^4*d^4) - (B*(b*f - a*g)^5*n*Log[a + b*x])/b^5
+ (f + g*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*(d*f - c*g)^5*n*L
og[c + d*x])/d^5)/(5*g)
```

fricas [**B**] time = 2.39, size = 736, normalized size = 2.02

$$12\,Ab^5d^5g^4x^5+3\left(20\,Ab^5d^5fg^3-\left(Bb^5cd^4-Bab^4d^5\right)g^4n\right)x^4+4\left(30\,Ab^5d^5f^2g^2-\left(5\left(Bb^5cd^4-Bab^4d^5\right)fg^3-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 3*(20*A*b^5*d^5*f*g^3 - (B*b^5*c*d^4 - B*a*b^4
*d^5)*g^4*n)*x^4 + 4*(30*A*b^5*d^5*f^2*g^2 - (5*(B*b^5*c*d^4 - B*a*b^4*d^5)
*f*g^3 - (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*g^4)*n)*x^3 + 6*(20*A*b^5*d^5*f^3*
g - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*f^2*g^2 - 5*(B*b^5*c^2*d^3 - B*a^2*b^3*
d^5)*f*g^3 + (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g^4)*n)*x^2 + 12*(5*B*a*b^4*d^
5*f^4 - 10*B*a^2*b^3*d^5*f^3*g + 10*B*a^3*b^2*d^5*f^2*g^2 - 5*B*a^4*b*d^5*f
*g^3 + B*a^5*d^5*g^4)*n*log(b*x + a) - 12*(5*B*b^5*c*d^4*f^4 - 10*B*b^5*c^2
*d^3*f^3*g + 10*B*b^5*c^3*d^2*f^2*g^2 - 5*B*b^5*c^4*d*f*g^3 + B*b^5*c^5*g^4
)*n*log(d*x + c) + 12*(5*A*b^5*d^5*f^4 - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*f^
3*g - 10*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f^2*g^2 + 5*(B*b^5*c^3*d^2 - B*a^3
*b^2*d^5)*f*g^3 - (B*b^5*c^4*d - B*a^4*b*d^5)*g^4)*n)*x + 12*(B*b^5*d^5*g^4
*x^5 + 5*B*b^5*d^5*f*g^3*x^4 + 10*B*b^5*d^5*f^2*g^2*x^3 + 10*B*b^5*d^5*f^3*
g*x^2 + 5*B*b^5*d^5*f^4*x)*log(e) + 12*(B*b^5*d^5*g^4*n*x^5 + 5*B*b^5*d^5*f
*g^3*n*x^4 + 10*B*b^5*d^5*f^2*g^2*n*x^3 + 10*B*b^5*d^5*f^3*g*n*x^2 + 5*B*b^
5*d^5*f^4*n*x)*log((b*x + a)/(d*x + c)))/(b^5*d^5)
```

giac [B] time = 15.16, size = 11806, normalized size = 32.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/60*(12*(5*B*b^6*c^2*d^4*f^4*n - 10*B*a*b^5*c*d^5*f^4*n - 20*(b*x + a)*B*b
^5*c^2*d^5*f^4*n/(d*x + c) + 5*B*a^2*b^4*d^6*f^4*n + 40*(b*x + a)*B*a*b^4*c
*d^6*f^4*n/(d*x + c) + 30*(b*x + a)^2*B*b^4*c^2*d^6*f^4*n/(d*x + c)^2 - 20*
(b*x + a)*B*a^2*b^3*d^7*f^4*n/(d*x + c) - 60*(b*x + a)^2*B*a*b^3*c*d^7*f^4*
n/(d*x + c)^2 - 20*(b*x + a)^3*B*b^3*c^2*d^7*f^4*n/(d*x + c)^3 + 30*(b*x +
a)^2*B*a^2*b^2*d^8*f^4*n/(d*x + c)^2 + 40*(b*x + a)^3*B*a*b^2*c*d^8*f^4*n/(
d*x + c)^3 + 5*(b*x + a)^4*B*b^2*c^2*d^8*f^4*n/(d*x + c)^4 - 20*(b*x + a)^3
*B*a^2*b*d^9*f^4*n/(d*x + c)^3 - 10*(b*x + a)^4*B*a*b*c*d^9*f^4*n/(d*x + c)
^4 + 5*(b*x + a)^4*B*a^2*d^10*f^4*n/(d*x + c)^4 - 10*B*b^6*c^3*d^3*f^3*g*n
+ 10*B*a*b^5*c^2*d^4*f^3*g*n + 50*(b*x + a)*B*b^5*c^3*d^4*f^3*g*n/(d*x + c)
 + 10*B*a^2*b^4*c*d^5*f^3*g*n - 70*(b*x + a)*B*a*b^4*c^2*d^5*f^3*g*n/(d*x +
 c) - 90*(b*x + a)^2*B*b^4*c^3*d^5*f^3*g*n/(d*x + c)^2 - 10*B*a^3*b^3*d^6*f
^3*g*n - 10*(b*x + a)*B*a^2*b^3*c*d^6*f^3*g*n/(d*x + c) + 150*(b*x + a)^2*B
*a*b^3*c^2*d^6*f^3*g*n/(d*x + c)^2 + 70*(b*x + a)^3*B*b^3*c^3*d^6*f^3*g*n/(
d*x + c)^3 + 30*(b*x + a)*B*a^3*b^2*d^7*f^3*g*n/(d*x + c) - 30*(b*x + a)^2*
B*a^2*b^2*c*d^7*f^3*g*n/(d*x + c)^2 - 130*(b*x + a)^3*B*a*b^2*c^2*d^7*f^3*g
*n/(d*x + c)^3 - 20*(b*x + a)^4*B*b^2*c^3*d^7*f^3*g*n/(d*x + c)^4 - 30*(b*x
 + a)^2*B*a^3*b*d^8*f^3*g*n/(d*x + c)^2 + 50*(b*x + a)^3*B*a^2*b*c*d^8*f^3*
g*n/(d*x + c)^3 + 40*(b*x + a)^4*B*a*b*c^2*d^8*f^3*g*n/(d*x + c)^4 + 10*(b*
x + a)^3*B*a^3*d^9*f^3*g*n/(d*x + c)^3 - 20*(b*x + a)^4*B*a^2*c*d^9*f^3*g*n
/(d*x + c)^4 + 10*B*b^6*c^4*d^2*f^2*g^2*n - 10*B*a*b^5*c^3*d^3*f^2*g^2*n -
50*(b*x + a)*B*b^5*c^4*d^3*f^2*g^2*n/(d*x + c) + 50*(b*x + a)*B*a*b^4*c^3*d
^4*f^2*g^2*n/(d*x + c) + 100*(b*x + a)^2*B*b^4*c^4*d^4*f^2*g^2*n/(d*x + c)^
2 - 10*B*a^3*b^3*c*d^5*f^2*g^2*n + 30*(b*x + a)*B*a^2*b^3*c^2*d^5*f^2*g^2*n
/(d*x + c) - 130*(b*x + a)^2*B*a*b^3*c^3*d^5*f^2*g^2*n/(d*x + c)^2 - 90*(b*
x + a)^3*B*b^3*c^4*d^5*f^2*g^2*n/(d*x + c)^3 + 10*B*a^4*b^2*d^6*f^2*g^2*n -
 10*(b*x + a)*B*a^3*b^2*c*d^6*f^2*g^2*n/(d*x + c) - 30*(b*x + a)^2*B*a^2*b^
2*c^2*d^6*f^2*g^2*n/(d*x + c)^2 + 150*(b*x + a)^3*B*a*b^2*c^3*d^6*f^2*g^2*n
/(d*x + c)^3 + 30*(b*x + a)^4*B*b^2*c^4*d^6*f^2*g^2*n/(d*x + c)^4 - 20*(b*x
 + a)*B*a^4*b*d^7*f^2*g^2*n/(d*x + c) + 50*(b*x + a)^2*B*a^3*b*c*d^7*f^2*g^
2*n/(d*x + c)^2 - 30*(b*x + a)^3*B*a^2*b*c^2*d^7*f^2*g^2*n/(d*x + c)^3 - 60
*(b*x + a)^4*B*a*b*c^3*d^7*f^2*g^2*n/(d*x + c)^4 + 10*(b*x + a)^2*B*a^4*d^8
*f^2*g^2*n/(d*x + c)^2 - 30*(b*x + a)^3*B*a^3*c*d^8*f^2*g^2*n/(d*x + c)^3 +
 30*(b*x + a)^4*B*a^2*c^2*d^8*f^2*g^2*n/(d*x + c)^4 - 5*B*b^6*c^5*d*f*g^3*n
 + 5*B*a*b^5*c^4*d^2*f*g^3*n + 25*(b*x + a)*B*b^5*c^5*d^2*f*g^3*n/(d*x + c)
 - 25*(b*x + a)*B*a*b^4*c^4*d^3*f*g^3*n/(d*x + c) - 50*(b*x + a)^2*B*b^4*c^
5*d^3*f*g^3*n/(d*x + c)^2 + 50*(b*x + a)^2*B*a*b^3*c^4*d^4*f*g^3*n/(d*x + c
)^2 + 50*(b*x + a)^3*B*b^3*c^5*d^4*f*g^3*n/(d*x + c)^3 + 5*B*a^4*b^2*c*d^5*
f*g^3*n - 20*(b*x + a)*B*a^3*b^2*c^2*d^5*f*g^3*n/(d*x + c) + 30*(b*x + a)^2
*B*a^2*b^2*c^3*d^5*f*g^3*n/(d*x + c)^2 - 70*(b*x + a)^3*B*a*b^2*c^4*d^5*f*g
^3*n/(d*x + c)^3 - 20*(b*x + a)^4*B*b^2*c^5*d^5*f*g^3*n/(d*x + c)^4 - 5*B*a
^5*b*d^6*f*g^3*n + 15*(b*x + a)*B*a^4*b*c*d^6*f*g^3*n/(d*x + c) - 10*(b*x +
 a)^2*B*a^3*b*c^2*d^6*f*g^3*n/(d*x + c)^2 - 10*(b*x + a)^3*B*a^2*b*c^3*d^6*
f*g^3*n/(d*x + c)^3 + 40*(b*x + a)^4*B*a*b*c^4*d^6*f*g^3*n/(d*x + c)^4 + 5*
(b*x + a)*B*a^5*d^7*f*g^3*n/(d*x + c) - 20*(b*x + a)^2*B*a^4*c*d^7*f*g^3*n/
(d*x + c)^2 + 30*(b*x + a)^3*B*a^3*c^2*d^7*f*g^3*n/(d*x + c)^3 - 20*(b*x +
a)^4*B*a^2*c^3*d^7*f*g^3*n/(d*x + c)^4 + B*b^6*c^6*g^4*n - B*a*b^5*c^5*d*g^
4*n - 5*(b*x + a)*B*b^5*c^6*d*g^4*n/(d*x + c) + 5*(b*x + a)*B*a*b^4*c^5*d^2
*g^4*n/(d*x + c) + 10*(b*x + a)^2*B*b^4*c^6*d^2*g^4*n/(d*x + c)^2 - 10*(b*x
 + a)^2*B*a*b^3*c^5*d^3*g^4*n/(d*x + c)^2 - 10*(b*x + a)^3*B*b^3*c^6*d^3*g^
4*n/(d*x + c)^3 + 10*(b*x + a)^3*B*a*b^2*c^5*d^4*g^4*n/(d*x + c)^3 + 5*(b*x
 + a)^4*B*b^2*c^6*d^4*g^4*n/(d*x + c)^4 - B*a^5*b*c*d^5*g^4*n + 5*(b*x + a)
```

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*B*a^4*b*c^2*d^5*g^4*n/(d*x + c) - 10*(b*x + a)^2*B*a^3*b*c^3*d^5*g^4*n/(d*
x + c)^2 + 10*(b*x + a)^3*B*a^2*b*c^4*d^5*g^4*n/(d*x + c)^3 - 10*(b*x + a)^
4*B*a*b*c^5*d^5*g^4*n/(d*x + c)^4 + B*a^6*d^6*g^4*n - 5*(b*x + a)*B*a^5*c*d
^6*g^4*n/(d*x + c) + 10*(b*x + a)^2*B*a^4*c^2*d^6*g^4*n/(d*x + c)^2 - 10*(b
*x + a)^3*B*a^3*c^3*d^6*g^4*n/(d*x + c)^3 + 5*(b*x + a)^4*B*a^2*c^4*d^6*g^4
*n/(d*x + c)^4)*log((b*x + a)/(d*x + c))/(b^5*d^5 - 5*(b*x + a)*b^4*d^6/(d*
x + c) + 10*(b*x + a)^2*b^3*d^7/(d*x + c)^2 - 10*(b*x + a)^3*b^2*d^8/(d*x +
 c)^3 + 5*(b*x + a)^4*b*d^9/(d*x + c)^4 - (b*x + a)^5*d^10/(d*x + c)^5) - (
120*B*b^10*c^3*d^3*f^3*g*n - 360*B*a*b^9*c^2*d^4*f^3*g*n - 480*(b*x + a)*B*
b^9*c^3*d^4*f^3*g*n/(d*x + c) + 360*B*a^2*b^8*c*d^5*f^3*g*n + 1440*(b*x + a
)*B*a*b^8*c^2*d^5*f^3*g*n/(d*x + c) + 720*(b*x + a)^2*B*b^8*c^3*d^5*f^3*g*n
/(d*x + c)^2 - 120*B*a^3*b^7*d^6*f^3*g*n - 1440*(b*x + a)*B*a^2*b^7*c*d^6*f
^3*g*n/(d*x + c) - 2160*(b*x + a)^2*B*a*b^7*c^2*d^6*f^3*g*n/(d*x + c)^2 - 4
80*(b*x + a)^3*B*b^7*c^3*d^6*f^3*g*n/(d*x + c)^3 + 480*(b*x + a)*B*a^3*b^6*
d^7*f^3*g*n/(d*x + c) + 2160*(b*x + a)^2*B*a^2*b^6*c*d^7*f^3*g*n/(d*x + c)^
2 + 1440*(b*x + a)^3*B*a*b^6*c^2*d^7*f^3*g*n/(d*x + c)^3 + 120*(b*x + a)^4*
B*b^6*c^3*d^7*f^3*g*n/(d*x + c)^4 - 720*(b*x + a)^2*B*a^3*b^5*d^8*f^3*g*n/(
d*x + c)^2 - 1440*(b*x + a)^3*B*a^2*b^5*c*d^8*f^3*g*n/(d*x + c)^3 - 360*(b*
x + a)^4*B*a*b^5*c^2*d^8*f^3*g*n/(d*x + c)^4 + 480*(b*x + a)^3*B*a^3*b^4*d^
9*f^3*g*n/(d*x + c)^3 + 360*(b*x + a)^4*B*a^2*b^4*c*d^9*f^3*g*n/(d*x + c)^4
 - 120*(b*x + a)^4*B*a^3*b^3*d^10*f^3*g*n/(d*x + c)^4 - 180*B*b^10*c^4*d^2*
f^2*g^2*n + 360*B*a*b^9*c^3*d^3*f^2*g^2*n + 780*(b*x + a)*B*b^9*c^4*d^3*f^2
*g^2*n/(d*x + c) - 1680*(b*x + a)*B*a*b^8*c^3*d^4*f^2*g^2*n/(d*x + c) - 126
0*(b*x + a)^2*B*b^8*c^4*d^4*f^2*g^2*n/(d*x + c)^2 - 360*B*a^3*b^7*c*d^5*f^2
*g^2*n + 360*(b*x + a)*B*a^2*b^7*c^2*d^5*f^2*g^2*n/(d*x + c) + 2880*(b*x +
a)^2*B*a*b^7*c^3*d^5*f^2*g^2*n/(d*x + c)^2 + 900*(b*x + a)^3*B*b^7*c^4*d^5*
f^2*g^2*n/(d*x + c)^3 + 180*B*a^4*b^6*d^6*f^2*g^2*n + 1200*(b*x + a)*B*a^3*
b^6*c*d^6*f^2*g^2*n/(d*x + c) - 1080*(b*x + a)^2*B*a^2*b^6*c^2*d^6*f^2*g^2*
n/(d*x + c)^2 - 2160*(b*x + a)^3*B*a*b^6*c^3*d^6*f^2*g^2*n/(d*x + c)^3 - 24
0*(b*x + a)^4*B*b^6*c^4*d^6*f^2*g^2*n/(d*x + c)^4 - 660*(b*x + a)*B*a^4*b^5
*d^7*f^2*g^2*n/(d*x + c) - 1440*(b*x + a)^2*B*a^3*b^5*c*d^7*f^2*g^2*n/(d*x
+ c)^2 + 1080*(b*x + a)^3*B*a^2*b^5*c^2*d^7*f^2*g^2*n/(d*x + c)^3 + 600*(b*
x + a)^4*B*a*b^5*c^3*d^7*f^2*g^2*n/(d*x + c)^4 + 900*(b*x + a)^2*B*a^4*b^4*
d^8*f^2*g^2*n/(d*x + c)^2 + 720*(b*x + a)^3*B*a^3*b^4*c*d^8*f^2*g^2*n/(d*x
+ c)^3 - 360*(b*x + a)^4*B*a^2*b^4*c^2*d^8*f^2*g^2*n/(d*x + c)^4 - 540*(b*x
 + a)^3*B*a^4*b^3*d^9*f^2*g^2*n/(d*x + c)^3 - 120*(b*x + a)^4*B*a^3*b^3*c*d
^9*f^2*g^2*n/(d*x + c)^4 + 120*(b*x + a)^4*B*a^4*b^2*d^10*f^2*g^2*n/(d*x +
c)^4 + 110*B*b^10*c^5*d*f*g^3*n - 190*B*a*b^9*c^4*d^2*f*g^3*n - 490*(b*x +
a)*B*b^9*c^5*d^2*f*g^3*n/(d*x + c) + 20*B*a^2*b^8*c^3*d^3*f*g^3*n + 890*(b*
x + a)*B*a*b^8*c^4*d^3*f*g^3*n/(d*x + c) + 830*(b*x + a)^2*B*b^8*c^5*d^3*f*
g^3*n/(d*x + c)^2 - 20*B*a^3*b^7*c^2*d^4*f*g^3*n - 100*(b*x + a)*B*a^2*b^7*
c^3*d^4*f*g^3*n/(d*x + c) - 1630*(b*x + a)^2*B*a*b^7*c^4*d^4*f*g^3*n/(d*x +
 c)^2 - 630*(b*x + a)^3*B*b^7*c^5*d^4*f*g^3*n/(d*x + c)^3 + 190*B*a^4*b^6*c
*d^5*f*g^3*n - 140*(b*x + a)*B*a^3*b^6*c^2*d^5*f*g^3*n/(d*x + c) + 380*(b*x
 + a)^2*B*a^2*b^6*c^3*d^5*f*g^3*n/(d*x + c)^2 + 1350*(b*x + a)^3*B*a*b^6*c^
4*d^5*f*g^3*n/(d*x + c)^3 + 180*(b*x + a)^4*B*b^6*c^5*d^5*f*g^3*n/(d*x + c)
^4 - 110*B*a^5*b^5*d^6*f*g^3*n - 530*(b*x + a)*B*a^4*b^5*c*d^6*f*g^3*n/(d*x
 + c) + 340*(b*x + a)^2*B*a^3*b^5*c^2*d^6*f*g^3*n/(d*x + c)^2 - 540*(b*x +
a)^3*B*a^2*b^5*c^3*d^6*f*g^3*n/(d*x + c)^3 - 420*(b*x + a)^4*B*a*b^5*c^4*d^
6*f*g^3*n/(d*x + c)^4 + 370*(b*x + a)*B*a^5*b^4*d^7*f*g^3*n/(d*x + c) + 550
*(b*x + a)^2*B*a^4*b^4*c*d^7*f*g^3*n/(d*x + c)^2 - 180*(b*x + a)^3*B*a^3*b^
4*c^2*d^7*f*g^3*n/(d*x + c)^3 + 240*(b*x + a)^4*B*a^2*b^4*c^3*d^7*f*g^3*n/(
d*x + c)^4 - 470*(b*x + a)^2*B*a^5*b^3*d^8*f*g^3*n/(d*x + c)^2 - 270*(b*x +
 a)^3*B*a^4*b^3*c*d^8*f*g^3*n/(d*x + c)^3 + 270*(b*x + a)^3*B*a^5*b^2*d^9*f
*g^3*n/(d*x + c)^3 + 60*(b*x + a)^4*B*a^4*b^2*c*d^9*f*g^3*n/(d*x + c)^4 - 6
0*(b*x + a)^4*B*a^5*b*d^10*f*g^3*n/(d*x + c)^4 - 25*B*b^10*c^6*g^4*n + 40*B
*a*b^9*c^5*d*g^4*n + 113*(b*x + a)*B*b^9*c^6*d*g^4*n/(d*x + c) - 5*B*a^2*b^
8*c^4*d^2*g^4*n - 188*(b*x + a)*B*a*b^8*c^5*d^2*g^4*n/(d*x + c) - 196*(b*x
+ a)^2*B*b^8*c^6*d^2*g^4*n/(d*x + c)^2 + 25*(b*x + a)*B*a^2*b^7*c^4*d^3*g^4
```

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*n/(d*x + c) + 346*(b*x + a)^2*B*a*b^7*c^5*d^3*g^4*n/(d*x + c)^2 + 156*(b*x
 + a)^3*B*b^7*c^6*d^3*g^4*n/(d*x + c)^3 + 5*B*a^4*b^6*c^2*d^4*g^4*n - 50*(b
*x + a)^2*B*a^2*b^6*c^4*d^4*g^4*n/(d*x + c)^2 - 306*(b*x + a)^3*B*a*b^6*c^5
*d^4*g^4*n/(d*x + c)^3 - 48*(b*x + a)^4*B*b^6*c^6*d^4*g^4*n/(d*x + c)^4 - 4
0*B*a^5*b^5*c*d^5*g^4*n + 35*(b*x + a)*B*a^4*b^5*c^2*d^5*g^4*n/(d*x + c) -
60*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^4*n/(d*x + c)^2 + 90*(b*x + a)^3*B*a^2*b
^5*c^4*d^5*g^4*n/(d*x + c)^3 + 108*(b*x + a)^4*B*a*b^5*c^5*d^5*g^4*n/(d*x +
 c)^4 + 25*B*a^6*b^4*d^6*g^4*n + 92*(b*x + a)*B*a^5*b^4*c*d^6*g^4*n/(d*x +
c) - 40*(b*x + a)^2*B*a^4*b^4*c^2*d^6*g^4*n/(d*x + c)^2 + 60*(b*x + a)^3*B*
a^3*b^4*c^3*d^6*g^4*n/(d*x + c)^3 - 60*(b*x + a)^4*B*a^2*b^4*c^4*d^6*g^4*n/
(d*x + c)^4 - 77*(b*x + a)*B*a^6*b^3*d^7*g^4*n/(d*x + c) - 94*(b*x + a)^2*B
*a^5*b^3*c*d^7*g^4*n/(d*x + c)^2 + 94*(b*x + a)^2*B*a^6*b^2*d^8*g^4*n/(d*x
+ c)^2 + 54*(b*x + a)^3*B*a^5*b^2*c*d^8*g^4*n/(d*x + c)^3 - 54*(b*x + a)^3*
B*a^6*b*d^9*g^4*n/(d*x + c)^3 - 12*(b*x + a)^4*B*a^5*b*c*d^9*g^4*n/(d*x + c
)^4 + 12*(b*x + a)^4*B*a^6*d^10*g^4*n/(d*x + c)^4 - 60*A*b^10*c^2*d^4*f^4 -
 60*B*b^10*c^2*d^4*f^4 + 120*A*a*b^9*c*d^5*f^4 + 120*B*a*b^9*c*d^5*f^4 + 24
0*(b*x + a)*A*b^9*c^2*d^5*f^4/(d*x + c) + 240*(b*x + a)*B*b^9*c^2*d^5*f^4/(
d*x + c) - 60*A*a^2*b^8*d^6*f^4 - 60*B*a^2*b^8*d^6*f^4 - 480*(b*x + a)*A*a*
b^8*c*d^6*f^4/(d*x + c) - 480*(b*x + a)*B*a*b^8*c*d^6*f^4/(d*x + c) - 360*(
b*x + a)^2*A*b^8*c^2*d^6*f^4/(d*x + c)^2 - 360*(b*x + a)^2*B*b^8*c^2*d^6*f^
4/(d*x + c)^2 + 240*(b*x + a)*A*a^2*b^7*d^7*f^4/(d*x + c) + 240*(b*x + a)*B
*a^2*b^7*d^7*f^4/(d*x + c) + 720*(b*x + a)^2*A*a*b^7*c*d^7*f^4/(d*x + c)^2
+ 720*(b*x + a)^2*B*a*b^7*c*d^7*f^4/(d*x + c)^2 + 240*(b*x + a)^3*A*b^7*c^2
*d^7*f^4/(d*x + c)^3 + 240*(b*x + a)^3*B*b^7*c^2*d^7*f^4/(d*x + c)^3 - 360*
(b*x + a)^2*A*a^2*b^6*d^8*f^4/(d*x + c)^2 - 360*(b*x + a)^2*B*a^2*b^6*d^8*f
^4/(d*x + c)^2 - 480*(b*x + a)^3*A*a*b^6*c*d^8*f^4/(d*x + c)^3 - 480*(b*x +
 a)^3*B*a*b^6*c*d^8*f^4/(d*x + c)^3 - 60*(b*x + a)^4*A*b^6*c^2*d^8*f^4/(d*x
 + c)^4 - 60*(b*x + a)^4*B*b^6*c^2*d^8*f^4/(d*x + c)^4 + 240*(b*x + a)^3*A*
a^2*b^5*d^9*f^4/(d*x + c)^3 + 240*(b*x + a)^3*B*a^2*b^5*d^9*f^4/(d*x + c)^3
 + 120*(b*x + a)^4*A*a*b^5*c*d^9*f^4/(d*x + c)^4 + 120*(b*x + a)^4*B*a*b^5*
c*d^9*f^4/(d*x + c)^4 - 60*(b*x + a)^4*A*a^2*b^4*d^10*f^4/(d*x + c)^4 - 60*
(b*x + a)^4*B*a^2*b^4*d^10*f^4/(d*x + c)^4 + 120*A*b^10*c^3*d^3*f^3*g + 120
*B*b^10*c^3*d^3*f^3*g - 120*A*a*b^9*c^2*d^4*f^3*g - 120*B*a*b^9*c^2*d^4*f^3
*g - 600*(b*x + a)*A*b^9*c^3*d^4*f^3*g/(d*x + c) - 600*(b*x + a)*B*b^9*c^3*
d^4*f^3*g/(d*x + c) - 120*A*a^2*b^8*c*d^5*f^3*g - 120*B*a^2*b^8*c*d^5*f^3*g
 + 840*(b*x + a)*A*a*b^8*c^2*d^5*f^3*g/(d*x + c) + 840*(b*x + a)*B*a*b^8*c^
2*d^5*f^3*g/(d*x + c) + 1080*(b*x + a)^2*A*b^8*c^3*d^5*f^3*g/(d*x + c)^2 +
1080*(b*x + a)^2*B*b^8*c^3*d^5*f^3*g/(d*x + c)^2 + 120*A*a^3*b^7*d^6*f^3*g
+ 120*B*a^3*b^7*d^6*f^3*g + 120*(b*x + a)*A*a^2*b^7*c*d^6*f^3*g/(d*x + c) +
 120*(b*x + a)*B*a^2*b^7*c*d^6*f^3*g/(d*x + c) - 1800*(b*x + a)^2*A*a*b^7*c
^2*d^6*f^3*g/(d*x + c)^2 - 1800*(b*x + a)^2*B*a*b^7*c^2*d^6*f^3*g/(d*x + c)
^2 - 840*(b*x + a)^3*A*b^7*c^3*d^6*f^3*g/(d*x + c)^3 - 840*(b*x + a)^3*B*b^
7*c^3*d^6*f^3*g/(d*x + c)^3 - 360*(b*x + a)*A*a^3*b^6*d^7*f^3*g/(d*x + c) -
 360*(b*x + a)*B*a^3*b^6*d^7*f^3*g/(d*x + c) + 360*(b*x + a)^2*A*a^2*b^6*c*
d^7*f^3*g/(d*x + c)^2 + 360*(b*x + a)^2*B*a^2*b^6*c*d^7*f^3*g/(d*x + c)^2 +
 1560*(b*x + a)^3*A*a*b^6*c^2*d^7*f^3*g/(d*x + c)^3 + 1560*(b*x + a)^3*B*a*
b^6*c^2*d^7*f^3*g/(d*x + c)^3 + 240*(b*x + a)^4*A*b^6*c^3*d^7*f^3*g/(d*x +
c)^4 + 240*(b*x + a)^4*B*b^6*c^3*d^7*f^3*g/(d*x + c)^4 + 360*(b*x + a)^2*A*
a^3*b^5*d^8*f^3*g/(d*x + c)^2 + 360*(b*x + a)^2*B*a^3*b^5*d^8*f^3*g/(d*x +
c)^2 - 600*(b*x + a)^3*A*a^2*b^5*c*d^8*f^3*g/(d*x + c)^3 - 600*(b*x + a)^3*
B*a^2*b^5*c*d^8*f^3*g/(d*x + c)^3 - 480*(b*x + a)^4*A*a*b^5*c^2*d^8*f^3*g/(
d*x + c)^4 - 480*(b*x + a)^4*B*a*b^5*c^2*d^8*f^3*g/(d*x + c)^4 - 120*(b*x +
 a)^3*A*a^3*b^4*d^9*f^3*g/(d*x + c)^3 - 120*(b*x + a)^3*B*a^3*b^4*d^9*f^3*g
/(d*x + c)^3 + 240*(b*x + a)^4*A*a^2*b^4*c*d^9*f^3*g/(d*x + c)^4 + 240*(b*x
 + a)^4*B*a^2*b^4*c*d^9*f^3*g/(d*x + c)^4 - 120*A*b^10*c^4*d^2*f^2*g^2 - 12
0*B*b^10*c^4*d^2*f^2*g^2 + 120*A*a*b^9*c^3*d^3*f^2*g^2 + 120*B*a*b^9*c^3*d^
3*f^2*g^2 + 600*(b*x + a)*A*b^9*c^4*d^3*f^2*g^2/(d*x + c) + 600*(b*x + a)*B
*b^9*c^4*d^3*f^2*g^2/(d*x + c) - 600*(b*x + a)*A*a*b^8*c^3*d^4*f^2*g^2/(d*x
 + c) - 600*(b*x + a)*B*a*b^8*c^3*d^4*f^2*g^2/(d*x + c) - 1200*(b*x + a)^2*
```

```
A*b^8*c^4*d^4*f^2*g^2/(d*x + c)^2 - 1200*(b*x + a)^2*B*b^8*c^4*d^4*f^2*g^2/
(d*x + c)^2 + 120*A*a^3*b^7*c*d^5*f^2*g^2 + 120*B*a^3*b^7*c*d^5*f^2*g^2 - 3
60*(b*x + a)*A*a^2*b^7*c^2*d^5*f^2*g^2/(d*x + c) - 360*(b*x + a)*B*a^2*b^7*
c^2*d^5*f^2*g^2/(d*x + c) + 1560*(b*x + a)^2*A*a*b^7*c^3*d^5*f^2*g^2/(d*x +
 c)^2 + 1560*(b*x + a)^2*B*a*b^7*c^3*d^5*f^2*g^2/(d*x + c)^2 + 1080*(b*x +
a)^3*A*b^7*c^4*d^5*f^2*g^2/(d*x + c)^3 + 1080*(b*x + a)^3*B*b^7*c^4*d^5*f^2
*g^2/(d*x + c)^3 - 120*A*a^4*b^6*d^6*f^2*g^2 - 120*B*a^4*b^6*d^6*f^2*g^2 +
120*(b*x + a)*A*a^3*b^6*c*d^6*f^2*g^2/(d*x + c) + 120*(b*x + a)*B*a^3*b^6*c
*d^6*f^2*g^2/(d*x + c) + 360*(b*x + a)^2*A*a^2*b^6*c^2*d^6*f^2*g^2/(d*x + c
)^2 + 360*(b*x + a)^2*B*a^2*b^6*c^2*d^6*f^2*g^2/(d*x + c)^2 - 1800*(b*x + a
)^3*A*a*b^6*c^3*d^6*f^2*g^2/(d*x + c)^3 - 1800*(b*x + a)^3*B*a*b^6*c^3*d^6*
f^2*g^2/(d*x + c)^3 - 360*(b*x + a)^4*A*b^6*c^4*d^6*f^2*g^2/(d*x + c)^4 - 3
60*(b*x + a)^4*B*b^6*c^4*d^6*f^2*g^2/(d*x + c)^4 + 240*(b*x + a)*A*a^4*b^5*
d^7*f^2*g^2/(d*x + c) + 240*(b*x + a)*B*a^4*b^5*d^7*f^2*g^2/(d*x + c) - 600
*(b*x + a)^2*A*a^3*b^5*c*d^7*f^2*g^2/(d*x + c)^2 - 600*(b*x + a)^2*B*a^3*b^
5*c*d^7*f^2*g^2/(d*x + c)^2 + 360*(b*x + a)^3*A*a^2*b^5*c^2*d^7*f^2*g^2/(d*
x + c)^3 + 360*(b*x + a)^3*B*a^2*b^5*c^2*d^7*f^2*g^2/(d*x + c)^3 + 720*(b*x
 + a)^4*A*a*b^5*c^3*d^7*f^2*g^2/(d*x + c)^4 + 720*(b*x + a)^4*B*a*b^5*c^3*d
^7*f^2*g^2/(d*x + c)^4 - 120*(b*x + a)^2*A*a^4*b^4*d^8*f^2*g^2/(d*x + c)^2
- 120*(b*x + a)^2*B*a^4*b^4*d^8*f^2*g^2/(d*x + c)^2 + 360*(b*x + a)^3*A*a^3
*b^4*c*d^8*f^2*g^2/(d*x + c)^3 + 360*(b*x + a)^3*B*a^3*b^4*c*d^8*f^2*g^2/(d
*x + c)^3 - 360*(b*x + a)^4*A*a^2*b^4*c^2*d^8*f^2*g^2/(d*x + c)^4 - 360*(b*
x + a)^4*B*a^2*b^4*c^2*d^8*f^2*g^2/(d*x + c)^4 + 60*A*b^10*c^5*d*f*g^3 + 60
*B*b^10*c^5*d*f*g^3 - 60*A*a*b^9*c^4*d^2*f*g^3 - 60*B*a*b^9*c^4*d^2*f*g^3 -
 300*(b*x + a)*A*b^9*c^5*d^2*f*g^3/(d*x + c) - 300*(b*x + a)*B*b^9*c^5*d^2*
f*g^3/(d*x + c) + 300*(b*x + a)*A*a*b^8*c^4*d^3*f*g^3/(d*x + c) + 300*(b*x
+ a)*B*a*b^8*c^4*d^3*f*g^3/(d*x + c) + 600*(b*x + a)^2*A*b^8*c^5*d^3*f*g^3/
(d*x + c)^2 + 600*(b*x + a)^2*B*b^8*c^5*d^3*f*g^3/(d*x + c)^2 - 600*(b*x +
a)^2*A*a*b^7*c^4*d^4*f*g^3/(d*x + c)^2 - 600*(b*x + a)^2*B*a*b^7*c^4*d^4*f*
g^3/(d*x + c)^2 - 600*(b*x + a)^3*A*b^7*c^5*d^4*f*g^3/(d*x + c)^3 - 600*(b*
x + a)^3*B*b^7*c^5*d^4*f*g^3/(d*x + c)^3 - 60*A*a^4*b^6*c*d^5*f*g^3 - 60*B*
a^4*b^6*c*d^5*f*g^3 + 240*(b*x + a)*A*a^3*b^6*c^2*d^5*f*g^3/(d*x + c) + 240
*(b*x + a)*B*a^3*b^6*c^2*d^5*f*g^3/(d*x + c) - 360*(b*x + a)^2*A*a^2*b^6*c^
3*d^5*f*g^3/(d*x + c)^2 - 360*(b*x + a)^2*B*a^2*b^6*c^3*d^5*f*g^3/(d*x + c)
^2 + 840*(b*x + a)^3*A*a*b^6*c^4*d^5*f*g^3/(d*x + c)^3 + 840*(b*x + a)^3*B*
a*b^6*c^4*d^5*f*g^3/(d*x + c)^3 + 240*(b*x + a)^4*A*b^6*c^5*d^5*f*g^3/(d*x
+ c)^4 + 240*(b*x + a)^4*B*b^6*c^5*d^5*f*g^3/(d*x + c)^4 + 60*A*a^5*b^5*d^6
*f*g^3 + 60*B*a^5*b^5*d^6*f*g^3 - 180*(b*x + a)*A*a^4*b^5*c*d^6*f*g^3/(d*x
+ c) - 180*(b*x + a)*B*a^4*b^5*c*d^6*f*g^3/(d*x + c) + 120*(b*x + a)^2*A*a^
3*b^5*c^2*d^6*f*g^3/(d*x + c)^2 + 120*(b*x + a)^2*B*a^3*b^5*c^2*d^6*f*g^3/(
d*x + c)^2 + 120*(b*x + a)^3*A*a^2*b^5*c^3*d^6*f*g^3/(d*x + c)^3 + 120*(b*x
 + a)^3*B*a^2*b^5*c^3*d^6*f*g^3/(d*x + c)^3 - 480*(b*x + a)^4*A*a*b^5*c^4*d
^6*f*g^3/(d*x + c)^4 - 480*(b*x + a)^4*B*a*b^5*c^4*d^6*f*g^3/(d*x + c)^4 -
60*(b*x + a)*A*a^5*b^4*d^7*f*g^3/(d*x + c) - 60*(b*x + a)*B*a^5*b^4*d^7*f*g
^3/(d*x + c) + 240*(b*x + a)^2*A*a^4*b^4*c*d^7*f*g^3/(d*x + c)^2 + 240*(b*x
 + a)^2*B*a^4*b^4*c*d^7*f*g^3/(d*x + c)^2 - 360*(b*x + a)^3*A*a^3*b^4*c^2*d
^7*f*g^3/(d*x + c)^3 - 360*(b*x + a)^3*B*a^3*b^4*c^2*d^7*f*g^3/(d*x + c)^3
+ 240*(b*x + a)^4*A*a^2*b^4*c^3*d^7*f*g^3/(d*x + c)^4 + 240*(b*x + a)^4*B*a
^2*b^4*c^3*d^7*f*g^3/(d*x + c)^4 - 12*A*b^10*c^6*g^4 - 12*B*b^10*c^6*g^4 +
12*A*a*b^9*c^5*d*g^4 + 12*B*a*b^9*c^5*d*g^4 + 60*(b*x + a)*A*b^9*c^6*d*g^4/
(d*x + c) + 60*(b*x + a)*B*b^9*c^6*d*g^4/(d*x + c) - 60*(b*x + a)*A*a*b^8*c
^5*d^2*g^4/(d*x + c) - 60*(b*x + a)*B*a*b^8*c^5*d^2*g^4/(d*x + c) - 120*(b*
x + a)^2*A*b^8*c^6*d^2*g^4/(d*x + c)^2 - 120*(b*x + a)^2*B*b^8*c^6*d^2*g^4/
(d*x + c)^2 + 120*(b*x + a)^2*A*a*b^7*c^5*d^3*g^4/(d*x + c)^2 + 120*(b*x +
a)^2*B*a*b^7*c^5*d^3*g^4/(d*x + c)^2 + 120*(b*x + a)^3*A*b^7*c^6*d^3*g^4/(d
*x + c)^3 + 120*(b*x + a)^3*B*b^7*c^6*d^3*g^4/(d*x + c)^3 - 120*(b*x + a)^3
*A*a*b^6*c^5*d^4*g^4/(d*x + c)^3 - 120*(b*x + a)^3*B*a*b^6*c^5*d^4*g^4/(d*x
 + c)^3 - 60*(b*x + a)^4*A*b^6*c^6*d^4*g^4/(d*x + c)^4 - 60*(b*x + a)^4*B*b
^6*c^6*d^4*g^4/(d*x + c)^4 + 12*A*a^5*b^5*c*d^5*g^4 + 12*B*a^5*b^5*c*d^5*g^
```

```
4 - 60*(b*x + a)*A*a^4*b^5*c^2*d^5*g^4/(d*x + c) - 60*(b*x + a)*B*a^4*b^5*c
^2*d^5*g^4/(d*x + c) + 120*(b*x + a)^2*A*a^3*b^5*c^3*d^5*g^4/(d*x + c)^2 +
120*(b*x + a)^2*B*a^3*b^5*c^3*d^5*g^4/(d*x + c)^2 - 120*(b*x + a)^3*A*a^2*b
^5*c^4*d^5*g^4/(d*x + c)^3 - 120*(b*x + a)^3*B*a^2*b^5*c^4*d^5*g^4/(d*x + c
)^3 + 120*(b*x + a)^4*A*a*b^5*c^5*d^5*g^4/(d*x + c)^4 + 120*(b*x + a)^4*B*a
*b^5*c^5*d^5*g^4/(d*x + c)^4 - 12*A*a^6*b^4*d^6*g^4 - 12*B*a^6*b^4*d^6*g^4
+ 60*(b*x + a)*A*a^5*b^4*c*d^6*g^4/(d*x + c) + 60*(b*x + a)*B*a^5*b^4*c*d^6
*g^4/(d*x + c) - 120*(b*x + a)^2*A*a^4*b^4*c^2*d^6*g^4/(d*x + c)^2 - 120*(b
*x + a)^2*B*a^4*b^4*c^2*d^6*g^4/(d*x + c)^2 + 120*(b*x + a)^3*A*a^3*b^4*c^3
*d^6*g^4/(d*x + c)^3 + 120*(b*x + a)^3*B*a^3*b^4*c^3*d^6*g^4/(d*x + c)^3 -
60*(b*x + a)^4*A*a^2*b^4*c^4*d^6*g^4/(d*x + c)^4 - 60*(b*x + a)^4*B*a^2*b^4
*c^4*d^6*g^4/(d*x + c)^4)/(b^9*d^5 - 5*(b*x + a)*b^8*d^6/(d*x + c) + 10*(b*
x + a)^2*b^7*d^7/(d*x + c)^2 - 10*(b*x + a)^3*b^6*d^8/(d*x + c)^3 + 5*(b*x
+ a)^4*b^5*d^9/(d*x + c)^4 - (b*x + a)^5*b^4*d^10/(d*x + c)^5) + 12*(5*B*b^
6*c^2*d^4*f^4*n - 10*B*a*b^5*c*d^5*f^4*n + 5*B*a^2*b^4*d^6*f^4*n - 10*B*b^6
*c^3*d^3*f^3*g*n + 10*B*a*b^5*c^2*d^4*f^3*g*n + 10*B*a^2*b^4*c*d^5*f^3*g*n
- 10*B*a^3*b^3*d^6*f^3*g*n + 10*B*b^6*c^4*d^2*f^2*g^2*n - 10*B*a*b^5*c^3*d^
3*f^2*g^2*n - 10*B*a^3*b^3*c*d^5*f^2*g^2*n + 10*B*a^4*b^2*d^6*f^2*g^2*n - 5
*B*b^6*c^5*d*f*g^3*n + 5*B*a*b^5*c^4*d^2*f*g^3*n + 5*B*a^4*b^2*c*d^5*f*g^3*
n - 5*B*a^5*b*d^6*f*g^3*n + B*b^6*c^6*g^4*n - B*a*b^5*c^5*d*g^4*n - B*a^5*b
*c*d^5*g^4*n + B*a^6*d^6*g^4*n)*log(b - (b*x + a)*d/(d*x + c))/(b^5*d^5) -
12*(5*B*b^6*c^2*d^4*f^4*n - 10*B*a*b^5*c*d^5*f^4*n + 5*B*a^2*b^4*d^6*f^4*n
- 10*B*b^6*c^3*d^3*f^3*g*n + 10*B*a*b^5*c^2*d^4*f^3*g*n + 10*B*a^2*b^4*c*d^
5*f^3*g*n - 10*B*a^3*b^3*d^6*f^3*g*n + 10*B*b^6*c^4*d^2*f^2*g^2*n - 10*B*a*
b^5*c^3*d^3*f^2*g^2*n - 10*B*a^3*b^3*c*d^5*f^2*g^2*n + 10*B*a^4*b^2*d^6*f^2
*g^2*n - 5*B*b^6*c^5*d*f*g^3*n + 5*B*a*b^5*c^4*d^2*f*g^3*n + 5*B*a^4*b^2*c*
d^5*f*g^3*n - 5*B*a^5*b*d^6*f*g^3*n + B*b^6*c^6*g^4*n - B*a*b^5*c^5*d*g^4*n
 - B*a^5*b*c*d^5*g^4*n + B*a^6*d^6*g^4*n)*log((b*x + a)/(d*x + c))/(b^5*d^5
))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.34, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)^{4} \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^4*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((g*x+f)^4*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.91, size = 631, normalized size = 1.73

$$\frac{1}{5}\,Bg^{4}x^{5}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{5}\,Ag^{4}x^{5}+Bfg^{3}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Afg^{3}x^{4}+2\,Bf^{2}g^{2}x^{3}\log\left(e\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/5*B*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*g^4*x^5 + B*f*
g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f*g^3*x^4 + 2*B*f^2*g^2*
x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*f^2*g^2*x^3 + 2*B*f^3*g*x^
2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*f^3*g*x^2 + 1/60*B*g^4*n*(12
*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4
)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 -
 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/6*B*f*g^3*n*(6*a^4*log(b*x + a)/b
^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d
 - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + B*f^2*g^2*n*(2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*B*f^3*g*n*(a^2*log(b*x + a)/b^2 - c^2
```

```
*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f^4*n*(a*log(b*x + a)/b - c*lo
g(d*x + c)/d) + B*f^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f^4*x
```

mupad [B] time = 4.68, size = 1433, normalized size = 3.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^4*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x^4*((5*A*a*d*g^4 + 5*A*b*c*g^4 + 20*A*b*d*f*g^3 + B*a*d*g^4*n - B*b*c*g^4*
n)/(20*b*d) - (A*g^4*(5*a*d + 5*b*c))/(20*b*d)) + x^2*((20*A*a*c*f*g^3 + 20
*A*b*d*f^3*g + 30*A*a*d*f^2*g^2 + 30*A*b*c*f^2*g^2 + 10*B*a*d*f^2*g^2*n - 1
0*B*b*c*f^2*g^2*n)/(10*b*d) + ((5*a*d + 5*b*c)*((((5*A*a*d*g^4 + 5*A*b*c*g^
4 + 20*A*b*d*f*g^3 + B*a*d*g^4*n - B*b*c*g^4*n)/(5*b*d) - (A*g^4*(5*a*d + 5
*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 +
20*A*b*c*f*g^3 + 30*A*b*d*f^2*g^2 + 5*B*a*d*f*g^3*n - 5*B*b*c*f*g^3*n)/(5*b
*d) + (A*a*c*g^4)/(b*d)))/(10*b*d) - (a*c*((5*A*a*d*g^4 + 5*A*b*c*g^4 + 20*
A*b*d*f*g^3 + B*a*d*g^4*n - B*b*c*g^4*n)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/
(5*b*d)))/(2*b*d)) - x^3*((((5*A*a*d*g^4 + 5*A*b*c*g^4 + 20*A*b*d*f*g^3 + B
*a*d*g^4*n - B*b*c*g^4*n)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d
 + 5*b*c))/(15*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 30*A
*b*d*f^2*g^2 + 5*B*a*d*f*g^3*n - 5*B*b*c*f*g^3*n)/(15*b*d) + (A*a*c*g^4)/(3
*b*d)) + x*((5*A*b*d*f^4 + 20*A*a*d*f^3*g + 20*A*b*c*f^3*g + 30*A*a*c*f^2*g
^2 + 10*B*a*d*f^3*g*n - 10*B*b*c*f^3*g*n)/(5*b*d) - ((5*a*d + 5*b*c)*((20*A
*a*c*f*g^3 + 20*A*b*d*f^3*g + 30*A*a*d*f^2*g^2 + 30*A*b*c*f^2*g^2 + 10*B*a*
d*f^2*g^2*n - 10*B*b*c*f^2*g^2*n)/(5*b*d) + ((5*a*d + 5*b*c)*((((5*A*a*d*g^
4 + 5*A*b*c*g^4 + 20*A*b*d*f*g^3 + B*a*d*g^4*n - B*b*c*g^4*n)/(5*b*d) - (A*
g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*g^4 + 20*
A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 30*A*b*d*f^2*g^2 + 5*B*a*d*f*g^3*n - 5*B*b*c
*f*g^3*n)/(5*b*d) + (A*a*c*g^4)/(b*d)))/(5*b*d) - (a*c*((5*A*a*d*g^4 + 5*A*
b*c*g^4 + 20*A*b*d*f*g^3 + B*a*d*g^4*n - B*b*c*g^4*n)/(5*b*d) - (A*g^4*(5*a
*d + 5*b*c))/(5*b*d)))/(b*d)))/(5*b*d) + (a*c*((((5*A*a*d*g^4 + 5*A*b*c*g^4
 + 20*A*b*d*f*g^3 + B*a*d*g^4*n - B*b*c*g^4*n)/(5*b*d) - (A*g^4*(5*a*d + 5*
b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 + 2
0*A*b*c*f*g^3 + 30*A*b*d*f^2*g^2 + 5*B*a*d*f*g^3*n - 5*B*b*c*f*g^3*n)/(5*b*
d) + (A*a*c*g^4)/(b*d)))/(b*d)) + log(e*((a + b*x)/(c + d*x))^n)*((B*g^4*x^
5)/5 + B*f^4*x + 2*B*f^2*g^2*x^3 + 2*B*f^3*g*x^2 + B*f*g^3*x^4) + (A*g^4*x^
5)/5 + (log(a + b*x)*((B*a^5*g^4*n)/5 + B*a*b^4*f^4*n + 2*B*a^3*b^2*f^2*g^2
*n - B*a^4*b*f*g^3*n - 2*B*a^2*b^3*f^3*g*n))/b^5 - (log(c + d*x)*(B*c^5*g^4
*n + 5*B*c*d^4*f^4*n + 10*B*c^3*d^2*f^2*g^2*n - 5*B*c^4*d*f*g^3*n - 10*B*c^
2*d^3*f^3*g*n))/(5*d^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**4*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

3.58 $\int (f+gx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=235

$$-\frac{Bgnx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g}-Bn$$

```
[Out] -1/4*B*(-a*d+b*c)*g*(a^2*d^2*g^2-a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*
g+6*d^2*f^2))*n*x/b^3/d^3-1/8*B*(-a*d+b*c)*g^2*(-a*d*g-b*c*g+4*b*d*f)*n*x^2
/b^2/d^2-1/12*B*(-a*d+b*c)*g^3*n*x^3/b/d-1/4*B*(-a*g+b*f)^4*n*ln(b*x+a)/b^4
/g+1/4*(g*x+f)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/g+1/4*B*(-c*g+d*f)^4*n*ln(
d*x+c)/d^4/g
```

Rubi **[A]** time = 0.36, antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = $\{2525, 12, 72\}$

$$-\frac{Bgnx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g}-Bg$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*n*x)/(4*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g
 - a*d*g)*n*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*g^3*n*x^3)/(12*b*d) - (B*(b*f
 - a*g)^4*n*Log[a + b*x])/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(4*g) + (B*(d*f - c*g)^4*n*Log[c + d*x])/(4*d^4*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int (f+gx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx &= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4g} - \frac{(Bn)\int \frac{(bc-ad)(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g} \\
&= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4g} - \frac{(B(bc-ad)n)\int \frac{(f+gx)^4}{(a+bx)(c+dx)}\, d}{4g} \\
&= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4g} - \frac{(B(bc-ad)n)\int \left(\frac{g^2\left(a^2d^2g^2-ab\right.}{}\right.}{} \\
&= -\frac{B(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2\right.\right.}{4b^3d^3}
\end{aligned}
$$

Mathematica [**A**] time = 0.28, size = 219, normalized size = 0.93

$$
\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn\left(6bdg^2x(bc-ad)\left(a^2d^2g^2+abdg(cg-4df)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)+2b^3d^3g^4x^3(bc-ad)+3b^2d^2g^3\right.}{6b^4d^4}}{4g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (B*n*(6*b*d*(b*c - a*
d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g +
 c^2*g^2))*x + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2 + 2*
b^3*d^3*(b*c - a*d)*g^4*x^3 + 6*d^4*(b*f - a*g)^4*Log[a + b*x] - 6*b^4*(d*f
 - c*g)^4*Log[c + d*x]))/(6*b^4*d^4))/(4*g)
```

fricas [**B**] time = 1.61, size = 521, normalized size = 2.22

$$
\frac{6\,Ab^4d^4g^3x^4+2\left(12\,Ab^4d^4fg^2-\left(Bb^4cd^3-Bab^3d^4\right)g^3n\right)x^3+3\left(12\,Ab^4d^4f^2g-\left(4\left(Bb^4cd^3-Bab^3d^4\right)fg^2-\left(B\right.\right.\right.}{}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 + 2*(12*A*b^4*d^4*f*g^2 - (B*b^4*c*d^3 - B*a*b^3*
d^4)*g^3*n)*x^3 + 3*(12*A*b^4*d^4*f^2*g - (4*(B*b^4*c*d^3 - B*a*b^3*d^4)*f*
g^2 - (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g^3)*n)*x^2 + 6*(4*B*a*b^3*d^4*f^3 -
6*B*a^2*b^2*d^4*f^2*g + 4*B*a^3*b*d^4*f*g^2 - B*a^4*d^4*g^3)*n*log(b*x + a)
 - 6*(4*B*b^4*c*d^3*f^3 - 6*B*b^4*c^2*d^2*f^2*g + 4*B*b^4*c^3*d*f*g^2 - B*b
^4*c^4*g^3)*n*log(d*x + c) + 6*(4*A*b^4*d^4*f^3 - (6*(B*b^4*c*d^3 - B*a*b^3
*d^4)*f^2*g - 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*f*g^2 + (B*b^4*c^3*d - B*a^
3*b*d^4)*g^3)*n)*x + 6*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*d^4*f*g^2*x^3 + 6*B*b^4
*d^4*f^2*g*x^2 + 4*B*b^4*d^4*f^3*x)*log(e) + 6*(B*b^4*d^4*g^3*n*x^4 + 4*B*b
^4*d^4*f*g^2*n*x^3 + 6*B*b^4*d^4*f^2*g*n*x^2 + 4*B*b^4*d^4*f^3*n*x)*log((b*
x + a)/(d*x + c)))/(b^4*d^4)
```

giac [**B**] time = 9.22, size = 6660, normalized size = 28.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/24*(6*(4*B*b^5*c^2*d^3*f^3*n - 8*B*a*b^4*c*d^4*f^3*n - 12*(b*x + a)*B*b^4
*c^2*d^4*f^3*n/(d*x + c) + 4*B*a^2*b^3*d^5*f^3*n + 24*(b*x + a)*B*a*b^3*c*d
^5*f^3*n/(d*x + c) + 12*(b*x + a)^2*B*b^3*c^2*d^5*f^3*n/(d*x + c)^2 - 12*(b
*x + a)*B*a^2*b^2*d^6*f^3*n/(d*x + c) - 24*(b*x + a)^2*B*a*b^2*c*d^6*f^3*n/
(d*x + c)^2 - 4*(b*x + a)^3*B*b^2*c^2*d^6*f^3*n/(d*x + c)^3 + 12*(b*x + a)^
2*B*a^2*b*d^7*f^3*n/(d*x + c)^2 + 8*(b*x + a)^3*B*a*b*c*d^7*f^3*n/(d*x + c)
^3 - 4*(b*x + a)^3*B*a^2*d^8*f^3*n/(d*x + c)^3 - 6*B*b^5*c^3*d^2*f^2*g*n +
6*B*a*b^4*c^2*d^3*f^2*g*n + 24*(b*x + a)*B*b^4*c^3*d^3*f^2*g*n/(d*x + c) +
6*B*a^2*b^3*c*d^4*f^2*g*n - 36*(b*x + a)*B*a*b^3*c^2*d^4*f^2*g*n/(d*x + c)
- 30*(b*x + a)^2*B*b^3*c^3*d^4*f^2*g*n/(d*x + c)^2 - 6*B*a^3*b^2*d^5*f^2*g*
n + 54*(b*x + a)^2*B*a*b^2*c^2*d^5*f^2*g*n/(d*x + c)^2 + 12*(b*x + a)^3*B*b
^2*c^3*d^5*f^2*g*n/(d*x + c)^3 + 12*(b*x + a)*B*a^3*b*d^6*f^2*g*n/(d*x + c)
 - 18*(b*x + a)^2*B*a^2*b*c*d^6*f^2*g*n/(d*x + c)^2 - 24*(b*x + a)^3*B*a*b*
c^2*d^6*f^2*g*n/(d*x + c)^3 - 6*(b*x + a)^2*B*a^3*d^7*f^2*g*n/(d*x + c)^2 +
 12*(b*x + a)^3*B*a^2*c*d^7*f^2*g*n/(d*x + c)^3 + 4*B*b^5*c^4*d*f*g^2*n - 4
*B*a*b^4*c^3*d^2*f*g^2*n - 16*(b*x + a)*B*b^4*c^4*d^2*f*g^2*n/(d*x + c) + 1
6*(b*x + a)*B*a*b^3*c^3*d^3*f*g^2*n/(d*x + c) + 24*(b*x + a)^2*B*b^3*c^4*d^
3*f*g^2*n/(d*x + c)^2 - 4*B*a^3*b^2*c*d^4*f*g^2*n + 12*(b*x + a)*B*a^2*b^2*
c^2*d^4*f*g^2*n/(d*x + c) - 36*(b*x + a)^2*B*a*b^2*c^3*d^4*f*g^2*n/(d*x + c
)^2 - 12*(b*x + a)^3*B*b^2*c^4*d^4*f*g^2*n/(d*x + c)^3 + 4*B*a^4*b*d^5*f*g^
2*n - 8*(b*x + a)*B*a^3*b*c*d^5*f*g^2*n/(d*x + c) + 24*(b*x + a)^3*B*a*b*c^
3*d^5*f*g^2*n/(d*x + c)^3 - 4*(b*x + a)*B*a^4*d^6*f*g^2*n/(d*x + c) + 12*(b
*x + a)^2*B*a^3*c*d^6*f*g^2*n/(d*x + c)^2 - 12*(b*x + a)^3*B*a^2*c^2*d^6*f*
g^2*n/(d*x + c)^3 - B*b^5*c^5*g^3*n + B*a*b^4*c^4*d*g^3*n + 4*(b*x + a)*B*b
^4*c^5*d*g^3*n/(d*x + c) - 4*(b*x + a)*B*a*b^3*c^4*d^2*g^3*n/(d*x + c) - 6*
(b*x + a)^2*B*b^3*c^5*d^2*g^3*n/(d*x + c)^2 + 6*(b*x + a)^2*B*a*b^2*c^4*d^3
*g^3*n/(d*x + c)^2 + 4*(b*x + a)^3*B*b^2*c^5*d^3*g^3*n/(d*x + c)^3 + B*a^4*
b*c*d^4*g^3*n - 4*(b*x + a)*B*a^3*b*c^2*d^4*g^3*n/(d*x + c) + 6*(b*x + a)^2
*B*a^2*b*c^3*d^4*g^3*n/(d*x + c)^2 - 8*(b*x + a)^3*B*a*b*c^4*d^4*g^3*n/(d*x
 + c)^3 - B*a^5*d^5*g^3*n + 4*(b*x + a)*B*a^4*c*d^5*g^3*n/(d*x + c) - 6*(b*
x + a)^2*B*a^3*c^2*d^5*g^3*n/(d*x + c)^2 + 4*(b*x + a)^3*B*a^2*c^3*d^5*g^3*
n/(d*x + c)^3)*log((b*x + a)/(d*x + c))/(b^4*d^4 - 4*(b*x + a)*b^3*d^5/(d*x
 + c) + 6*(b*x + a)^2*b^2*d^6/(d*x + c)^2 - 4*(b*x + a)^3*b*d^7/(d*x + c)^3
 + (b*x + a)^4*d^8/(d*x + c)^4) - (36*B*b^8*c^3*d^2*f^2*g*n - 108*B*a*b^7*c
^2*d^3*f^2*g*n - 108*(b*x + a)*B*b^7*c^3*d^3*f^2*g*n/(d*x + c) + 108*B*a^2*
b^6*c*d^4*f^2*g*n + 324*(b*x + a)*B*a*b^6*c^2*d^4*f^2*g*n/(d*x + c) + 108*(
b*x + a)^2*B*b^6*c^3*d^4*f^2*g*n/(d*x + c)^2 - 36*B*a^3*b^5*d^5*f^2*g*n - 3
24*(b*x + a)*B*a^2*b^5*c*d^5*f^2*g*n/(d*x + c) - 324*(b*x + a)^2*B*a*b^5*c^
2*d^5*f^2*g*n/(d*x + c)^2 - 36*(b*x + a)^3*B*b^5*c^3*d^5*f^2*g*n/(d*x + c)^
3 + 108*(b*x + a)*B*a^3*b^4*d^6*f^2*g*n/(d*x + c) + 324*(b*x + a)^2*B*a^2*b
^4*c*d^6*f^2*g*n/(d*x + c)^2 + 108*(b*x + a)^3*B*a*b^4*c^2*d^6*f^2*g*n/(d*x
 + c)^3 - 108*(b*x + a)^2*B*a^3*b^3*d^7*f^2*g*n/(d*x + c)^2 - 108*(b*x + a)
^3*B*a^2*b^3*c*d^7*f^2*g*n/(d*x + c)^3 + 36*(b*x + a)^3*B*a^3*b^2*d^8*f^2*g
*n/(d*x + c)^3 - 36*B*b^8*c^4*d*f*g^2*n + 72*B*a*b^7*c^3*d^2*f*g^2*n + 120*
(b*x + a)*B*b^7*c^4*d^2*f*g^2*n/(d*x + c) - 264*(b*x + a)*B*a*b^6*c^3*d^3*f
*g^2*n/(d*x + c) - 132*(b*x + a)^2*B*b^6*c^4*d^3*f*g^2*n/(d*x + c)^2 - 72*B
*a^3*b^5*c*d^4*f*g^2*n + 72*(b*x + a)*B*a^2*b^5*c^2*d^4*f*g^2*n/(d*x + c) +
 312*(b*x + a)^2*B*a*b^5*c^3*d^4*f*g^2*n/(d*x + c)^2 + 48*(b*x + a)^3*B*b^5
*c^4*d^4*f*g^2*n/(d*x + c)^3 + 36*B*a^4*b^4*d^5*f*g^2*n + 168*(b*x + a)*B*a
^3*b^4*c*d^5*f*g^2*n/(d*x + c) - 144*(b*x + a)^2*B*a^2*b^4*c^2*d^5*f*g^2*n/
(d*x + c)^2 - 120*(b*x + a)^3*B*a*b^4*c^3*d^5*f*g^2*n/(d*x + c)^3 - 96*(b*x
 + a)*B*a^4*b^3*d^6*f*g^2*n/(d*x + c) - 120*(b*x + a)^2*B*a^3*b^3*c*d^6*f*g
^2*n/(d*x + c)^2 + 72*(b*x + a)^3*B*a^2*b^3*c^2*d^6*f*g^2*n/(d*x + c)^3 + 8
4*(b*x + a)^2*B*a^4*b^2*d^7*f*g^2*n/(d*x + c)^2 + 24*(b*x + a)^3*B*a^3*b^2*
c*d^7*f*g^2*n/(d*x + c)^3 - 24*(b*x + a)^3*B*a^4*b*d^8*f*g^2*n/(d*x + c)^3
+ 11*B*b^8*c^5*g^3*n - 19*B*a*b^7*c^4*d*g^3*n - 38*(b*x + a)*B*b^7*c^5*d*g^
3*n/(d*x + c) + 2*B*a^2*b^6*c^3*d^2*g^3*n + 70*(b*x + a)*B*a*b^6*c^4*d^2*g^
3*n/(d*x + c) + 45*(b*x + a)^2*B*b^6*c^5*d^2*g^3*n/(d*x + c)^2 - 2*B*a^3*b^
```

```
5*c^2*d^3*g^3*n - 8*(b*x + a)*B*a^2*b^5*c^3*d^3*g^3*n/(d*x + c) - 93*(b*x +
 a)^2*B*a*b^5*c^4*d^3*g^3*n/(d*x + c)^2 - 18*(b*x + a)^3*B*b^5*c^5*d^3*g^3*
n/(d*x + c)^3 + 19*B*a^4*b^4*c*d^4*g^3*n - 16*(b*x + a)*B*a^3*b^4*c^2*d^4*g
^3*n/(d*x + c) + 30*(b*x + a)^2*B*a^2*b^4*c^3*d^4*g^3*n/(d*x + c)^2 + 42*(b
*x + a)^3*B*a*b^4*c^4*d^4*g^3*n/(d*x + c)^3 - 11*B*a^5*b^3*d^5*g^3*n - 34*(
b*x + a)*B*a^4*b^3*c*d^5*g^3*n/(d*x + c) + 18*(b*x + a)^2*B*a^3*b^3*c^2*d^5
*g^3*n/(d*x + c)^2 - 24*(b*x + a)^3*B*a^2*b^3*c^3*d^5*g^3*n/(d*x + c)^3 + 2
6*(b*x + a)*B*a^5*b^2*d^6*g^3*n/(d*x + c) + 21*(b*x + a)^2*B*a^4*b^2*c*d^6*
g^3*n/(d*x + c)^2 - 21*(b*x + a)^2*B*a^5*b*d^7*g^3*n/(d*x + c)^2 - 6*(b*x +
 a)^3*B*a^4*b*c*d^7*g^3*n/(d*x + c)^3 + 6*(b*x + a)^3*B*a^5*d^8*g^3*n/(d*x
+ c)^3 - 24*A*b^8*c^2*d^3*f^3 - 24*B*b^8*c^2*d^3*f^3 + 48*A*a*b^7*c*d^4*f^3
 + 48*B*a*b^7*c*d^4*f^3 + 72*(b*x + a)*A*b^7*c^2*d^4*f^3/(d*x + c) + 72*(b*
x + a)*B*b^7*c^2*d^4*f^3/(d*x + c) - 24*A*a^2*b^6*d^5*f^3 - 24*B*a^2*b^6*d^
5*f^3 - 144*(b*x + a)*A*a*b^6*c*d^5*f^3/(d*x + c) - 144*(b*x + a)*B*a*b^6*c
*d^5*f^3/(d*x + c) - 72*(b*x + a)^2*A*b^6*c^2*d^5*f^3/(d*x + c)^2 - 72*(b*x
 + a)^2*B*b^6*c^2*d^5*f^3/(d*x + c)^2 + 72*(b*x + a)*A*a^2*b^5*d^6*f^3/(d*x
 + c) + 72*(b*x + a)*B*a^2*b^5*d^6*f^3/(d*x + c) + 144*(b*x + a)^2*A*a*b^5*
c*d^6*f^3/(d*x + c)^2 + 144*(b*x + a)^2*B*a*b^5*c*d^6*f^3/(d*x + c)^2 + 24*
(b*x + a)^3*A*b^5*c^2*d^6*f^3/(d*x + c)^3 + 24*(b*x + a)^3*B*b^5*c^2*d^6*f^
3/(d*x + c)^3 - 72*(b*x + a)^2*A*a^2*b^4*d^7*f^3/(d*x + c)^2 - 72*(b*x + a)
^2*B*a^2*b^4*d^7*f^3/(d*x + c)^2 - 48*(b*x + a)^3*A*a*b^4*c*d^7*f^3/(d*x +
c)^3 - 48*(b*x + a)^3*B*a*b^4*c*d^7*f^3/(d*x + c)^3 + 24*(b*x + a)^3*A*a^2*
b^3*d^8*f^3/(d*x + c)^3 + 24*(b*x + a)^3*B*a^2*b^3*d^8*f^3/(d*x + c)^3 + 36
*A*b^8*c^3*d^2*f^2*g + 36*B*b^8*c^3*d^2*f^2*g - 36*A*a*b^7*c^2*d^3*f^2*g -
36*B*a*b^7*c^2*d^3*f^2*g - 144*(b*x + a)*A*b^7*c^3*d^3*f^2*g/(d*x + c) - 14
4*(b*x + a)*B*b^7*c^3*d^3*f^2*g/(d*x + c) - 36*A*a^2*b^6*c*d^4*f^2*g - 36*B
*a^2*b^6*c*d^4*f^2*g + 216*(b*x + a)*A*a*b^6*c^2*d^4*f^2*g/(d*x + c) + 216*
(b*x + a)*B*a*b^6*c^2*d^4*f^2*g/(d*x + c) + 180*(b*x + a)^2*A*b^6*c^3*d^4*f
^2*g/(d*x + c)^2 + 180*(b*x + a)^2*B*b^6*c^3*d^4*f^2*g/(d*x + c)^2 + 36*A*a
^3*b^5*d^5*f^2*g + 36*B*a^3*b^5*d^5*f^2*g - 324*(b*x + a)^2*A*a*b^5*c^2*d^5
*f^2*g/(d*x + c)^2 - 324*(b*x + a)^2*B*a*b^5*c^2*d^5*f^2*g/(d*x + c)^2 - 72
*(b*x + a)^3*A*b^5*c^3*d^5*f^2*g/(d*x + c)^3 - 72*(b*x + a)^3*B*b^5*c^3*d^5
*f^2*g/(d*x + c)^3 - 72*(b*x + a)*A*a^3*b^4*d^6*f^2*g/(d*x + c) - 72*(b*x +
 a)*B*a^3*b^4*d^6*f^2*g/(d*x + c) + 108*(b*x + a)^2*A*a^2*b^4*c*d^6*f^2*g/(
d*x + c)^2 + 108*(b*x + a)^2*B*a^2*b^4*c*d^6*f^2*g/(d*x + c)^2 + 144*(b*x +
 a)^3*A*a*b^4*c^2*d^6*f^2*g/(d*x + c)^3 + 144*(b*x + a)^3*B*a*b^4*c^2*d^6*f
^2*g/(d*x + c)^3 + 36*(b*x + a)^2*A*a^3*b^3*d^7*f^2*g/(d*x + c)^2 + 36*(b*x
 + a)^2*B*a^3*b^3*d^7*f^2*g/(d*x + c)^2 - 72*(b*x + a)^3*A*a^2*b^3*c*d^7*f^
2*g/(d*x + c)^3 - 72*(b*x + a)^3*B*a^2*b^3*c*d^7*f^2*g/(d*x + c)^3 - 24*A*b
^8*c^4*d*f*g^2 - 24*B*b^8*c^4*d*f*g^2 + 24*A*a*b^7*c^3*d^2*f*g^2 + 24*B*a*b
^7*c^3*d^2*f*g^2 + 96*(b*x + a)*A*b^7*c^4*d^2*f*g^2/(d*x + c) + 96*(b*x + a
)*B*b^7*c^4*d^2*f*g^2/(d*x + c) - 96*(b*x + a)*A*a*b^6*c^3*d^3*f*g^2/(d*x +
 c) - 96*(b*x + a)*B*a*b^6*c^3*d^3*f*g^2/(d*x + c) - 144*(b*x + a)^2*A*b^6*
c^4*d^3*f*g^2/(d*x + c)^2 - 144*(b*x + a)^2*B*b^6*c^4*d^3*f*g^2/(d*x + c)^2
 + 24*A*a^3*b^5*c*d^4*f*g^2 + 24*B*a^3*b^5*c*d^4*f*g^2 - 72*(b*x + a)*A*a^2
*b^5*c^2*d^4*f*g^2/(d*x + c) - 72*(b*x + a)*B*a^2*b^5*c^2*d^4*f*g^2/(d*x +
c) + 216*(b*x + a)^2*A*a*b^5*c^3*d^4*f*g^2/(d*x + c)^2 + 216*(b*x + a)^2*B*
a*b^5*c^3*d^4*f*g^2/(d*x + c)^2 + 72*(b*x + a)^3*A*b^5*c^4*d^4*f*g^2/(d*x +
 c)^3 + 72*(b*x + a)^3*B*b^5*c^4*d^4*f*g^2/(d*x + c)^3 - 24*A*a^4*b^4*d^5*f
*g^2 - 24*B*a^4*b^4*d^5*f*g^2 + 48*(b*x + a)*A*a^3*b^4*c*d^5*f*g^2/(d*x + c
) + 48*(b*x + a)*B*a^3*b^4*c*d^5*f*g^2/(d*x + c) - 144*(b*x + a)^3*A*a*b^4*
c^3*d^5*f*g^2/(d*x + c)^3 - 144*(b*x + a)^3*B*a*b^4*c^3*d^5*f*g^2/(d*x + c)
^3 + 24*(b*x + a)*A*a^4*b^3*d^6*f*g^2/(d*x + c) + 24*(b*x + a)*B*a^4*b^3*d^
6*f*g^2/(d*x + c) - 72*(b*x + a)^2*A*a^3*b^3*c*d^6*f*g^2/(d*x + c)^2 - 72*(
b*x + a)^2*B*a^3*b^3*c*d^6*f*g^2/(d*x + c)^2 + 72*(b*x + a)^3*A*a^2*b^3*c^2
*d^6*f*g^2/(d*x + c)^3 + 72*(b*x + a)^3*B*a^2*b^3*c^2*d^6*f*g^2/(d*x + c)^3
 + 6*A*b^8*c^5*g^3 + 6*B*b^8*c^5*g^3 - 6*A*a*b^7*c^4*d*g^3 - 6*B*a*b^7*c^4*
d*g^3 - 24*(b*x + a)*A*b^7*c^5*d*g^3/(d*x + c) - 24*(b*x + a)*B*b^7*c^5*d*g
^3/(d*x + c) + 24*(b*x + a)*A*a*b^6*c^4*d^2*g^3/(d*x + c) + 24*(b*x + a)*B*
```

```
a*b^6*c^4*d^2*g^3/(d*x + c) + 36*(b*x + a)^2*A*b^6*c^5*d^2*g^3/(d*x + c)^2
+ 36*(b*x + a)^2*B*b^6*c^5*d^2*g^3/(d*x + c)^2 - 36*(b*x + a)^2*A*a*b^5*c^4
*d^3*g^3/(d*x + c)^2 - 36*(b*x + a)^2*B*a*b^5*c^4*d^3*g^3/(d*x + c)^2 - 24*
(b*x + a)^3*A*b^5*c^5*d^3*g^3/(d*x + c)^3 - 24*(b*x + a)^3*B*b^5*c^5*d^3*g^
3/(d*x + c)^3 - 6*A*a^4*b^4*c*d^4*g^3 - 6*B*a^4*b^4*c*d^4*g^3 + 24*(b*x + a
)*A*a^3*b^4*c^2*d^4*g^3/(d*x + c) + 24*(b*x + a)*B*a^3*b^4*c^2*d^4*g^3/(d*x
 + c) - 36*(b*x + a)^2*A*a^2*b^4*c^3*d^4*g^3/(d*x + c)^2 - 36*(b*x + a)^2*B
*a^2*b^4*c^3*d^4*g^3/(d*x + c)^2 + 48*(b*x + a)^3*A*a*b^4*c^4*d^4*g^3/(d*x
+ c)^3 + 48*(b*x + a)^3*B*a*b^4*c^4*d^4*g^3/(d*x + c)^3 + 6*A*a^5*b^3*d^5*g
^3 + 6*B*a^5*b^3*d^5*g^3 - 24*(b*x + a)*A*a^4*b^3*c*d^5*g^3/(d*x + c) - 24*
(b*x + a)*B*a^4*b^3*c*d^5*g^3/(d*x + c) + 36*(b*x + a)^2*A*a^3*b^3*c^2*d^5*
g^3/(d*x + c)^2 + 36*(b*x + a)^2*B*a^3*b^3*c^2*d^5*g^3/(d*x + c)^2 - 24*(b*
x + a)^3*A*a^2*b^3*c^3*d^5*g^3/(d*x + c)^3 - 24*(b*x + a)^3*B*a^2*b^3*c^3*d
^5*g^3/(d*x + c)^3)/(b^7*d^4 - 4*(b*x + a)*b^6*d^5/(d*x + c) + 6*(b*x + a)^
2*b^5*d^6/(d*x + c)^2 - 4*(b*x + a)^3*b^4*d^7/(d*x + c)^3 + (b*x + a)^4*b^3
*d^8/(d*x + c)^4) + 6*(4*B*b^5*c^2*d^3*f^3*n - 8*B*a*b^4*c*d^4*f^3*n + 4*B*
a^2*b^3*d^5*f^3*n - 6*B*b^5*c^3*d^2*f^2*g*n + 6*B*a*b^4*c^2*d^3*f^2*g*n + 6
*B*a^2*b^3*c*d^4*f^2*g*n - 6*B*a^3*b^2*d^5*f^2*g*n + 4*B*b^5*c^4*d*f*g^2*n
- 4*B*a*b^4*c^3*d^2*f*g^2*n - 4*B*a^3*b^2*c*d^4*f*g^2*n + 4*B*a^4*b*d^5*f*g
^2*n - B*b^5*c^5*g^3*n + B*a*b^4*c^4*d*g^3*n + B*a^4*b*c*d^4*g^3*n - B*a^5*
d^5*g^3*n)*log(-b + (b*x + a)*d/(d*x + c))/(b^4*d^4) - 6*(4*B*b^5*c^2*d^3*f
^3*n - 8*B*a*b^4*c*d^4*f^3*n + 4*B*a^2*b^3*d^5*f^3*n - 6*B*b^5*c^3*d^2*f^2*
g*n + 6*B*a*b^4*c^2*d^3*f^2*g*n + 6*B*a^2*b^3*c*d^4*f^2*g*n - 6*B*a^3*b^2*d
^5*f^2*g*n + 4*B*b^5*c^4*d*f*g^2*n - 4*B*a*b^4*c^3*d^2*f*g^2*n - 4*B*a^3*b^
2*c*d^4*f*g^2*n + 4*B*a^4*b*d^5*f*g^2*n - B*b^5*c^5*g^3*n + B*a*b^4*c^4*d*g
^3*n + B*a^4*b*c*d^4*g^3*n - B*a^5*d^5*g^3*n)*log((b*x + a)/(d*x + c))/(b^4
*d^4))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.26, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)^{3} \left(B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((g*x+f)^3*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.93, size = 443, normalized size = 1.89

$$\frac{1}{4}\,Bg^{3}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{4}\,Ag^{3}x^{4}+Bfg^{2}x^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Afg^{2}x^{3}+\frac{3}{2}\,Bf^{2}gx^{2}\log\Bigg(e\Bigg(\frac{b}{dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/4*B*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*g^3*x^4 + B*f*
g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f*g^2*x^3 + 3/2*B*f^2*g*
x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*f^2*g*x^2 - 1/24*B*g^3*n
*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d
^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3
)) + 1/2*B*f*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2
*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3/2*B*f^2*g*n*(
a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f^3*
n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*f^3*x*log(e*(b*x/(d*x + c) + a/
(d*x + c))^n) + A*f^3*x
```

mupad [B]   time = 4.74, size = 766, normalized size = 3.26

$$x\left(\frac{4\,A\,b\,d\,f^3+12\,A\,a\,c\,f\,g^2+12\,A\,a\,d\,f^2\,g+12\,A\,b\,c\,f^2\,g+6\,B\,a\,d\,f^2\,g\,n-6\,B\,b\,c\,f^2\,g\,n}{4\,b\,d}+\frac{(4\,a\,d+4\,b\,c)\left(\left(\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x*((4*A*b*d*f^3 + 12*A*a*c*f*g^2 + 12*A*a*d*f^2*g + 12*A*b*c*f^2*g + 6*B*a*
d*f^2*g*n - 6*B*b*c*f^2*g*n)/(4*b*d) + ((4*a*d + 4*b*c)*((((4*A*a*d*g^3 + 4
*A*b*c*g^3 + 12*A*b*d*f*g^2 + B*a*d*g^3*n - B*b*c*g^3*n)/(4*b*d) - (A*g^3*(
4*a*d + 4*b*c))/(4*b*d))*(4*a*d + 4*b*c))/(4*b*d) - (4*A*a*c*g^3 + 12*A*a*d
*f*g^2 + 12*A*b*c*f*g^2 + 12*A*b*d*f^2*g + 4*B*a*d*f*g^2*n - 4*B*b*c*f*g^2*
n)/(4*b*d) + (A*a*c*g^3)/(b*d)))/(4*b*d) - (a*c*((4*A*a*d*g^3 + 4*A*b*c*g^3
 + 12*A*b*d*f*g^2 + B*a*d*g^3*n - B*b*c*g^3*n)/(4*b*d) - (A*g^3*(4*a*d + 4*
b*c))/(4*b*d)))/(b*d)) - x^2*((((4*A*a*d*g^3 + 4*A*b*c*g^3 + 12*A*b*d*f*g^2
 + B*a*d*g^3*n - B*b*c*g^3*n)/(4*b*d) - (A*g^3*(4*a*d + 4*b*c))/(4*b*d))*(4
*a*d + 4*b*c))/(8*b*d) - (4*A*a*c*g^3 + 12*A*a*d*f*g^2 + 12*A*b*c*f*g^2 + 1
2*A*b*d*f^2*g + 4*B*a*d*f*g^2*n - 4*B*b*c*f*g^2*n)/(8*b*d) + (A*a*c*g^3)/(2
*b*d)) + x^3*((4*A*a*d*g^3 + 4*A*b*c*g^3 + 12*A*b*d*f*g^2 + B*a*d*g^3*n - B
*b*c*g^3*n)/(12*b*d) - (A*g^3*(4*a*d + 4*b*c))/(12*b*d)) + log(e*((a + b*x)
/(c + d*x))^n)*((B*g^3*x^4)/4 + B*f^3*x + (3*B*f^2*g*x^2)/2 + B*f*g^2*x^3)
+ (A*g^3*x^4)/4 - (log(a + b*x)*(B*a^4*g^3*n - 4*B*a*b^3*f^3*n - 4*B*a^3*b*
f*g^2*n + 6*B*a^2*b^2*f^2*g*n))/(4*b^4) + (log(c + d*x)*(B*c^4*g^3*n - 4*B*
c*d^3*f^3*n - 4*B*c^3*d*f*g^2*n + 6*B*c^2*d^2*f^2*g*n))/(4*d^4)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

3.59 $\int (f+gx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=157

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g}-\frac{Bn(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bgnx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{Bg^2nx^2(bc-}{6bd}$$

```
[Out] -1/3*B*(-a*d+b*c)*g*(-a*d*g-b*c*g+3*b*d*f)*n*x/b^2/d^2-1/6*B*(-a*d+b*c)*g^2
*n*x^2/b/d-1/3*B*(-a*g+b*f)^3*n*ln(b*x+a)/b^3/g+1/3*(g*x+f)^3*(A+B*ln(e*((b
*x+a)/(d*x+c))^n))/g+1/3*B*(-c*g+d*f)^3*n*ln(d*x+c)/d^3/g
```

Rubi **[A]** time = 0.18, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g}-\frac{Bgnx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{Bn(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2nx^2(bc-}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*g^2*n*x^2)/(6*b*d) - (B*(b*f - a*g)^3*n*Log[a + b*x])/(3*b^3*g) + ((f +
g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*g) + (B*(d*f - c*g)^3*n*L
og[c + d*x])/(3*d^3*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx=\frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g}-\frac{(Bn)\int\frac{(bc-ad)(f+gx)^3}{(a+bx)(c+dx)}dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g}-\frac{(B(bc-ad)n)\int\frac{(f+gx)^3}{(a+bx)(c+dx)}}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g}-\frac{(B(bc-ad)n)\int\left(\frac{g^2(3bdf-bcg-}{b^2d^2}\right.}{}$$

$$=-\frac{B(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2}-\frac{B(bc-ad)g^2nx^2}{6bd}-\frac{B(bf-}{}$$

Mathematica [**A**] time = 0.15, size = 146, normalized size = 0.93

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn\left(b^2d^2g^3x^2(bc-ad)+2bdg^2x(bc-ad)(-adg-bcg+3bdf)+2d^3(bf-ag)^3\log(a+bx)-2b^3(df-cg)^3\log\right.}{2b^3d^3}}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (B*n*(2*b*d*(b*c - a*
d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + b^2*d^2*(b*c - a*d)*g^3*x^2 + 2*d^3*(b
*f - a*g)^3*Log[a + b*x] - 2*b^3*(d*f - c*g)^3*Log[c + d*x]))/(2*b^3*d^3))/
(3*g)
```

fricas [**B**] time = 0.96, size = 334, normalized size = 2.13

$$\frac{2\,Ab^3d^3g^2x^3+\left(6\,Ab^3d^3fg-\left(Bb^3cd^2-Bab^2d^3\right)g^2n\right)x^2+2\left(3\,Bab^2d^3f^2-3\,Ba^2bd^3fg+Ba^3d^3g^2\right)n\log\left(bx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 + (6*A*b^3*d^3*f*g - (B*b^3*c*d^2 - B*a*b^2*d^3)*g
^2*n)*x^2 + 2*(3*B*a*b^2*d^3*f^2 - 3*B*a^2*b*d^3*f*g + B*a^3*d^3*g^2)*n*log
(b*x + a) - 2*(3*B*b^3*c*d^2*f^2 - 3*B*b^3*c^2*d*f*g + B*b^3*c^3*g^2)*n*log
(d*x + c) + 2*(3*A*b^3*d^3*f^2 - (3*(B*b^3*c*d^2 - B*a*b^2*d^3)*f*g - (B*b^
3*c^2*d - B*a^2*b*d^3)*g^2)*n)*x + 2*(B*b^3*d^3*g^2*x^3 + 3*B*b^3*d^3*f*g*x
^2 + 3*B*b^3*d^3*f^2*x)*log(e) + 2*(B*b^3*d^3*g^2*n*x^3 + 3*B*b^3*d^3*f*g*n
*x^2 + 3*B*b^3*d^3*f^2*n*x)*log((b*x + a)/(d*x + c)))/(b^3*d^3)
```

giac [**B**] time = 5.58, size = 3346, normalized size = 21.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/6*(2*(3*B*b^4*c^2*d^2*f^2*n - 6*B*a*b^3*c*d^3*f^2*n - 6*(b*x + a)*B*b^3*c
^2*d^3*f^2*n/(d*x + c) + 3*B*a^2*b^2*d^4*f^2*n + 12*(b*x + a)*B*a*b^2*c*d^4
*f^2*n/(d*x + c) + 3*(b*x + a)^2*B*b^2*c^2*d^4*f^2*n/(d*x + c)^2 - 6*(b*x +
```

```
 a)*B*a^2*b*d^5*f^2*n/(d*x + c) - 6*(b*x + a)^2*B*a*b*c*d^5*f^2*n/(d*x + c)
^2 + 3*(b*x + a)^2*B*a^2*d^6*f^2*n/(d*x + c)^2 - 3*B*b^4*c^3*d*f*g*n + 3*B*
a*b^3*c^2*d^2*f*g*n + 9*(b*x + a)*B*b^3*c^3*d^2*f*g*n/(d*x + c) + 3*B*a^2*b
^2*c*d^3*f*g*n - 15*(b*x + a)*B*a*b^2*c^2*d^3*f*g*n/(d*x + c) - 6*(b*x + a)
^2*B*b^2*c^3*d^3*f*g*n/(d*x + c)^2 - 3*B*a^3*b*d^4*f*g*n + 3*(b*x + a)*B*a^
2*b*c*d^4*f*g*n/(d*x + c) + 12*(b*x + a)^2*B*a*b*c^2*d^4*f*g*n/(d*x + c)^2
+ 3*(b*x + a)*B*a^3*d^5*f*g*n/(d*x + c) - 6*(b*x + a)^2*B*a^2*c*d^5*f*g*n/(
d*x + c)^2 + B*b^4*c^4*g^2*n - B*a*b^3*c^3*d*g^2*n - 3*(b*x + a)*B*b^3*c^4*
d*g^2*n/(d*x + c) + 3*(b*x + a)*B*a*b^2*c^3*d^2*g^2*n/(d*x + c) + 3*(b*x +
a)^2*B*b^2*c^4*d^2*g^2*n/(d*x + c)^2 - B*a^3*b*c*d^3*g^2*n + 3*(b*x + a)*B*
a^2*b*c^2*d^3*g^2*n/(d*x + c) - 6*(b*x + a)^2*B*a*b*c^3*d^3*g^2*n/(d*x + c)
^2 + B*a^4*d^4*g^2*n - 3*(b*x + a)*B*a^3*c*d^4*g^2*n/(d*x + c) + 3*(b*x + a
)^2*B*a^2*c^2*d^4*g^2*n/(d*x + c)^2)*log((b*x + a)/(d*x + c))/(b^3*d^3 - 3*
(b*x + a)*b^2*d^4/(d*x + c) + 3*(b*x + a)^2*b*d^5/(d*x + c)^2 - (b*x + a)^3
*d^6/(d*x + c)^3) - (6*B*b^6*c^3*d*f*g*n - 18*B*a*b^5*c^2*d^2*f*g*n - 12*(b
*x + a)*B*b^5*c^3*d^2*f*g*n/(d*x + c) + 18*B*a^2*b^4*c*d^3*f*g*n + 36*(b*x
+ a)*B*a*b^4*c^2*d^3*f*g*n/(d*x + c) + 6*(b*x + a)^2*B*b^4*c^3*d^3*f*g*n/(d
*x + c)^2 - 6*B*a^3*b^3*d^4*f*g*n - 36*(b*x + a)*B*a^2*b^3*c*d^4*f*g*n/(d*x
 + c) - 18*(b*x + a)^2*B*a*b^3*c^2*d^4*f*g*n/(d*x + c)^2 + 12*(b*x + a)*B*a
^3*b^2*d^5*f*g*n/(d*x + c) + 18*(b*x + a)^2*B*a^2*b^2*c*d^5*f*g*n/(d*x + c)
^2 - 6*(b*x + a)^2*B*a^3*b*d^6*f*g*n/(d*x + c)^2 - 3*B*b^6*c^4*g^2*n + 6*B*
a*b^5*c^3*d*g^2*n + 7*(b*x + a)*B*b^5*c^4*d*g^2*n/(d*x + c) - 16*(b*x + a)*
B*a*b^4*c^3*d^2*g^2*n/(d*x + c) - 4*(b*x + a)^2*B*b^4*c^4*d^2*g^2*n/(d*x +
c)^2 - 6*B*a^3*b^3*c*d^3*g^2*n + 6*(b*x + a)*B*a^2*b^3*c^2*d^3*g^2*n/(d*x +
 c) + 10*(b*x + a)^2*B*a*b^3*c^3*d^3*g^2*n/(d*x + c)^2 + 3*B*a^4*b^2*d^4*g^
2*n + 8*(b*x + a)*B*a^3*b^2*c*d^4*g^2*n/(d*x + c) - 6*(b*x + a)^2*B*a^2*b^2
*c^2*d^4*g^2*n/(d*x + c)^2 - 5*(b*x + a)*B*a^4*b*d^5*g^2*n/(d*x + c) - 2*(b
*x + a)^2*B*a^3*b*c*d^5*g^2*n/(d*x + c)^2 + 2*(b*x + a)^2*B*a^4*d^6*g^2*n/(
d*x + c)^2 - 6*A*b^6*c^2*d^2*f^2 - 6*B*b^6*c^2*d^2*f^2 + 12*A*a*b^5*c*d^3*f
^2 + 12*B*a*b^5*c*d^3*f^2 + 12*(b*x + a)*A*b^5*c^2*d^3*f^2/(d*x + c) + 12*(
b*x + a)*B*b^5*c^2*d^3*f^2/(d*x + c) - 6*A*a^2*b^4*d^4*f^2 - 6*B*a^2*b^4*d^
4*f^2 - 24*(b*x + a)*A*a*b^4*c*d^4*f^2/(d*x + c) - 24*(b*x + a)*B*a*b^4*c*d
^4*f^2/(d*x + c) - 6*(b*x + a)^2*A*b^4*c^2*d^4*f^2/(d*x + c)^2 - 6*(b*x + a
)^2*B*b^4*c^2*d^4*f^2/(d*x + c)^2 + 12*(b*x + a)*A*a^2*b^3*d^5*f^2/(d*x + c
) + 12*(b*x + a)*B*a^2*b^3*d^5*f^2/(d*x + c) + 12*(b*x + a)^2*A*a*b^3*c*d^5
*f^2/(d*x + c)^2 + 12*(b*x + a)^2*B*a*b^3*c*d^5*f^2/(d*x + c)^2 - 6*(b*x +
a)^2*A*a^2*b^2*d^6*f^2/(d*x + c)^2 - 6*(b*x + a)^2*B*a^2*b^2*d^6*f^2/(d*x +
 c)^2 + 6*A*b^6*c^3*d*f*g + 6*B*b^6*c^3*d*f*g - 6*A*a*b^5*c^2*d^2*f*g - 6*B
*a*b^5*c^2*d^2*f*g - 18*(b*x + a)*A*b^5*c^3*d^2*f*g/(d*x + c) - 18*(b*x + a
)*B*b^5*c^3*d^2*f*g/(d*x + c) - 6*A*a^2*b^4*c*d^3*f*g - 6*B*a^2*b^4*c*d^3*f
*g + 30*(b*x + a)*A*a*b^4*c^2*d^3*f*g/(d*x + c) + 30*(b*x + a)*B*a*b^4*c^2*
d^3*f*g/(d*x + c) + 12*(b*x + a)^2*A*b^4*c^3*d^3*f*g/(d*x + c)^2 + 12*(b*x
+ a)^2*B*b^4*c^3*d^3*f*g/(d*x + c)^2 + 6*A*a^3*b^3*d^4*f*g + 6*B*a^3*b^3*d^
4*f*g - 6*(b*x + a)*A*a^2*b^3*c*d^4*f*g/(d*x + c) - 6*(b*x + a)*B*a^2*b^3*c
*d^4*f*g/(d*x + c) - 24*(b*x + a)^2*A*a*b^3*c^2*d^4*f*g/(d*x + c)^2 - 24*(b
*x + a)^2*B*a*b^3*c^2*d^4*f*g/(d*x + c)^2 - 6*(b*x + a)*A*a^3*b^2*d^5*f*g/(
d*x + c) - 6*(b*x + a)*B*a^3*b^2*d^5*f*g/(d*x + c) + 12*(b*x + a)^2*A*a^2*b
^2*c*d^5*f*g/(d*x + c)^2 + 12*(b*x + a)^2*B*a^2*b^2*c*d^5*f*g/(d*x + c)^2 -
 2*A*b^6*c^4*g^2 - 2*B*b^6*c^4*g^2 + 2*A*a*b^5*c^3*d*g^2 + 2*B*a*b^5*c^3*d*
g^2 + 6*(b*x + a)*A*b^5*c^4*d*g^2/(d*x + c) + 6*(b*x + a)*B*b^5*c^4*d*g^2/(
d*x + c) - 6*(b*x + a)*A*a*b^4*c^3*d^2*g^2/(d*x + c) - 6*(b*x + a)*B*a*b^4*
c^3*d^2*g^2/(d*x + c) - 6*(b*x + a)^2*A*b^4*c^4*d^2*g^2/(d*x + c)^2 - 6*(b*
x + a)^2*B*b^4*c^4*d^2*g^2/(d*x + c)^2 + 2*A*a^3*b^3*c*d^3*g^2 + 2*B*a^3*b^
3*c*d^3*g^2 - 6*(b*x + a)*A*a^2*b^3*c^2*d^3*g^2/(d*x + c) - 6*(b*x + a)*B*a
^2*b^3*c^2*d^3*g^2/(d*x + c) + 12*(b*x + a)^2*A*a*b^3*c^3*d^3*g^2/(d*x + c)
^2 + 12*(b*x + a)^2*B*a*b^3*c^3*d^3*g^2/(d*x + c)^2 - 2*A*a^4*b^2*d^4*g^2 -
 2*B*a^4*b^2*d^4*g^2 + 6*(b*x + a)*A*a^3*b^2*c*d^4*g^2/(d*x + c) + 6*(b*x +
 a)*B*a^3*b^2*c*d^4*g^2/(d*x + c) - 6*(b*x + a)^2*A*a^2*b^2*c^2*d^4*g^2/(d*
x + c)^2 - 6*(b*x + a)^2*B*a^2*b^2*c^2*d^4*g^2/(d*x + c)^2)/(b^5*d^3 - 3*(b
```

```
*x + a)*b^4*d^4/(d*x + c) + 3*(b*x + a)^2*b^3*d^5/(d*x + c)^2 - (b*x + a)^3
*b^2*d^6/(d*x + c)^3) + 2*(3*B*b^4*c^2*d^2*f^2*n - 6*B*a*b^3*c*d^3*f^2*n +
3*B*a^2*b^2*d^4*f^2*n - 3*B*b^4*c^3*d*f*g*n + 3*B*a*b^3*c^2*d^2*f*g*n + 3*B
*a^2*b^2*c*d^3*f*g*n - 3*B*a^3*b*d^4*f*g*n + B*b^4*c^4*g^2*n - B*a*b^3*c^3*
d*g^2*n - B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log(b - (b*x + a)*d/(d*x +
 c))/(b^3*d^3) - 2*(3*B*b^4*c^2*d^2*f^2*n - 6*B*a*b^3*c*d^3*f^2*n + 3*B*a^2
*b^2*d^4*f^2*n - 3*B*b^4*c^3*d*f*g*n + 3*B*a*b^3*c^2*d^2*f*g*n + 3*B*a^2*b^
2*c*d^3*f*g*n - 3*B*a^3*b*d^4*f*g*n + B*b^4*c^4*g^2*n - B*a*b^3*c^3*d*g^2*n
 - B*a^3*b*c*d^3*g^2*n + B*a^4*d^4*g^2*n)*log((b*x + a)/(d*x + c))/(b^3*d^3
))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.27, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)^{2}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((g*x+f)^2*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.89, size = 282, normalized size = 1.80

$$\frac{1}{3}Bg^{2}x^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{3}Ag^{2}x^{3}+Bfgx^{2}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Afgx^{2}+\frac{1}{6}Bg^{2}n\left(\frac{2a^{3}\log(b}{b^{3}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/3*B*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*g^2*x^3 + B*f*
g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f*g*x^2 + 1/6*B*g^2*n*(2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*f*g*n*(a^2*log(b*x + a)/b^2 - c^2*lo
g(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f^2*n*(a*log(b*x + a)/b - c*log(d
*x + c)/d) + B*f^2*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f^2*x
```

mupad [B] time = 4.18, size = 371, normalized size = 2.36

$$x^{2}\left(\frac{3\,A\,a\,d\,g^{2}+3\,A\,b\,c\,g^{2}+6\,A\,b\,d\,f\,g+B\,a\,d\,g^{2}\,n-B\,b\,c\,g^{2}\,n}{6\,b\,d}-\frac{A\,g^{2}\,\left(3\,a\,d+3\,b\,c\right)}{6\,b\,d}\right)-x\left(\frac{\left(3\,a\,d+3\,b\,c\right)\,\left(\frac{3\,A\,a}{}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x^2*((3*A*a*d*g^2 + 3*A*b*c*g^2 + 6*A*b*d*f*g + B*a*d*g^2*n - B*b*c*g^2*n)/
(6*b*d) - (A*g^2*(3*a*d + 3*b*c))/(6*b*d)) - x*(((3*a*d + 3*b*c)*((3*A*a*d*
g^2 + 3*A*b*c*g^2 + 6*A*b*d*f*g + B*a*d*g^2*n - B*b*c*g^2*n)/(3*b*d) - (A*g
^2*(3*a*d + 3*b*c))/(3*b*d)))/(3*b*d) - (3*A*a*c*g^2 + 3*A*b*d*f^2 + 6*A*a*
d*f*g + 6*A*b*c*f*g + 3*B*a*d*f*g*n - 3*B*b*c*f*g*n)/(3*b*d) + (A*a*c*g^2)/
(b*d)) + log(e*((a + b*x)/(c + d*x))^n)*((B*g^2*x^3)/3 + B*f^2*x + B*f*g*x^
2) + (A*g^2*x^3)/3 + (log(a + b*x)*(B*a^3*g^2*n + 3*B*a*b^2*f^2*n - 3*B*a^2
*b*f*g*n))/(3*b^3) - (log(c + d*x)*(B*c^3*g^2*n + 3*B*c*d^2*f^2*n - 3*B*c^2
*d*f*g*n))/(3*d^3)
```

sympy [A] time = 70.52, size = 1027, normalized size = 6.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Piecewise(((A + B*log(e*(a/c)**n))*(f**2*x + f*g*x**2 + g**2*x**3/3), Eq(b,
 0) & Eq(d, 0)), (A*f**2*x + A*f*g*x**2 + A*g**2*x**3/3 + B*a**3*g**2*n*log
(a/c + b*x/c)/(3*b**3) - B*a**2*f*g*n*log(a/c + b*x/c)/b**2 - B*a**2*g**2*n
*x/(3*b**2) + B*a*f**2*n*log(a/c + b*x/c)/b + B*a*f*g*n*x/b + B*a*g**2*n*x*
*2/(6*b) + B*f**2*n*x*log(a/c + b*x/c) - B*f**2*n*x + B*f**2*x*log(e) + B*f
*g*n*x**2*log(a/c + b*x/c) - B*f*g*n*x**2/2 + B*f*g*x**2*log(e) + B*g**2*n*
x**3*log(a/c + b*x/c)/3 - B*g**2*n*x**3/9 + B*g**2*x**3*log(e)/3, Eq(d, 0))
, (A*f**2*x + A*f*g*x**2 + A*g**2*x**3/3 - B*c**3*g**2*n*log(c + d*x)/(3*d*
*3) + B*c**2*f*g*n*log(c + d*x)/d**2 + B*c**2*g**2*n*x/(3*d**2) - B*c*f**2*
n*log(c + d*x)/d - B*c*f*g*n*x/d - B*c*g**2*n*x**2/(6*d) + B*f**2*n*x*log(a
) - B*f**2*n*x*log(c + d*x) + B*f**2*n*x + B*f**2*x*log(e) + B*f*g*n*x**2*l
og(a) - B*f*g*n*x**2*log(c + d*x) + B*f*g*n*x**2/2 + B*f*g*x**2*log(e) + B*
g**2*n*x**3*log(a)/3 - B*g**2*n*x**3*log(c + d*x)/3 + B*g**2*n*x**3/9 + B*g
**2*x**3*log(e)/3, Eq(b, 0)), (A*f**2*x + A*f*g*x**2 + A*g**2*x**3/3 + B*a*
*3*g**2*n*log(a/(c + d*x) + b*x/(c + d*x))/(3*b**3) + B*a**3*g**2*n*log(c/d
 + x)/(3*b**3) - B*a**2*f*g*n*log(a/(c + d*x) + b*x/(c + d*x))/b**2 - B*a**
2*f*g*n*log(c/d + x)/b**2 - B*a**2*g**2*n*x/(3*b**2) + B*a*f**2*n*log(a/(c
+ d*x) + b*x/(c + d*x))/b + B*a*f**2*n*log(c/d + x)/b + B*a*f*g*n*x/b + B*a
*g**2*n*x**2/(6*b) - B*c**3*g**2*n*log(c/d + x)/(3*d**3) + B*c**2*f*g*n*log
(c/d + x)/d**2 + B*c**2*g**2*n*x/(3*d**2) - B*c*f**2*n*log(c/d + x)/d - B*c
*f*g*n*x/d - B*c*g**2*n*x**2/(6*d) + B*f**2*n*x*log(a/(c + d*x) + b*x/(c +
d*x)) + B*f**2*x*log(e) + B*f*g*n*x**2*log(a/(c + d*x) + b*x/(c + d*x)) + B
*f*g*x**2*log(e) + B*g**2*n*x**3*log(a/(c + d*x) + b*x/(c + d*x))/3 + B*g**
2*x**3*log(e)/3, True))
```

3.60 $\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=115

$$\frac{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g}-\frac{Bn(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgnx(bc-ad)}{2bd}+\frac{Bn(df-cg)^2\log(c+dx)}{2d^2g}$$

```
[Out] -1/2*B*(-a*d+b*c)*g*n*x/b/d-1/2*B*(-a*g+b*f)^2*n*ln(b*x+a)/b^2/g+1/2*(g*x+f
)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/g+1/2*B*(-c*g+d*f)^2*n*ln(d*x+c)/d^2/g
```

Rubi [A] time = 0.10, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = $\{2525, 12, 72\}$

$$\frac{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g}-\frac{Bn(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgnx(bc-ad)}{2bd}+\frac{Bn(df-cg)^2\log(c+dx)}{2d^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*g*n*x)/(2*b*d) - (B*(b*f - a*g)^2*n*Log[a + b*x])/(2*b^2*g)
 + ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*g) + (B*(d*f - c
*g)^2*n*Log[c + d*x])/(2*d^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx &= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2g}-\frac{(Bn)\int\frac{(bc-ad)(f+gx)^2}{(a+bx)(c+dx)}\,dx}{2g}\\
&= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2g}-\frac{(B(bc-ad)n)\int\frac{(f+gx)^2}{(a+bx)(c+dx)}\,dx}{2g}\\
&= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2g}-\frac{(B(bc-ad)n)\int\Bigl(\frac{g^2}{bd}+\frac{(bf-ag)^2}{b(bc-ad)(a+}}{2g}\\
&= -\frac{B(bc-ad)gnx}{2bd}-\frac{B(bf-ag)^2n\log(a+bx)}{2b^2g}+\frac{(f+gx)^2\Bigl(A+B\log}{2g}
\end{aligned}
$$

Mathematica [**A**] time = 0.13, size = 120, normalized size = 1.04

$$
\frac{b\Bigl(d\left(Bg^2nx(ad-bc)+Abd(f+gx)^2\right)+bBd^2(f+gx)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+bBn(df-cg)^2\log(c+dx)\Bigr)-Bd^2n(bf}{2b^2d^2g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (-(B*d^2*(b*f - a*g)^2*n*Log[a + b*x]) + b*(d*(B*(-(b*c) + a*d)*g^2*n*x + A
*b*d*(f + g*x)^2) + b*B*d^2*(f + g*x)^2*Log[e*((a + b*x)/(c + d*x))^n] + b*
B*(d*f - c*g)^2*n*Log[c + d*x]))/(2*b^2*d^2*g)
```

fricas [**A**] time = 1.17, size = 179, normalized size = 1.56

$$
\frac{Ab^2d^2gx^2+\left(2\,Babd^2f-Ba^2d^2g\right)n\log\left(bx+a\right)-\left(2\,Bb^2cdf-Bb^2c^2g\right)n\log\left(dx+c\right)+\Bigl(2\,Ab^2d^2f-\Bigl(Bb^2cd-Ba}{2\,b^2d^2}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + (2*B*a*b*d^2*f - B*a^2*d^2*g)*n*log(b*x + a) - (2*B*
b^2*c*d*f - B*b^2*c^2*g)*n*log(d*x + c) + (2*A*b^2*d^2*f - (B*b^2*c*d - B*a
*b*d^2)*g*n)*x + (B*b^2*d^2*g*x^2 + 2*B*b^2*d^2*f*x)*log(e) + (B*b^2*d^2*g*
n*x^2 + 2*B*b^2*d^2*f*n*x)*log((b*x + a)/(d*x + c)))/(b^2*d^2)
```

giac [**B**] time = 2.37, size = 1189, normalized size = 10.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/2*((2*B*b^3*c^2*d*f*n - 4*B*a*b^2*c*d^2*f*n - 2*(b*x + a)*B*b^2*c^2*d^2*f
*n/(d*x + c) + 2*B*a^2*b*d^3*f*n + 4*(b*x + a)*B*a*b*c*d^3*f*n/(d*x + c) -
2*(b*x + a)*B*a^2*d^4*f*n/(d*x + c) - B*b^3*c^3*g*n + B*a*b^2*c^2*d*g*n + 2
*(b*x + a)*B*b^2*c^3*d*g*n/(d*x + c) + B*a^2*b*c*d^2*g*n - 4*(b*x + a)*B*a*
b*c^2*d^2*g*n/(d*x + c) - B*a^3*d^3*g*n + 2*(b*x + a)*B*a^2*c*d^3*g*n/(d*x
+ c))*log((b*x + a)/(d*x + c))/(b^2*d^2 - 2*(b*x + a)*b*d^3/(d*x + c) + (b*
x + a)^2*d^4/(d*x + c)^2) - (B*b^4*c^3*g*n - 3*B*a*b^3*c^2*d*g*n - (b*x + a
```

```
)*B*b^3*c^3*d*g*n/(d*x + c) + 3*B*a^2*b^2*c*d^2*g*n + 3*(b*x + a)*B*a*b^2*c
^2*d^2*g*n/(d*x + c) - B*a^3*b*d^3*g*n - 3*(b*x + a)*B*a^2*b*c*d^3*g*n/(d*x
 + c) + (b*x + a)*B*a^3*d^4*g*n/(d*x + c) - 2*A*b^4*c^2*d*f - 2*B*b^4*c^2*d
*f + 4*A*a*b^3*c*d^2*f + 4*B*a*b^3*c*d^2*f + 2*(b*x + a)*A*b^3*c^2*d^2*f/(d
*x + c) + 2*(b*x + a)*B*b^3*c^2*d^2*f/(d*x + c) - 2*A*a^2*b^2*d^3*f - 2*B*a
^2*b^2*d^3*f - 4*(b*x + a)*A*a*b^2*c*d^3*f/(d*x + c) - 4*(b*x + a)*B*a*b^2*
c*d^3*f/(d*x + c) + 2*(b*x + a)*A*a^2*b*d^4*f/(d*x + c) + 2*(b*x + a)*B*a^2
*b*d^4*f/(d*x + c) + A*b^4*c^3*g + B*b^4*c^3*g - A*a*b^3*c^2*d*g - B*a*b^3*
c^2*d*g - 2*(b*x + a)*A*b^3*c^3*d*g/(d*x + c) - 2*(b*x + a)*B*b^3*c^3*d*g/(
d*x + c) - A*a^2*b^2*c*d^2*g - B*a^2*b^2*c*d^2*g + 4*(b*x + a)*A*a*b^2*c^2*
d^2*g/(d*x + c) + 4*(b*x + a)*B*a*b^2*c^2*d^2*g/(d*x + c) + A*a^3*b*d^3*g +
 B*a^3*b*d^3*g - 2*(b*x + a)*A*a^2*b*c*d^3*g/(d*x + c) - 2*(b*x + a)*B*a^2*
b*c*d^3*g/(d*x + c))/(b^3*d^2 - 2*(b*x + a)*b^2*d^3/(d*x + c) + (b*x + a)^2
*b*d^4/(d*x + c)^2) + (2*B*b^3*c^2*d*f*n - 4*B*a*b^2*c*d^2*f*n + 2*B*a^2*b*
d^3*f*n - B*b^3*c^3*g*n + B*a*b^2*c^2*d*g*n + B*a^2*b*c*d^2*g*n - B*a^3*d^3
*g*n)*log(-b + (b*x + a)*d/(d*x + c))/(b^2*d^2) - (2*B*b^3*c^2*d*f*n - 4*B*
a*b^2*c*d^2*f*n + 2*B*a^2*b*d^3*f*n - B*b^3*c^3*g*n + B*a*b^2*c^2*d*g*n + B
*a^2*b*c*d^2*g*n - B*a^3*d^3*g*n)*log((b*x + a)/(d*x + c))/(b^2*d^2))*(b*c/
(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.18, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((g*x+f)*(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.76, size = 150, normalized size = 1.30

$$\frac{1}{2}\,Bgx^{2}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{2}\,Agx^{2}-\frac{1}{2}\,Bgn\left(\frac{a^{2}\log\left(bx+a\right)}{b^{2}}-\frac{c^{2}\log\left(dx+c\right)}{d^{2}}+\frac{(bc-ad)x}{bd}\right)+Bfn\Bigg(a\,lo$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/2*B*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*g*x^2 - 1/2*B*g*
n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f
*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*f*x*log(e*(b*x/(d*x + c) + a/(
d*x + c))^n) + A*f*x
```

mupad [B] time = 4.26, size = 153, normalized size = 1.33

$$x\left(\frac{2\,A\,a\,d\,g+2\,A\,b\,c\,g+2\,A\,b\,d\,f+B\,a\,d\,g\,n-B\,b\,c\,g\,n}{2\,b\,d}-\frac{A\,g\,\left(2\,a\,d+2\,b\,c\right)}{2\,b\,d}\right)+\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^{n}\right)\,\left(\frac{B\,g\,x^{2}}{2}+B$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] x*((2*A*a*d*g + 2*A*b*c*g + 2*A*b*d*f + B*a*d*g*n - B*b*c*g*n)/(2*b*d) - (A
*g*(2*a*d + 2*b*c))/(2*b*d)) + log(e*((a + b*x)/(c + d*x))^n)*(B*f*x + (B*g
*x^2)/2) - (log(a + b*x)*(B*a^2*g*n - 2*B*a*b*f*n))/(2*b^2) + (log(c + d*x)
*(B*c^2*g*n - 2*B*c*d*f*n))/(2*d^2) + (A*g*x^2)/2
```

sympy [A] time = 44.18, size = 551, normalized size = 4.79

$$\begin{cases} \left(A + B\log\left(e\left(\frac{a}{c}\right)^{n}\right)\right)\left(fx + \frac{gx^2}{2}\right) \\ Afx + \frac{Agx^2}{2} + \frac{Bc^2gn\log(c+dx)}{2d^2} - \frac{Bcfn\log(c+dx)}{d} - \frac{Bcgnx}{2d} + Bfnx\log(a) - Bfnx\log(c+dx) + Bfnx + Bfx\log(e) + \\ Afx + \frac{Agx^2}{2} - \frac{Ba^2gn\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{2b^2} + \frac{Bafn\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{b} + \frac{Bagnx}{2b} + Bfnx\log\left(\frac{a}{c}+\frac{bx}{c}\right) - Bfnx + Bfx\log(e) + \\ Afx + \frac{Agx^2}{2} - \frac{Ba^2gn\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{2b^2} - \frac{Ba^2gn\log\left(\frac{c}{d}+x\right)}{2b^2} + \frac{Bafn\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{b} + \frac{Bafn\log\left(\frac{c}{d}+x\right)}{b} + \frac{Bagnx}{2b} + \frac{Bc^2gn\log\left(\frac{c}{d}+x\right)}{2d^2} - \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Piecewise(((A + B*log(e*(a/c)**n))*(f*x + g*x**2/2), Eq(b, 0) & Eq(d, 0)),
(A*f*x + A*g*x**2/2 + B*c**2*g*n*log(c + d*x)/(2*d**2) - B*c*f*n*log(c + d*
x)/d - B*c*g*n*x/(2*d) + B*f*n*x*log(a) - B*f*n*x*log(c + d*x) + B*f*n*x +
B*f*x*log(e) + B*g*n*x**2*log(a)/2 - B*g*n*x**2*log(c + d*x)/2 + B*g*n*x**2
/4 + B*g*x**2*log(e)/2, Eq(b, 0)), (A*f*x + A*g*x**2/2 - B*a**2*g*n*log(a/c
 + b*x/c)/(2*b**2) + B*a*f*n*log(a/c + b*x/c)/b + B*a*g*n*x/(2*b) + B*f*n*x
*log(a/c + b*x/c) - B*f*n*x + B*f*x*log(e) + B*g*n*x**2*log(a/c + b*x/c)/2
- B*g*n*x**2/4 + B*g*x**2*log(e)/2, Eq(d, 0)), (A*f*x + A*g*x**2/2 - B*a**2
*g*n*log(a/(c + d*x) + b*x/(c + d*x))/(2*b**2) - B*a**2*g*n*log(c/d + x)/(2
*b**2) + B*a*f*n*log(a/(c + d*x) + b*x/(c + d*x))/b + B*a*f*n*log(c/d + x)/
b + B*a*g*n*x/(2*b) + B*c**2*g*n*log(c/d + x)/(2*d**2) - B*c*f*n*log(c/d +
x)/d - B*c*g*n*x/(2*d) + B*f*n*x*log(a/(c + d*x) + b*x/(c + d*x)) + B*f*x*l
og(e) + B*g*n*x**2*log(a/(c + d*x) + b*x/(c + d*x))/2 + B*g*x**2*log(e)/2,
True))
```

3.61 $\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=56

$$\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x+B*(b*x+a)*ln(e*((b*x+a)/(d*x+c))^n)/b-B*(-a*d+b*c)*n*ln(d*x+c)/b/d
```

Rubi [A] time = 0.03, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[e*((a + b*x)/(c + d*x))^n],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b - (B*(b*c - a*d)*n*Log
[c + d*x])/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rubi steps

$$\begin{aligned}\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx&=Ax+B\int \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)dx\\&=Ax+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{(B(bc-ad)n)\int \frac{1}{c+dx}\,dx}{b}\\&=Ax+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{B(bc-ad)n\log(c+dx)}{bd}\end{aligned}$$

Mathematica [A] time = 0.01, size = 56, normalized size = 1.00

$$\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[e*((a + b*x)/(c + d*x))^n],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b - (B*(b*c - a*d)*n*Log
[c + d*x])/(b*d)
```

fricas [A] time = 0.92, size = 63, normalized size = 1.12

$$\frac{Bbdnx\log\left(\frac{bx+a}{dx+c}\right) + Badn\log(bx+a) - Bbcn\log(dx+c) + Bbdx\log(e) + Abdx}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas")
```

```
[Out] (B*b*d*n*x*log((b*x + a)/(d*x + c)) + B*a*d*n*log(b*x + a) - B*b*c*n*log(d*
x + c) + B*b*d*x*log(e) + A*b*d*x)/(b*d)
```

giac [B] time = 0.94, size = 237, normalized size = 4.23

$$B\left(\frac{\left(b^2c^2n - 2\,abcdn + a^2d^2n\right)\log\left(\frac{bx+a}{dx+c}\right)}{bd - \frac{(bx+a)d^2}{dx+c}} + \frac{b^2c^2 - 2\,abcd + a^2d^2}{bd - \frac{(bx+a)d^2}{dx+c}} + \frac{\left(b^2c^2n - 2\,abcdn + a^2d^2n\right)\log\left(b - \frac{(bx+a)d}{dx+c}\right)}{bd} - \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] B*((b^2*c^2*n - 2*a*b*c*d*n + a^2*d^2*n)*log((b*x + a)/(d*x + c))/(b*d - (b
*x + a)*d^2/(d*x + c)) + (b^2*c^2 - 2*a*b*c*d + a^2*d^2)/(b*d - (b*x + a)*d
^2/(d*x + c)) + (b^2*c^2*n - 2*a*b*c*d*n + a^2*d^2*n)*log(b - (b*x + a)*d/(
d*x + c))/(b*d) - (b^2*c^2*n - 2*a*b*c*d*n + a^2*d^2*n)*log((b*x + a)/(d*x
+ c))/(b*d))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2) + A*x
```

maple [B] time = 0.05, size = 122, normalized size = 2.18

$$\frac{B\,a^2dn\ln(bx+a)}{(ad-bc)\,b} - \frac{Bacn\ln(bx+a)}{ad-bc} - \frac{Bacn\ln(dx+c)}{ad-bc} + \frac{Bb\,c^2n\ln(dx+c)}{(ad-bc)\,d} + Bx\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(B*ln(e*((b*x+a)/(d*x+c))^n)+A,x)
```

```
[Out] A*x+B*x*ln(e*((b*x+a)/(d*x+c))^n)-B*n*c/(a*d-b*c)*ln(d*x+c)*a+B*n*c^2/(a*d-
b*c)/d*ln(d*x+c)*b+B*n*a^2/(a*d-b*c)/b*ln(b*x+a)*d-B*n*a/(a*d-b*c)*ln(b*x+a
)*c
```

maxima [A] time = 0.63, size = 52, normalized size = 0.93

$$Bn\left(\frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right) + Bx\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima")
```

```
[Out] B*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*x*log(e*((b*x + a)/(d*x + c))
^n) + A*x
```

mupad [B] time = 4.01, size = 52, normalized size = 0.93

$$A\,x + B\,x\,\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right) + \frac{B\,a\,n\,\ln(a+b\,x)}{b} - \frac{B\,c\,n\,\ln(c+d\,x)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A + B*log(e*((a + b*x)/(c + d*x))^n),x)
```

```
[Out] A*x + B*x*log(e*((a + b*x)/(c + d*x))^n) + (B*a*n*log(a + b*x))/b - (B*c*n*
log(c + d*x))/d
```

sympy **[A]** time = 5.41, size = 158, normalized size = 2.82

$$Ax+B\left(\begin{cases} x\log\left(e\left(\frac{a}{c}\right)^{n}\right) & \text{for}\ b=0\wedge d=0\\ -\frac{cn\log(c+dx)}{d}+nx\log(a)-nx\log(c+dx)+nx+x\log(e) & \text{for}\ b=0\\ \frac{an\log\left(\frac{a}{c}+\frac{bx}{c}\right)}{b}+nx\log\left(\frac{a}{c}+\frac{bx}{c}\right)-nx+x\log(e) & \text{for}\ d=0\\ \frac{an\log(c+dx)}{b}+\frac{an\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)}{b}-\frac{cn\log(c+dx)}{d}+nx\log\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)+x\log(e) & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] A*x + B*Piecewise((x*log(e*(a/c)**n), Eq(b, 0) & Eq(d, 0)), (-c*n*log(c + d
*x)/d + n*x*log(a) - n*x*log(c + d*x) + n*x + x*log(e), Eq(b, 0)), (a*n*log
(a/c + b*x/c)/b + n*x*log(a/c + b*x/c) - n*x + x*log(e), Eq(d, 0)), (a*n*lo
g(c + d*x)/b + a*n*log(a/(c + d*x) + b*x/(c + d*x))/b - c*n*log(c + d*x)/d
+ n*x*log(a/(c + d*x) + b*x/(c + d*x)) + x*log(e), True))
```

3.62 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{f+gx}\,dx$

Optimal. Leaf size=147

$$\frac{\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}-\frac{Bn\text{Li}_2\left(\frac{b(f+gx)}{bf-ag}\right)}{g}-\frac{Bn\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}+\frac{Bn\text{Li}_2\left(\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{Bn\log(}{}$$

```
[Out] -B*n*ln(-g*(b*x+a)/(-a*g+b*f))*ln(g*x+f)/g+(A+B*ln(e*((b*x+a)/(d*x+c))^n))*
ln(g*x+f)/g+B*n*ln(-g*(d*x+c)/(-c*g+d*f))*ln(g*x+f)/g-B*n*polylog(2,b*(g*x+
f)/(-a*g+b*f))/g+B*n*polylog(2,d*(g*x+f)/(-c*g+d*f))/g
```

Rubi **[A]** time = 0.23, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2524, 2418, 2394, 2393, 2391}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{Bn\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}-\frac{Bn\log(f+gx)\log\left(-\right.}{g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x),x]
```

```
[Out] -((B*n*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g) + ((A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[f + g*x])/g + (B*n*Log[-((g*(c + d*x))/(d*f -
c*g))]*Log[f + g*x])/g - (B*n*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (B
*n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{f+gx}\,dx &= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} - \frac{(Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\log(f+gx)}{a+bx}\,dx}{g} \\
&= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} - \frac{(Bn)\int \left(\frac{b\log(f+gx)}{a+bx}-\frac{d\log(f+gx)}{c+dx}\right)dx}{g} \\
&= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} - \frac{(bBn)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} + \frac{(Bdn)\int \frac{\log(f+gx)}{c+dx}}{g} \\
&= -\frac{Bn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} + Bn\,\mathrm{lo} \\
&= -\frac{Bn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} + Bn\,\mathrm{lo} \\
&= -\frac{Bn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} + Bn\,\mathrm{lo}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 122, normalized size = 0.83

$$\frac{\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-Bn\log\left(\frac{g(a+bx)}{ag-bf}\right)+A+Bn\log\left(\frac{g(c+dx)}{cg-df}\right)\right)-Bn\mathrm{Li}_2\left(\frac{b(f+gx)}{bf-ag}\right)+Bn\mathrm{Li}_2\left(\frac{d(f+gx)}{df-cg}\right)}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x),x]
```

```
[Out] ((A - B*n*Log[(g*(a + b*x))/(-(b*f) + a*g)] + B*Log[e*((a + b*x)/(c + d*x))
^n] + B*n*Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] - B*n*PolyLog[2,
(b*(f + g*x))/(b*f - a*g)] + B*n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

fricas [F] time = 1.00, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(g*x + f), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f),x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-B\int -\frac{\log\left((bx+a)^{n}\right)-\log\left((dx+c)^{n}\right)+\log(e)}{gx+f}\,dx+\frac{A\log\left(gx+f\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(g*x + f), x)
+ A*log(g*x + f)/g
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^{n}\right)}{f+g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(f + g*x),x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(f + g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}{f+gx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f),x)
```

```
[Out] Integral((A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))/(f + g*x), x)
```

3.63 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^2}\,dx$

Optimal. Leaf size=91

$$\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{(f+gx)(bf-ag)}+\frac{Bn(bc-ad)\log\left(\frac{f+gx}{c+dx}\right)}{(bf-ag)(df-cg)}$$

```
[Out] (b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*g+b*f)/(g*x+f)+B*(-a*d+b*c)*n*l
n((g*x+f)/(d*x+c))/(-a*g+b*f)/(-c*g+d*f)
```

Rubi [A] time = 0.12, antiderivative size = 119, normalized size of antiderivative = 1.31, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{g(f+gx)}+\frac{Bn(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}+\frac{bBn\log(a+bx)}{g(bf-ag)}-\frac{Bdn\log(c+dx)}{g(df-cg)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^2,x]
```

```
[Out] (b*B*n*Log[a + b*x])/(g*(b*f - a*g)) - (A + B*Log[e*((a + b*x)/(c + d*x))^n
])/(g*(f + g*x)) - (B*d*n*Log[c + d*x])/(g*(d*f - c*g)) + (B*(b*c - a*d)*n*
Log[f + g*x])/((b*f - a*g)*(d*f - c*g))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^2}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)}+\frac{(Bn)\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)}\,dx}{g}\\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)(f+gx)}\,dx}{g}\\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)}+\frac{(B(bc-ad)n)\int\left(\frac{b^2}{(bc-ad)(bf-ag)(a+bx)}+\frac{d^2}{(bc-ad)(-df+cg)(c+dx)}\right.}{g}\\ &= \frac{bBn\log(a+bx)}{g(bf-ag)}-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)}-\frac{Bdn\log(c+dx)}{g(df-cg)}+\frac{B(bc-ad)n\log(f}{(bf-ag)(df-}\end{aligned}$$

Mathematica [**A**] time = 0.15, size = 109, normalized size = 1.20

$$\frac{\frac{Bn(b\log(a+bx)(df-cg)+\log(c+dx)(adg-bdf)+g(bc-ad)\log(f+gx))}{(bf-ag)(df-cg)}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{f+gx}}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)) + (B*n*(b*(d*f - c*g)*
Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]
))/((b*f - a*g)*(d*f - c*g)))/g
```

fricas [**B**] time = 11.25, size = 294, normalized size = 3.23

$$-\frac{Abdf^2+Aacg^2-(Abc+Aad)fg+\left(Bbdf^2+Bacg^2-(Bbc+Bad)fg\right)n\log\left(\frac{bx+a}{dx+c}\right)-\left(\left(Bbdfg-Bbcg^2\right)nx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] -(A*b*d*f^2 + A*a*c*g^2 - (A*b*c + A*a*d)*f*g + (B*b*d*f^2 + B*a*c*g^2 - (B
*b*c + B*a*d)*f*g)*n*log((b*x + a)/(d*x + c)) - ((B*b*d*f*g - B*b*c*g^2)*n*
x + (B*b*d*f^2 - B*b*c*f*g)*n)*log(b*x + a) + ((B*b*d*f*g - B*a*d*g^2)*n*x
+ (B*b*d*f^2 - B*a*d*f*g)*n)*log(d*x + c) - ((B*b*c - B*a*d)*g^2*n*x + (B*b
*c - B*a*d)*f*g*n)*log(g*x + f) + (B*b*d*f^2 + B*a*c*g^2 - (B*b*c + B*a*d)*
f*g)*log(e))/(b*d*f^3*g + a*c*f*g^3 - (b*c + a*d)*f^2*g^2 + (b*d*f^2*g^2 +
a*c*g^4 - (b*c + a*d)*f*g^3)*x)
```

giac [**B**] time = 4.10, size = 455, normalized size = 5.00

$$\left(\frac{\left(Bb^2c^2n-2\,Babcdn+Ba^2d^2n\right)\log\left(-bf+\frac{(bx+a)df}{dx+c}+ag-\frac{(bx+a)cg}{dx+c}\right)}{bdf^2-bcfg-adfg+acg^2}+\frac{\left(Bb^2c^2n-2\,Babcdn+Ba^2d^2n\right.}{bdf^2-\frac{(bx+a)d^2f^2}{dx+c}-bcfg-adfg+\frac{2\,(bx+a)}{dx+c}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] ((B*b^2*c^2*n - 2*B*a*b*c*d*n + B*a^2*d^2*n)*log(-b*f + (b*x + a)*d*f/(d*x
+ c) + a*g - (b*x + a)*c*g/(d*x + c))/(b*d*f^2 - b*c*f*g - a*d*f*g + a*c*g^
2) + (B*b^2*c^2*n - 2*B*a*b*c*d*n + B*a^2*d^2*n)*log((b*x + a)/(d*x + c))/(
b*d*f^2 - (b*x + a)*d^2*f^2/(d*x + c) - b*c*f*g - a*d*f*g + 2*(b*x + a)*c*d
*f*g/(d*x + c) + a*c*g^2 - (b*x + a)*c^2*g^2/(d*x + c)) - (B*b^2*c^2*n - 2*
B*a*b*c*d*n + B*a^2*d^2*n)*log((b*x + a)/(d*x + c))/(b*d*f^2 - b*c*f*g - a*
d*f*g + a*c*g^2) + (A*b^2*c^2 + B*b^2*c^2 - 2*A*a*b*c*d - 2*B*a*b*c*d + A*a
^2*d^2 + B*a^2*d^2)/(b*d*f^2 - (b*x + a)*d^2*f^2/(d*x + c) - b*c*f*g - a*d*
f*g + 2*(b*x + a)*c*d*f*g/(d*x + c) + a*c*g^2 - (b*x + a)*c^2*g^2/(d*x + c)
))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{\left(gx+f\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^2,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^2,x)
```

maxima [A] time = 0.81, size = 142, normalized size = 1.56

$$Bn\left(\frac{b\log\left(bx+a\right)}{bfg-ag^{2}}-\frac{d\log\left(dx+c\right)}{dfg-cg^{2}}+\frac{\left(bc-ad\right)\log\left(gx+f\right)}{bdf^{2}+acg^{2}-\left(bc+ad\right)fg}\right)-\frac{B\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)}{g^{2}x+fg}-\frac{A}{g^{2}x+fg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] B*n*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) + (b*c
 - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g)) - B*log(e*(b*x/
(d*x + c) + a/(d*x + c))^n)/(g^2*x + f*g) - A/(g^2*x + f*g)
```

mupad [B] time = 4.64, size = 140, normalized size = 1.54

$$\frac{B\,d\,n\,\ln\left(c+d\,x\right)}{c\,g^{2}-d\,f\,g}-\frac{\ln\left(f+g\,x\right)\,\left(B\,a\,d\,n-B\,b\,c\,n\right)}{a\,c\,g^{2}+b\,d\,f^{2}-a\,d\,f\,g-b\,c\,f\,g}-\frac{B\,\ln\left(e\,\left(\frac{a+b\,x}{c+d\,x}\right)^{n}\right)}{g\,\left(f+g\,x\right)}-\frac{B\,b\,n\,\ln\left(a+b\,x\right)}{a\,g^{2}-b\,f\,g}-\frac{A}{x\,g^{2}+f\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(f + g*x)^2,x)
```

```
[Out] (B*d*n*log(c + d*x))/(c*g^2 - d*f*g) - (log(f + g*x)*(B*a*d*n - B*b*c*n))/(
a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g) - (B*log(e*((a + b*x)/(c + d*x))^n))
/(g*(f + g*x)) - (B*b*n*log(a + b*x))/(a*g^2 - b*f*g) - A/(f*g + g^2*x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**2,x)
```

```
[Out] Exception raised: NotImplementedError
```

3.64 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^3}\,dx$

Optimal. Leaf size=190

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2g(f+gx)^2}+\frac{b^2Bn\log(a+bx)}{2g(bf-ag)^2}-\frac{Bn(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+}{2(bf-ag)^2(df-cg)^2}$$

```
[Out] -1/2*B*(-a*d+b*c)*n/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)+1/2*b^2*B*n*ln(b*x+a)/g/(
-a*g+b*f)^2+1/2*(-A-B*ln(e*((b*x+a)/(d*x+c))^n))/g/(g*x+f)^2-1/2*B*d^2*n*ln
(d*x+c)/g/(-c*g+d*f)^2+1/2*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*n*ln(g*x+f)/
(-a*g+b*f)^2/(-c*g+d*f)^2
```

Rubi [A] time = 0.24, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = $\{2525, 12, 72\}$

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2g(f+gx)^2}+\frac{b^2Bn\log(a+bx)}{2g(bf-ag)^2}-\frac{Bn(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+}{2(bf-ag)^2(df-cg)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^3,x]
```

```
[Out] -(B*(b*c - a*d)*n)/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*n*Log[a +
 b*x])/(2*g*(b*f - a*g)^2) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(2*g*(f
 + g*x)^2) - (B*d^2*n*Log[c + d*x])/(2*g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2
*b*d*f - b*c*g - a*d*g)*n*Log[f + g*x])/(2*(b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^3}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}+\frac{(Bn)\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}\\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}\\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}+\frac{(B(bc-ad)n)\int\left(\frac{b^3}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3}{(bc-ad)(-df+cg)^2(}\right.}{2}\\
&= -\frac{B(bc-ad)n}{2(bf-ag)(df-cg)(f+gx)}+\frac{b^2Bn\log(a+bx)}{2g(bf-ag)^2}-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}-
\end{aligned}
$$

Mathematica [**A**] time = 0.54, size = 173, normalized size = 0.91

$$
\frac{Bn(bc-ad)\left(\frac{b^2\log(a+bx)}{(bc-ad)(bf-ag)^2}+\frac{\frac{d^2\log(c+dx)}{ad-bc}+\frac{g(cg-df)}{(f+gx)(bf-ag)}-\frac{g\log(f+gx)(adg+bcg-2bdf)}{(bf-ag)^2}}{(df-cg)^2}\right)-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{(f+gx)^2}}{2g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^3,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^2) + B*(b*c - a*d)*n*((
b^2*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + ((g*(-(d*f) + c*g))/((b*f -
 a*g)*(f + g*x)) + (d^2*Log[c + d*x])/(-(b*c) + a*d) - (g*(-2*b*d*f + b*c*g
 + a*d*g)*Log[f + g*x])/(b*f - a*g)^2)/(d*f - c*g)^2))/(2*g)
```

fricas [**B**] time = 159.27, size = 1175, normalized size = 6.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(A*b^2*d^2*f^4 + A*a^2*c^2*g^4 - 2*(A*b^2*c*d + A*a*b*d^2)*f^3*g + (A*
b^2*c^2 + 4*A*a*b*c*d + A*a^2*d^2)*f^2*g^2 - 2*(A*a*b*c^2 + A*a^2*c*d)*f*g^
3 + ((B*b^2*c*d - B*a*b*d^2)*f^2*g^2 - (B*b^2*c^2 - B*a^2*d^2)*f*g^3 + (B*a
*b*c^2 - B*a^2*c*d)*g^4)*n*x + (B*b^2*d^2*f^4 + B*a^2*c^2*g^4 - 2*(B*b^2*c*
d + B*a*b*d^2)*f^3*g + (B*b^2*c^2 + 4*B*a*b*c*d + B*a^2*d^2)*f^2*g^2 - 2*(B
*a*b*c^2 + B*a^2*c*d)*f*g^3)*n*log((b*x + a)/(d*x + c)) + ((B*b^2*c*d - B*a
*b*d^2)*f^3*g - (B*b^2*c^2 - B*a^2*d^2)*f^2*g^2 + (B*a*b*c^2 - B*a^2*c*d)*f
*g^3)*n - ((B*b^2*d^2*f^2*g^2 - 2*B*b^2*c*d*f*g^3 + B*b^2*c^2*g^4)*n*x^2 +
2*(B*b^2*d^2*f^3*g - 2*B*b^2*c*d*f^2*g^2 + B*b^2*c^2*f*g^3)*n*x + (B*b^2*d^
2*f^4 - 2*B*b^2*c*d*f^3*g + B*b^2*c^2*f^2*g^2)*n)*log(b*x + a) + ((B*b^2*d^
2*f^2*g^2 - 2*B*a*b*d^2*f*g^3 + B*a^2*d^2*g^4)*n*x^2 + 2*(B*b^2*d^2*f^3*g -
 2*B*a*b*d^2*f^2*g^2 + B*a^2*d^2*f*g^3)*n*x + (B*b^2*d^2*f^4 - 2*B*a*b*d^2*
f^3*g + B*a^2*d^2*f^2*g^2)*n)*log(d*x + c) - ((2*(B*b^2*c*d - B*a*b*d^2)*f*
g^3 - (B*b^2*c^2 - B*a^2*d^2)*g^4)*n*x^2 + 2*(2*(B*b^2*c*d - B*a*b*d^2)*f^2
*g^2 - (B*b^2*c^2 - B*a^2*d^2)*f*g^3)*n*x + (2*(B*b^2*c*d - B*a*b*d^2)*f^3*
g - (B*b^2*c^2 - B*a^2*d^2)*f^2*g^2)*n)*log(g*x + f) + (B*b^2*d^2*f^4 + B*a
^2*c^2*g^4 - 2*(B*b^2*c*d + B*a*b*d^2)*f^3*g + (B*b^2*c^2 + 4*B*a*b*c*d + B
*a^2*d^2)*f^2*g^2 - 2*(B*a*b*c^2 + B*a^2*c*d)*f*g^3)*log(e))/(b^2*d^2*f^6*g
 + a^2*c^2*f^2*g^5 - 2*(b^2*c*d + a*b*d^2)*f^5*g^2 + (b^2*c^2 + 4*a*b*c*d +
```

```
 a^2*d^2)*f^4*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^4 + (b^2*d^2*f^4*g^3 + a^2*
c^2*g^7 - 2*(b^2*c*d + a*b*d^2)*f^3*g^4 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f
^2*g^5 - 2*(a*b*c^2 + a^2*c*d)*f*g^6)*x^2 + 2*(b^2*d^2*f^5*g^2 + a^2*c^2*f*
g^6 - 2*(b^2*c*d + a*b*d^2)*f^4*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^3*g
^4 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^5)*x)
```

giac [B] time = 6.80, size = 2952, normalized size = 15.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] 1/2*((2*B*b^3*c^2*d*f*n - 4*B*a*b^2*c*d^2*f*n + 2*B*a^2*b*d^3*f*n - B*b^3*c
^3*g*n + B*a*b^2*c^2*d*g*n + B*a^2*b*c*d^2*g*n - B*a^3*d^3*g*n)*log(-b*f +
(b*x + a)*d*f/(d*x + c) + a*g - (b*x + a)*c*g/(d*x + c))/(b^2*d^2*f^4 - 2*b
^2*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b*c*d*f^2*g^2 + a^2*
d^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^2*g^4) + (2*B*b^3*c
^2*d*f*n - 4*B*a*b^2*c*d^2*f*n - 2*(b*x + a)*B*b^2*c^2*d^2*f*n/(d*x + c) +
2*B*a^2*b*d^3*f*n + 4*(b*x + a)*B*a*b*c*d^3*f*n/(d*x + c) - 2*(b*x + a)*B*a
^2*d^4*f*n/(d*x + c) - B*b^3*c^3*g*n + B*a*b^2*c^2*d*g*n + 2*(b*x + a)*B*b^
2*c^3*d*g*n/(d*x + c) + B*a^2*b*c*d^2*g*n - 4*(b*x + a)*B*a*b*c^2*d^2*g*n/(
d*x + c) - B*a^3*d^3*g*n + 2*(b*x + a)*B*a^2*c*d^3*g*n/(d*x + c))*log((b*x
+ a)/(d*x + c))/(b^2*d^2*f^4 - 2*(b*x + a)*b*d^3*f^4/(d*x + c) + (b*x + a)^
2*d^4*f^4/(d*x + c)^2 - 2*b^2*c*d*f^3*g - 2*a*b*d^2*f^3*g + 6*(b*x + a)*b*c
*d^2*f^3*g/(d*x + c) + 2*(b*x + a)*a*d^3*f^3*g/(d*x + c) - 4*(b*x + a)^2*c*
d^3*f^3*g/(d*x + c)^2 + b^2*c^2*f^2*g^2 + 4*a*b*c*d*f^2*g^2 - 6*(b*x + a)*b
*c^2*d*f^2*g^2/(d*x + c) + a^2*d^2*f^2*g^2 - 6*(b*x + a)*a*c*d^2*f^2*g^2/(d
*x + c) + 6*(b*x + a)^2*c^2*d^2*f^2*g^2/(d*x + c)^2 - 2*a*b*c^2*f*g^3 + 2*(
b*x + a)*b*c^3*f*g^3/(d*x + c) - 2*a^2*c*d*f*g^3 + 6*(b*x + a)*a*c^2*d*f*g^
3/(d*x + c) - 4*(b*x + a)^2*c^3*d*f*g^3/(d*x + c)^2 + a^2*c^2*g^4 - 2*(b*x
+ a)*a*c^3*g^4/(d*x + c) + (b*x + a)^2*c^4*g^4/(d*x + c)^2) - (2*B*b^3*c^2*
d*f*n - 4*B*a*b^2*c*d^2*f*n + 2*B*a^2*b*d^3*f*n - B*b^3*c^3*g*n + B*a*b^2*c
^2*d*g*n + B*a^2*b*c*d^2*g*n - B*a^3*d^3*g*n)*log((b*x + a)/(d*x + c))/(b^2
*d^2*f^4 - 2*b^2*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b*c*d*
f^2*g^2 + a^2*d^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^2*g^4
) + (B*b^4*c^3*f*g*n - 3*B*a*b^3*c^2*d*f*g*n - (b*x + a)*B*b^3*c^3*d*f*g*n/
(d*x + c) + 3*B*a^2*b^2*c*d^2*f*g*n + 3*(b*x + a)*B*a*b^2*c^2*d^2*f*g*n/(d*
x + c) - B*a^3*b*d^3*f*g*n - 3*(b*x + a)*B*a^2*b*c*d^3*f*g*n/(d*x + c) + (b
*x + a)*B*a^3*d^4*f*g*n/(d*x + c) - B*a*b^3*c^3*g^2*n + (b*x + a)*B*b^3*c^4
*g^2*n/(d*x + c) + 3*B*a^2*b^2*c^2*d*g^2*n - 3*(b*x + a)*B*a*b^2*c^3*d*g^2*
n/(d*x + c) - 3*B*a^3*b*c*d^2*g^2*n + 3*(b*x + a)*B*a^2*b*c^2*d^2*g^2*n/(d*
x + c) + B*a^4*d^3*g^2*n - (b*x + a)*B*a^3*c*d^3*g^2*n/(d*x + c) + 2*A*b^4*
c^2*d*f^2 + 2*B*b^4*c^2*d*f^2 - 4*A*a*b^3*c*d^2*f^2 - 4*B*a*b^3*c*d^2*f^2 -
 2*(b*x + a)*A*b^3*c^2*d^2*f^2/(d*x + c) - 2*(b*x + a)*B*b^3*c^2*d^2*f^2/(d
*x + c) + 2*A*a^2*b^2*d^3*f^2 + 2*B*a^2*b^2*d^3*f^2 + 4*(b*x + a)*A*a*b^2*c
*d^3*f^2/(d*x + c) + 4*(b*x + a)*B*a*b^2*c*d^3*f^2/(d*x + c) - 2*(b*x + a)*
A*a^2*b*d^4*f^2/(d*x + c) - 2*(b*x + a)*B*a^2*b*d^4*f^2/(d*x + c) - A*b^4*c
^3*f*g - B*b^4*c^3*f*g - A*a*b^3*c^2*d*f*g - B*a*b^3*c^2*d*f*g + 2*(b*x + a
)*A*b^3*c^3*d*f*g/(d*x + c) + 2*(b*x + a)*B*b^3*c^3*d*f*g/(d*x + c) + 5*A*a
^2*b^2*c*d^2*f*g + 5*B*a^2*b^2*c*d^2*f*g - 2*(b*x + a)*A*a*b^2*c^2*d^2*f*g/
(d*x + c) - 2*(b*x + a)*B*a*b^2*c^2*d^2*f*g/(d*x + c) - 3*A*a^3*b*d^3*f*g -
 3*B*a^3*b*d^3*f*g - 2*(b*x + a)*A*a^2*b*c*d^3*f*g/(d*x + c) - 2*(b*x + a)*
B*a^2*b*c*d^3*f*g/(d*x + c) + 2*(b*x + a)*A*a^3*d^4*f*g/(d*x + c) + 2*(b*x
+ a)*B*a^3*d^4*f*g/(d*x + c) + A*a*b^3*c^3*g^2 + B*a*b^3*c^3*g^2 - A*a^2*b^
2*c^2*d*g^2 - B*a^2*b^2*c^2*d*g^2 - 2*(b*x + a)*A*a*b^2*c^3*d*g^2/(d*x + c)
 - 2*(b*x + a)*B*a*b^2*c^3*d*g^2/(d*x + c) - A*a^3*b*c*d^2*g^2 - B*a^3*b*c*
d^2*g^2 + 4*(b*x + a)*A*a^2*b*c^2*d^2*g^2/(d*x + c) + 4*(b*x + a)*B*a^2*b*c
^2*d^2*g^2/(d*x + c) + A*a^4*d^3*g^2 + B*a^4*d^3*g^2 - 2*(b*x + a)*A*a^3*c*
d^3*g^2/(d*x + c) - 2*(b*x + a)*B*a^3*c*d^3*g^2/(d*x + c))/(b^3*d^2*f^5 - 2
```

```
*(b*x + a)*b^2*d^3*f^5/(d*x + c) + (b*x + a)^2*b*d^4*f^5/(d*x + c)^2 - 2*b^
3*c*d*f^4*g - 3*a*b^2*d^2*f^4*g + 6*(b*x + a)*b^2*c*d^2*f^4*g/(d*x + c) + 4
*(b*x + a)*a*b*d^3*f^4*g/(d*x + c) - 4*(b*x + a)^2*b*c*d^3*f^4*g/(d*x + c)^
2 - (b*x + a)^2*a*d^4*f^4*g/(d*x + c)^2 + b^3*c^2*f^3*g^2 + 6*a*b^2*c*d*f^3
*g^2 - 6*(b*x + a)*b^2*c^2*d*f^3*g^2/(d*x + c) + 3*a^2*b*d^2*f^3*g^2 - 12*(
b*x + a)*a*b*c*d^2*f^3*g^2/(d*x + c) + 6*(b*x + a)^2*b*c^2*d^2*f^3*g^2/(d*x
 + c)^2 - 2*(b*x + a)*a^2*d^3*f^3*g^2/(d*x + c) + 4*(b*x + a)^2*a*c*d^3*f^3
*g^2/(d*x + c)^2 - 3*a*b^2*c^2*f^2*g^3 + 2*(b*x + a)*b^2*c^3*f^2*g^3/(d*x +
 c) - 6*a^2*b*c*d*f^2*g^3 + 12*(b*x + a)*a*b*c^2*d*f^2*g^3/(d*x + c) - 4*(b
*x + a)^2*b*c^3*d*f^2*g^3/(d*x + c)^2 - a^3*d^2*f^2*g^3 + 6*(b*x + a)*a^2*c
*d^2*f^2*g^3/(d*x + c) - 6*(b*x + a)^2*a*c^2*d^2*f^2*g^3/(d*x + c)^2 + 3*a^
2*b*c^2*f*g^4 - 4*(b*x + a)*a*b*c^3*f*g^4/(d*x + c) + (b*x + a)^2*b*c^4*f*g
^4/(d*x + c)^2 + 2*a^3*c*d*f*g^4 - 6*(b*x + a)*a^2*c^2*d*f*g^4/(d*x + c) +
4*(b*x + a)^2*a*c^3*d*f*g^4/(d*x + c)^2 - a^3*c^2*g^5 + 2*(b*x + a)*a^2*c^3
*g^5/(d*x + c) - (b*x + a)^2*a*c^4*g^5/(d*x + c)^2))*(b*c/(b*c - a*d)^2 - a
*d/(b*c - a*d)^2)
```

maple [F]   time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{B \ln\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}{\left(gx+f\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^3,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^3,x)
```

maxima [A]   time = 1.00, size = 355, normalized size = 1.87

$$\frac{1}{2} (\frac{b^{2} \log\left(bx+a\right)}{b^{2} f^{2} g - 2\,abfg^{2} + a^{2} g^{3}} - \frac{d^{2} \log\left(dx+c\right)}{d^{2} f^{2} g - 2\,cdfg^{2} + c^{2} g^{3}} + \frac{(2\left(b^{2}cd - abd^{2}\right)f - (b^{2}c^{2} - a^{2}d^{2}}{b^{2}d^{2}f^{4} + a^{2}c^{2}g^{4} - 2\left(b^{2}cd + abd^{2}\right)f^{3}g + (b^{2}c^{2} + 4\,abc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c
)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2
 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d
^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)
*f*g^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g
 + a*c*g^3 - (b*c + a*d)*f*g^2)*x))*B*n - 1/2*B*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n)/(g^3*x^2 + 2*f*g^2*x + f^2*g) - 1/2*A/(g^3*x^2 + 2*f*g^2*x + f^
2*g)
```

mupad [B]   time = 6.20, size = 430, normalized size = 2.26

$$\frac{\ln\left(f+g\,x\right)\,\left(g\,\left(B\,a^{2}\,d^{2}\,n - B\,b^{2}\,c^{2}\,n\right) - 2\,B\,a\,b\,d^{2}\,f\,n + 2\,B\,b^{2}\,c\,d\,f\,n\right)}{2\,a^{2}\,c^{2}\,g^{4} - 4\,a^{2}\,c\,d\,f\,g^{3} + 2\,a^{2}\,d^{2}\,f^{2}\,g^{2} - 4\,a\,b\,c^{2}\,f\,g^{3} + 8\,a\,b\,c\,d\,f^{2}\,g^{2} - 4\,a\,b\,d^{2}\,f^{3}\,g + 2\,b^{2}\,c^{2}\,f^{2}\,g^{2} - 4\,b^{2}\,c\,d\,f^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(f + g*x)^3,x)
```

```
[Out] (log(f + g*x)*(g*(B*a^2*d^2*n - B*b^2*c^2*n) - 2*B*a*b*d^2*f*n + 2*B*b^2*c*
d*f*n))/(2*a^2*c^2*g^4 + 2*b^2*d^2*f^4 + 2*a^2*d^2*f^2*g^2 + 2*b^2*c^2*f^2*
```

```
g^2 - 4*a*b*c^2*f*g^3 - 4*a*b*d^2*f^3*g - 4*a^2*c*d*f*g^3 - 4*b^2*c*d*f^3*g
 + 8*a*b*c*d*f^2*g^2) - ((A*a*c*g^2 + A*b*d*f^2 - A*a*d*f*g - A*b*c*f*g - B
*a*d*f*g*n + B*b*c*f*g*n)/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g) - (x*(B*a
*d*g^2*n - B*b*c*g^2*n))/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g))/(2*f^2*g
+ 2*g^3*x^2 + 4*f*g^2*x) - (B*log(e*((a + b*x)/(c + d*x))^n))/(2*g*(f^2 + g
^2*x^2 + 2*f*g*x)) + (B*b^2*n*log(a + b*x))/(2*a^2*g^3 + 2*b^2*f^2*g - 4*a*
b*f*g^2) - (B*d^2*n*log(c + d*x))/(2*c^2*g^3 + 2*d^2*f^2*g - 4*c*d*f*g^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**3,x)
```

```
[Out] Timed out
```

3.65 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^4}\,dx$

Optimal. Leaf size=283

$$\frac{Bn(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3g(f+gx)^3}+\frac{b^3B}{3}$$

```
[Out] -1/6*B*(-a*d+b*c)*n/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)^2-1/3*B*(-a*d+b*c)*(-a*d*
g-b*c*g+2*b*d*f)*n/(-a*g+b*f)^2/(-c*g+d*f)^2/(g*x+f)+1/3*b^3*B*n*ln(b*x+a)/
g/(-a*g+b*f)^3+1/3*(-A-B*ln(e*((b*x+a)/(d*x+c))^n))/g/(g*x+f)^3-1/3*B*d^3*n
*ln(d*x+c)/g/(-c*g+d*f)^3+1/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f
)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))*n*ln(g*x+f)/(-a*g+b*f)^3/(-c*g+d*f)^3
```

Rubi [A] time = 0.46, antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 72}

$$\frac{Bn(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3g(f+gx)^3}+\frac{b^3B}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^4,x]
```

```
[Out] -(B*(b*c - a*d)*n)/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (B*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g)*n)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (
b^3*B*n*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[e*((a + b*x)/(c + d*
x))^n])/(3*g*(f + g*x)^3) - (B*d^3*n*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2))*n*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^4}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3g(f+gx)^3}+\frac{(Bn)\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}\\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3g(f+gx)^3}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}\\
&= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3g(f+gx)^3}+\frac{(B(bc-ad)n)\int\Bigg(\frac{b^4}{(bc-ad)(bf-ag)^3(a+bx)}+\frac{d^4}{(bc-ad)(-df+cg)^3(c+d}}{}\\
&= -\frac{B(bc-ad)n}{6(bf-ag)(df-cg)(f+gx)^2}-\frac{B(bc-ad)(2bdf-bcg-adg)n}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^3Bn\log(a+}{3g(bf-ag)}
\end{aligned}
$$

Mathematica [**A**] time = 0.89, size = 264, normalized size = 0.93

$$
\frac{Bn(bc-ad)\Bigg(\frac{g\log(f+gx)\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(bf-ag)^3(df-cg)^3}+\frac{b^3\log(a+bx)}{(bc-ad)(bf-ag)^3}+\frac{d^3\log(c+dx)}{(bc-ad)(cg-df)^3}+\frac{g(adg+bcg-2bdf)}{(f+gx)(bf-ag)^2(df-cg)}}{3g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^4,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^3) + B*(b*c - a*d)*n*(-
1/2*g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (g*(-2*b*d*f + b*c*g + a*d*g)
)/((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*Log[a + b*x])/((b*c - a*d)
*(b*f - a*g)^3) + (d^3*Log[c + d*x])/((b*c - a*d)*(-(d*f) + c*g)^3) + (g*(a
^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)
)*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(3*g)
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [**B**] time = 9.25, size = 9570, normalized size = 33.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] 1/6*(2*(3*B*b^4*c^2*d^2*f^2*n - 6*B*a*b^3*c*d^3*f^2*n + 3*B*a^2*b^2*d^4*f^2
*n - 3*B*b^4*c^3*d*f*g*n + 3*B*a*b^3*c^2*d^2*f*g*n + 3*B*a^2*b^2*c*d^3*f*g*
n - 3*B*a^3*b*d^4*f*g*n + B*b^4*c^4*g^2*n - B*a*b^3*c^3*d*g^2*n - B*a^3*b*c
*d^3*g^2*n + B*a^4*d^4*g^2*n)*log(-b*f + (b*x + a)*d*f/(d*x + c) + a*g - (b
*x + a)*c*g/(d*x + c))/(b^3*d^3*f^6 - 3*b^3*c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g
 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 + 3*a^2*b*d^3*f^4*g^2 - b^3*
c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 - a^3*d^3*f^3*g
^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2*g^4 + 3*a^3*c*d^2*f^2*g^4 - 3*
```

```
a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^3*g^6) + 2*(3*B*b^4*c^2*d^2*f^2
*n - 6*B*a*b^3*c*d^3*f^2*n - 6*(b*x + a)*B*b^3*c^2*d^3*f^2*n/(d*x + c) + 3*
B*a^2*b^2*d^4*f^2*n + 12*(b*x + a)*B*a*b^2*c*d^4*f^2*n/(d*x + c) + 3*(b*x +
 a)^2*B*b^2*c^2*d^4*f^2*n/(d*x + c)^2 - 6*(b*x + a)*B*a^2*b*d^5*f^2*n/(d*x
+ c) - 6*(b*x + a)^2*B*a*b*c*d^5*f^2*n/(d*x + c)^2 + 3*(b*x + a)^2*B*a^2*d^
6*f^2*n/(d*x + c)^2 - 3*B*b^4*c^3*d*f*g*n + 3*B*a*b^3*c^2*d^2*f*g*n + 9*(b*
x + a)*B*b^3*c^3*d^2*f*g*n/(d*x + c) + 3*B*a^2*b^2*c*d^3*f*g*n - 15*(b*x +
a)*B*a*b^2*c^2*d^3*f*g*n/(d*x + c) - 6*(b*x + a)^2*B*b^2*c^3*d^3*f*g*n/(d*x
 + c)^2 - 3*B*a^3*b*d^4*f*g*n + 3*(b*x + a)*B*a^2*b*c*d^4*f*g*n/(d*x + c) +
 12*(b*x + a)^2*B*a*b*c^2*d^4*f*g*n/(d*x + c)^2 + 3*(b*x + a)*B*a^3*d^5*f*g
*n/(d*x + c) - 6*(b*x + a)^2*B*a^2*c*d^5*f*g*n/(d*x + c)^2 + B*b^4*c^4*g^2*
n - B*a*b^3*c^3*d*g^2*n - 3*(b*x + a)*B*b^3*c^4*d*g^2*n/(d*x + c) + 3*(b*x
+ a)*B*a*b^2*c^3*d^2*g^2*n/(d*x + c) + 3*(b*x + a)^2*B*b^2*c^4*d^2*g^2*n/(d
*x + c)^2 - B*a^3*b*c*d^3*g^2*n + 3*(b*x + a)*B*a^2*b*c^2*d^3*g^2*n/(d*x +
c) - 6*(b*x + a)^2*B*a*b*c^3*d^3*g^2*n/(d*x + c)^2 + B*a^4*d^4*g^2*n - 3*(b
*x + a)*B*a^3*c*d^4*g^2*n/(d*x + c) + 3*(b*x + a)^2*B*a^2*c^2*d^4*g^2*n/(d*
x + c)^2)*log((b*x + a)/(d*x + c))/(b^3*d^3*f^6 - 3*(b*x + a)*b^2*d^4*f^6/(
d*x + c) + 3*(b*x + a)^2*b*d^5*f^6/(d*x + c)^2 - (b*x + a)^3*d^6*f^6/(d*x +
 c)^3 - 3*b^3*c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g + 12*(b*x + a)*b^2*c*d^3*f^5*
g/(d*x + c) + 6*(b*x + a)*a*b*d^4*f^5*g/(d*x + c) - 15*(b*x + a)^2*b*c*d^4*
f^5*g/(d*x + c)^2 - 3*(b*x + a)^2*a*d^5*f^5*g/(d*x + c)^2 + 6*(b*x + a)^3*c
*d^5*f^5*g/(d*x + c)^3 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 - 18*(
b*x + a)*b^2*c^2*d^2*f^4*g^2/(d*x + c) + 3*a^2*b*d^3*f^4*g^2 - 24*(b*x + a)
*a*b*c*d^3*f^4*g^2/(d*x + c) + 30*(b*x + a)^2*b*c^2*d^3*f^4*g^2/(d*x + c)^2
 - 3*(b*x + a)*a^2*d^4*f^4*g^2/(d*x + c) + 15*(b*x + a)^2*a*c*d^4*f^4*g^2/(
d*x + c)^2 - 15*(b*x + a)^3*c^2*d^4*f^4*g^2/(d*x + c)^3 - b^3*c^3*f^3*g^3 -
 9*a*b^2*c^2*d*f^3*g^3 + 12*(b*x + a)*b^2*c^3*d*f^3*g^3/(d*x + c) - 9*a^2*b
*c*d^2*f^3*g^3 + 36*(b*x + a)*a*b*c^2*d^2*f^3*g^3/(d*x + c) - 30*(b*x + a)^
2*b*c^3*d^2*f^3*g^3/(d*x + c)^2 - a^3*d^3*f^3*g^3 + 12*(b*x + a)*a^2*c*d^3*
f^3*g^3/(d*x + c) - 30*(b*x + a)^2*a*c^2*d^3*f^3*g^3/(d*x + c)^2 + 20*(b*x
+ a)^3*c^3*d^3*f^3*g^3/(d*x + c)^3 + 3*a*b^2*c^3*f^2*g^4 - 3*(b*x + a)*b^2*
c^4*f^2*g^4/(d*x + c) + 9*a^2*b*c^2*d*f^2*g^4 - 24*(b*x + a)*a*b*c^3*d*f^2*
g^4/(d*x + c) + 15*(b*x + a)^2*b*c^4*d*f^2*g^4/(d*x + c)^2 + 3*a^3*c*d^2*f^
2*g^4 - 18*(b*x + a)*a^2*c^2*d^2*f^2*g^4/(d*x + c) + 30*(b*x + a)^2*a*c^3*d
^2*f^2*g^4/(d*x + c)^2 - 15*(b*x + a)^3*c^4*d^2*f^2*g^4/(d*x + c)^3 - 3*a^2
*b*c^3*f*g^5 + 6*(b*x + a)*a*b*c^4*f*g^5/(d*x + c) - 3*(b*x + a)^2*b*c^5*f*
g^5/(d*x + c)^2 - 3*a^3*c^2*d*f*g^5 + 12*(b*x + a)*a^2*c^3*d*f*g^5/(d*x + c
) - 15*(b*x + a)^2*a*c^4*d*f*g^5/(d*x + c)^2 + 6*(b*x + a)^3*c^5*d*f*g^5/(d
*x + c)^3 + a^3*c^3*g^6 - 3*(b*x + a)*a^2*c^4*g^6/(d*x + c) + 3*(b*x + a)^2
*a*c^5*g^6/(d*x + c)^2 - (b*x + a)^3*c^6*g^6/(d*x + c)^3) - 2*(3*B*b^4*c^2*
d^2*f^2*n - 6*B*a*b^3*c*d^3*f^2*n + 3*B*a^2*b^2*d^4*f^2*n - 3*B*b^4*c^3*d*f
*g*n + 3*B*a*b^3*c^2*d^2*f*g*n + 3*B*a^2*b^2*c*d^3*f*g*n - 3*B*a^3*b*d^4*f*
g*n + B*b^4*c^4*g^2*n - B*a*b^3*c^3*d*g^2*n - B*a^3*b*c*d^3*g^2*n + B*a^4*d
^4*g^2*n)*log((b*x + a)/(d*x + c))/(b^3*d^3*f^6 - 3*b^3*c*d^2*f^5*g - 3*a*b
^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 + 3*a^2*b*d^3*f^
4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 - a
^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2*g^4 + 3*a^3*c*d^2*
f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^3*g^6) + (6*B*b^6*c
^3*d*f^3*g*n - 18*B*a*b^5*c^2*d^2*f^3*g*n - 12*(b*x + a)*B*b^5*c^3*d^2*f^3*
g*n/(d*x + c) + 18*B*a^2*b^4*c*d^3*f^3*g*n + 36*(b*x + a)*B*a*b^4*c^2*d^3*f
^3*g*n/(d*x + c) + 6*(b*x + a)^2*B*b^4*c^3*d^3*f^3*g*n/(d*x + c)^2 - 6*B*a^
3*b^3*d^4*f^3*g*n - 36*(b*x + a)*B*a^2*b^3*c*d^4*f^3*g*n/(d*x + c) - 18*(b*
x + a)^2*B*a*b^3*c^2*d^4*f^3*g*n/(d*x + c)^2 + 12*(b*x + a)*B*a^3*b^2*d^5*f
^3*g*n/(d*x + c) + 18*(b*x + a)^2*B*a^2*b^2*c*d^5*f^3*g*n/(d*x + c)^2 - 6*(
b*x + a)^2*B*a^3*b*d^6*f^3*g*n/(d*x + c)^2 - 3*B*b^6*c^4*f^2*g^2*n - 6*B*a*
b^5*c^3*d*f^2*g^2*n + 17*(b*x + a)*B*b^5*c^4*d*f^2*g^2*n/(d*x + c) + 36*B*a
^2*b^4*c^2*d^2*f^2*g^2*n - 32*(b*x + a)*B*a*b^4*c^3*d^2*f^2*g^2*n/(d*x + c)
 - 14*(b*x + a)^2*B*b^4*c^4*d^2*f^2*g^2*n/(d*x + c)^2 - 42*B*a^3*b^3*c*d^3*
f^2*g^2*n - 6*(b*x + a)*B*a^2*b^3*c^2*d^3*f^2*g^2*n/(d*x + c) + 38*(b*x + a
```

```
)^2*B*a*b^3*c^3*d^3*f^2*g^2*n/(d*x + c)^2 + 15*B*a^4*b^2*d^4*f^2*g^2*n + 40
*(b*x + a)*B*a^3*b^2*c*d^4*f^2*g^2*n/(d*x + c) - 30*(b*x + a)^2*B*a^2*b^2*c
^2*d^4*f^2*g^2*n/(d*x + c)^2 - 19*(b*x + a)*B*a^4*b*d^5*f^2*g^2*n/(d*x + c)
 + 2*(b*x + a)^2*B*a^3*b*c*d^5*f^2*g^2*n/(d*x + c)^2 + 4*(b*x + a)^2*B*a^4*
d^6*f^2*g^2*n/(d*x + c)^2 + 6*B*a*b^5*c^4*f*g^3*n - 5*(b*x + a)*B*b^5*c^5*f
*g^3*n/(d*x + c) - 6*B*a^2*b^4*c^3*d*f*g^3*n - 9*(b*x + a)*B*a*b^4*c^4*d*f*
g^3*n/(d*x + c) + 10*(b*x + a)^2*B*b^4*c^5*d*f*g^3*n/(d*x + c)^2 - 18*B*a^3
*b^3*c^2*d^2*f*g^3*n + 50*(b*x + a)*B*a^2*b^3*c^3*d^2*f*g^3*n/(d*x + c) - 2
2*(b*x + a)^2*B*a*b^3*c^4*d^2*f*g^3*n/(d*x + c)^2 + 30*B*a^4*b^2*c*d^3*f*g^
3*n - 46*(b*x + a)*B*a^3*b^2*c^2*d^3*f*g^3*n/(d*x + c) + 6*(b*x + a)^2*B*a^
2*b^2*c^3*d^3*f*g^3*n/(d*x + c)^2 - 12*B*a^5*b*d^4*f*g^3*n + 3*(b*x + a)*B*
a^4*b*c*d^4*f*g^3*n/(d*x + c) + 14*(b*x + a)^2*B*a^3*b*c^2*d^4*f*g^3*n/(d*x
 + c)^2 + 7*(b*x + a)*B*a^5*d^5*f*g^3*n/(d*x + c) - 8*(b*x + a)^2*B*a^4*c*d
^5*f*g^3*n/(d*x + c)^2 - 3*B*a^2*b^4*c^4*g^4*n + 5*(b*x + a)*B*a*b^4*c^5*g^
4*n/(d*x + c) - 2*(b*x + a)^2*B*b^4*c^6*g^4*n/(d*x + c)^2 + 6*B*a^3*b^3*c^3
*d*g^4*n - 8*(b*x + a)*B*a^2*b^3*c^4*d*g^4*n/(d*x + c) + 2*(b*x + a)^2*B*a*
b^3*c^5*d*g^4*n/(d*x + c)^2 - 6*(b*x + a)*B*a^3*b^2*c^3*d^2*g^4*n/(d*x + c)
 + 6*(b*x + a)^2*B*a^2*b^2*c^4*d^2*g^4*n/(d*x + c)^2 - 6*B*a^5*b*c*d^3*g^4*
n + 16*(b*x + a)*B*a^4*b*c^2*d^3*g^4*n/(d*x + c) - 10*(b*x + a)^2*B*a^3*b*c
^3*d^3*g^4*n/(d*x + c)^2 + 3*B*a^6*d^4*g^4*n - 7*(b*x + a)*B*a^5*c*d^4*g^4*
n/(d*x + c) + 4*(b*x + a)^2*B*a^4*c^2*d^4*g^4*n/(d*x + c)^2 + 6*A*b^6*c^2*d
^2*f^4 + 6*B*b^6*c^2*d^2*f^4 - 12*A*a*b^5*c*d^3*f^4 - 12*B*a*b^5*c*d^3*f^4
- 12*(b*x + a)*A*b^5*c^2*d^3*f^4/(d*x + c) - 12*(b*x + a)*B*b^5*c^2*d^3*f^4
/(d*x + c) + 6*A*a^2*b^4*d^4*f^4 + 6*B*a^2*b^4*d^4*f^4 + 24*(b*x + a)*A*a*b
^4*c*d^4*f^4/(d*x + c) + 24*(b*x + a)*B*a*b^4*c*d^4*f^4/(d*x + c) + 6*(b*x
+ a)^2*A*b^4*c^2*d^4*f^4/(d*x + c)^2 + 6*(b*x + a)^2*B*b^4*c^2*d^4*f^4/(d*x
 + c)^2 - 12*(b*x + a)*A*a^2*b^3*d^5*f^4/(d*x + c) - 12*(b*x + a)*B*a^2*b^3
*d^5*f^4/(d*x + c) - 12*(b*x + a)^2*A*a*b^3*c*d^5*f^4/(d*x + c)^2 - 12*(b*x
 + a)^2*B*a*b^3*c*d^5*f^4/(d*x + c)^2 + 6*(b*x + a)^2*A*a^2*b^2*d^6*f^4/(d*
x + c)^2 + 6*(b*x + a)^2*B*a^2*b^2*d^6*f^4/(d*x + c)^2 - 6*A*b^6*c^3*d*f^3*
g - 6*B*b^6*c^3*d*f^3*g - 6*A*a*b^5*c^2*d^2*f^3*g - 6*B*a*b^5*c^2*d^2*f^3*g
 + 18*(b*x + a)*A*b^5*c^3*d^2*f^3*g/(d*x + c) + 18*(b*x + a)*B*b^5*c^3*d^2*
f^3*g/(d*x + c) + 30*A*a^2*b^4*c*d^3*f^3*g + 30*B*a^2*b^4*c*d^3*f^3*g - 6*(
b*x + a)*A*a*b^4*c^2*d^3*f^3*g/(d*x + c) - 6*(b*x + a)*B*a*b^4*c^2*d^3*f^3*
g/(d*x + c) - 12*(b*x + a)^2*A*b^4*c^3*d^3*f^3*g/(d*x + c)^2 - 12*(b*x + a)
^2*B*b^4*c^3*d^3*f^3*g/(d*x + c)^2 - 18*A*a^3*b^3*d^4*f^3*g - 18*B*a^3*b^3*
d^4*f^3*g - 42*(b*x + a)*A*a^2*b^3*c*d^4*f^3*g/(d*x + c) - 42*(b*x + a)*B*a
^2*b^3*c*d^4*f^3*g/(d*x + c) + 12*(b*x + a)^2*A*a*b^3*c^2*d^4*f^3*g/(d*x +
c)^2 + 12*(b*x + a)^2*B*a*b^3*c^2*d^4*f^3*g/(d*x + c)^2 + 30*(b*x + a)*A*a^
3*b^2*d^5*f^3*g/(d*x + c) + 30*(b*x + a)*B*a^3*b^2*d^5*f^3*g/(d*x + c) + 12
*(b*x + a)^2*A*a^2*b^2*c*d^5*f^3*g/(d*x + c)^2 + 12*(b*x + a)^2*B*a^2*b^2*c
*d^5*f^3*g/(d*x + c)^2 - 12*(b*x + a)^2*A*a^3*b*d^6*f^3*g/(d*x + c)^2 - 12*
(b*x + a)^2*B*a^3*b*d^6*f^3*g/(d*x + c)^2 + 2*A*b^6*c^4*f^2*g^2 + 2*B*b^6*c
^4*f^2*g^2 + 10*A*a*b^5*c^3*d*f^2*g^2 + 10*B*a*b^5*c^3*d*f^2*g^2 - 6*(b*x +
 a)*A*b^5*c^4*d*f^2*g^2/(d*x + c) - 6*(b*x + a)*B*b^5*c^4*d*f^2*g^2/(d*x +
c) - 6*A*a^2*b^4*c^2*d^2*f^2*g^2 - 6*B*a^2*b^4*c^2*d^2*f^2*g^2 - 30*(b*x +
a)*A*a*b^4*c^3*d^2*f^2*g^2/(d*x + c) - 30*(b*x + a)*B*a*b^4*c^3*d^2*f^2*g^2
/(d*x + c) + 6*(b*x + a)^2*A*b^4*c^4*d^2*f^2*g^2/(d*x + c)^2 + 6*(b*x + a)^
2*B*b^4*c^4*d^2*f^2*g^2/(d*x + c)^2 - 26*A*a^3*b^3*c*d^3*f^2*g^2 - 26*B*a^3
*b^3*c*d^3*f^2*g^2 + 54*(b*x + a)*A*a^2*b^3*c^2*d^3*f^2*g^2/(d*x + c) + 54*
(b*x + a)*B*a^2*b^3*c^2*d^3*f^2*g^2/(d*x + c) + 12*(b*x + a)^2*A*a*b^3*c^3*
d^3*f^2*g^2/(d*x + c)^2 + 12*(b*x + a)^2*B*a*b^3*c^3*d^3*f^2*g^2/(d*x + c)^
2 + 20*A*a^4*b^2*d^4*f^2*g^2 + 20*B*a^4*b^2*d^4*f^2*g^2 + 6*(b*x + a)*A*a^3
*b^2*c*d^4*f^2*g^2/(d*x + c) + 6*(b*x + a)*B*a^3*b^2*c*d^4*f^2*g^2/(d*x + c
) - 36*(b*x + a)^2*A*a^2*b^2*c^2*d^4*f^2*g^2/(d*x + c)^2 - 36*(b*x + a)^2*B
*a^2*b^2*c^2*d^4*f^2*g^2/(d*x + c)^2 - 24*(b*x + a)*A*a^4*b*d^5*f^2*g^2/(d*
x + c) - 24*(b*x + a)*B*a^4*b*d^5*f^2*g^2/(d*x + c) + 12*(b*x + a)^2*A*a^3*
b*c*d^5*f^2*g^2/(d*x + c)^2 + 12*(b*x + a)^2*B*a^3*b*c*d^5*f^2*g^2/(d*x + c
)^2 + 6*(b*x + a)^2*A*a^4*d^6*f^2*g^2/(d*x + c)^2 + 6*(b*x + a)^2*B*a^4*d^6
```

```
*f^2*g^2/(d*x + c)^2 - 4*A*a*b^5*c^4*f*g^3 - 4*B*a*b^5*c^4*f*g^3 - 2*A*a^2*
b^4*c^3*d*f*g^3 - 2*B*a^2*b^4*c^3*d*f*g^3 + 12*(b*x + a)*A*a*b^4*c^4*d*f*g^
3/(d*x + c) + 12*(b*x + a)*B*a*b^4*c^4*d*f*g^3/(d*x + c) + 6*A*a^3*b^3*c^2*
d^2*f*g^3 + 6*B*a^3*b^3*c^2*d^2*f*g^3 + 6*(b*x + a)*A*a^2*b^3*c^3*d^2*f*g^3
/(d*x + c) + 6*(b*x + a)*B*a^2*b^3*c^3*d^2*f*g^3/(d*x + c) - 12*(b*x + a)^2
*A*a*b^3*c^4*d^2*f*g^3/(d*x + c)^2 - 12*(b*x + a)^2*B*a*b^3*c^4*d^2*f*g^3/(
d*x + c)^2 + 10*A*a^4*b^2*c*d^3*f*g^3 + 10*B*a^4*b^2*c*d^3*f*g^3 - 42*(b*x
+ a)*A*a^3*b^2*c^2*d^3*f*g^3/(d*x + c) - 42*(b*x + a)*B*a^3*b^2*c^2*d^3*f*g
^3/(d*x + c) + 12*(b*x + a)^2*A*a^2*b^2*c^3*d^3*f*g^3/(d*x + c)^2 + 12*(b*x
 + a)^2*B*a^2*b^2*c^3*d^3*f*g^3/(d*x + c)^2 - 10*A*a^5*b*d^4*f*g^3 - 10*B*a
^5*b*d^4*f*g^3 + 18*(b*x + a)*A*a^4*b*c*d^4*f*g^3/(d*x + c) + 18*(b*x + a)*
B*a^4*b*c*d^4*f*g^3/(d*x + c) + 12*(b*x + a)^2*A*a^3*b*c^2*d^4*f*g^3/(d*x +
 c)^2 + 12*(b*x + a)^2*B*a^3*b*c^2*d^4*f*g^3/(d*x + c)^2 + 6*(b*x + a)*A*a^
5*d^5*f*g^3/(d*x + c) + 6*(b*x + a)*B*a^5*d^5*f*g^3/(d*x + c) - 12*(b*x + a
)^2*A*a^4*c*d^5*f*g^3/(d*x + c)^2 - 12*(b*x + a)^2*B*a^4*c*d^5*f*g^3/(d*x +
 c)^2 + 2*A*a^2*b^4*c^4*g^4 + 2*B*a^2*b^4*c^4*g^4 - 2*A*a^3*b^3*c^3*d*g^4 -
 2*B*a^3*b^3*c^3*d*g^4 - 6*(b*x + a)*A*a^2*b^3*c^4*d*g^4/(d*x + c) - 6*(b*x
 + a)*B*a^2*b^3*c^4*d*g^4/(d*x + c) + 6*(b*x + a)*A*a^3*b^2*c^3*d^2*g^4/(d*
x + c) + 6*(b*x + a)*B*a^3*b^2*c^3*d^2*g^4/(d*x + c) + 6*(b*x + a)^2*A*a^2*
b^2*c^4*d^2*g^4/(d*x + c)^2 + 6*(b*x + a)^2*B*a^2*b^2*c^4*d^2*g^4/(d*x + c)
^2 - 2*A*a^5*b*c*d^3*g^4 - 2*B*a^5*b*c*d^3*g^4 + 6*(b*x + a)*A*a^4*b*c^2*d^
3*g^4/(d*x + c) + 6*(b*x + a)*B*a^4*b*c^2*d^3*g^4/(d*x + c) - 12*(b*x + a)^
2*A*a^3*b*c^3*d^3*g^4/(d*x + c)^2 - 12*(b*x + a)^2*B*a^3*b*c^3*d^3*g^4/(d*x
 + c)^2 + 2*A*a^6*d^4*g^4 + 2*B*a^6*d^4*g^4 - 6*(b*x + a)*A*a^5*c*d^4*g^4/(
d*x + c) - 6*(b*x + a)*B*a^5*c*d^4*g^4/(d*x + c) + 6*(b*x + a)^2*A*a^4*c^2*
d^4*g^4/(d*x + c)^2 + 6*(b*x + a)^2*B*a^4*c^2*d^4*g^4/(d*x + c)^2)/(b^5*d^3
*f^8 - 3*(b*x + a)*b^4*d^4*f^8/(d*x + c) + 3*(b*x + a)^2*b^3*d^5*f^8/(d*x +
 c)^2 - (b*x + a)^3*b^2*d^6*f^8/(d*x + c)^3 - 3*b^5*c*d^2*f^7*g - 5*a*b^4*d
^3*f^7*g + 12*(b*x + a)*b^4*c*d^3*f^7*g/(d*x + c) + 12*(b*x + a)*a*b^3*d^4*
f^7*g/(d*x + c) - 15*(b*x + a)^2*b^3*c*d^4*f^7*g/(d*x + c)^2 - 9*(b*x + a)^
2*a*b^2*d^5*f^7*g/(d*x + c)^2 + 6*(b*x + a)^3*b^2*c*d^5*f^7*g/(d*x + c)^3 +
 2*(b*x + a)^3*a*b*d^6*f^7*g/(d*x + c)^3 + 3*b^5*c^2*d*f^6*g^2 + 15*a*b^4*c
*d^2*f^6*g^2 - 18*(b*x + a)*b^4*c^2*d^2*f^6*g^2/(d*x + c) + 10*a^2*b^3*d^3*
f^6*g^2 - 48*(b*x + a)*a*b^3*c*d^3*f^6*g^2/(d*x + c) + 30*(b*x + a)^2*b^3*c
^2*d^3*f^6*g^2/(d*x + c)^2 - 18*(b*x + a)*a^2*b^2*d^4*f^6*g^2/(d*x + c) + 4
5*(b*x + a)^2*a*b^2*c*d^4*f^6*g^2/(d*x + c)^2 - 15*(b*x + a)^3*b^2*c^2*d^4*
f^6*g^2/(d*x + c)^3 + 9*(b*x + a)^2*a^2*b*d^5*f^6*g^2/(d*x + c)^2 - 12*(b*x
 + a)^3*a*b*c*d^5*f^6*g^2/(d*x + c)^3 - (b*x + a)^3*a^2*d^6*f^6*g^2/(d*x +
c)^3 - b^5*c^3*f^5*g^3 - 15*a*b^4*c^2*d*f^5*g^3 + 12*(b*x + a)*b^4*c^3*d*f^
5*g^3/(d*x + c) - 30*a^2*b^3*c*d^2*f^5*g^3 + 72*(b*x + a)*a*b^3*c^2*d^2*f^5
*g^3/(d*x + c) - 30*(b*x + a)^2*b^3*c^3*d^2*f^5*g^3/(d*x + c)^2 - 10*a^3*b^
2*d^3*f^5*g^3 + 72*(b*x + a)*a^2*b^2*c*d^3*f^5*g^3/(d*x + c) - 90*(b*x + a)
^2*a*b^2*c^2*d^3*f^5*g^3/(d*x + c)^2 + 20*(b*x + a)^3*b^2*c^3*d^3*f^5*g^3/(
d*x + c)^3 + 12*(b*x + a)*a^3*b*d^4*f^5*g^3/(d*x + c) - 45*(b*x + a)^2*a^2*
b*c*d^4*f^5*g^3/(d*x + c)^2 + 30*(b*x + a)^3*a*b*c^2*d^4*f^5*g^3/(d*x + c)^
3 - 3*(b*x + a)^2*a^3*d^5*f^5*g^3/(d*x + c)^2 + 6*(b*x + a)^3*a^2*c*d^5*f^5
*g^3/(d*x + c)^3 + 5*a*b^4*c^3*f^4*g^4 - 3*(b*x + a)*b^4*c^4*f^4*g^4/(d*x +
 c) + 30*a^2*b^3*c^2*d*f^4*g^4 - 48*(b*x + a)*a*b^3*c^3*d*f^4*g^4/(d*x + c)
 + 15*(b*x + a)^2*b^3*c^4*d*f^4*g^4/(d*x + c)^2 + 30*a^3*b^2*c*d^2*f^4*g^4
- 108*(b*x + a)*a^2*b^2*c^2*d^2*f^4*g^4/(d*x + c) + 90*(b*x + a)^2*a*b^2*c^
3*d^2*f^4*g^4/(d*x + c)^2 - 15*(b*x + a)^3*b^2*c^4*d^2*f^4*g^4/(d*x + c)^3
+ 5*a^4*b*d^3*f^4*g^4 - 48*(b*x + a)*a^3*b*c*d^3*f^4*g^4/(d*x + c) + 90*(b*
x + a)^2*a^2*b*c^2*d^3*f^4*g^4/(d*x + c)^2 - 40*(b*x + a)^3*a*b*c^3*d^3*f^4
*g^4/(d*x + c)^3 - 3*(b*x + a)*a^4*d^4*f^4*g^4/(d*x + c) + 15*(b*x + a)^2*a
^3*c*d^4*f^4*g^4/(d*x + c)^2 - 15*(b*x + a)^3*a^2*c^2*d^4*f^4*g^4/(d*x + c)
^3 - 10*a^2*b^3*c^3*f^3*g^5 + 12*(b*x + a)*a*b^3*c^4*f^3*g^5/(d*x + c) - 3*
(b*x + a)^2*b^3*c^5*f^3*g^5/(d*x + c)^2 - 30*a^3*b^2*c^2*d*f^3*g^5 + 72*(b*
x + a)*a^2*b^2*c^3*d*f^3*g^5/(d*x + c) - 45*(b*x + a)^2*a*b^2*c^4*d*f^3*g^5
/(d*x + c)^2 + 6*(b*x + a)^3*b^2*c^5*d*f^3*g^5/(d*x + c)^3 - 15*a^4*b*c*d^2
```

```
*f^3*g^5 + 72*(b*x + a)*a^3*b*c^2*d^2*f^3*g^5/(d*x + c) - 90*(b*x + a)^2*a^
2*b*c^3*d^2*f^3*g^5/(d*x + c)^2 + 30*(b*x + a)^3*a*b*c^4*d^2*f^3*g^5/(d*x +
 c)^3 - a^5*d^3*f^3*g^5 + 12*(b*x + a)*a^4*c*d^3*f^3*g^5/(d*x + c) - 30*(b*
x + a)^2*a^3*c^2*d^3*f^3*g^5/(d*x + c)^2 + 20*(b*x + a)^3*a^2*c^3*d^3*f^3*g
^5/(d*x + c)^3 + 10*a^3*b^2*c^3*f^2*g^6 - 18*(b*x + a)*a^2*b^2*c^4*f^2*g^6/
(d*x + c) + 9*(b*x + a)^2*a*b^2*c^5*f^2*g^6/(d*x + c)^2 - (b*x + a)^3*b^2*c
^6*f^2*g^6/(d*x + c)^3 + 15*a^4*b*c^2*d*f^2*g^6 - 48*(b*x + a)*a^3*b*c^3*d*
f^2*g^6/(d*x + c) + 45*(b*x + a)^2*a^2*b*c^4*d*f^2*g^6/(d*x + c)^2 - 12*(b*
x + a)^3*a*b*c^5*d*f^2*g^6/(d*x + c)^3 + 3*a^5*c*d^2*f^2*g^6 - 18*(b*x + a)
*a^4*c^2*d^2*f^2*g^6/(d*x + c) + 30*(b*x + a)^2*a^3*c^3*d^2*f^2*g^6/(d*x +
c)^2 - 15*(b*x + a)^3*a^2*c^4*d^2*f^2*g^6/(d*x + c)^3 - 5*a^4*b*c^3*f*g^7 +
 12*(b*x + a)*a^3*b*c^4*f*g^7/(d*x + c) - 9*(b*x + a)^2*a^2*b*c^5*f*g^7/(d*
x + c)^2 + 2*(b*x + a)^3*a*b*c^6*f*g^7/(d*x + c)^3 - 3*a^5*c^2*d*f*g^7 + 12
*(b*x + a)*a^4*c^3*d*f*g^7/(d*x + c) - 15*(b*x + a)^2*a^3*c^4*d*f*g^7/(d*x
+ c)^2 + 6*(b*x + a)^3*a^2*c^5*d*f*g^7/(d*x + c)^3 + a^5*c^3*g^8 - 3*(b*x +
 a)*a^4*c^4*g^8/(d*x + c) + 3*(b*x + a)^2*a^3*c^5*g^8/(d*x + c)^2 - (b*x +
a)^3*a^2*c^6*g^8/(d*x + c)^3))*(b*c/(b*c - a*d)^2 - a*d/(b*c - a*d)^2)
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{B \ln\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}{\left(gx+f\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^4,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^4,x)
```

maxima [B] time = 1.41, size = 852, normalized size = 3.01

$$\frac{1}{6} \left(\frac{2\, b^{3} \log\left(bx + a\right)}{b^{3} f^{3} g - 3\, a b^{2} f^{2} g^{2} + 3\, a^{2} b f g^{3} - a^{3} g^{4}} - \frac{2\, d^{3} \log\left(dx + c\right)}{d^{3} f^{3} g - 3\, c d^{2} f^{2} g^{2} + 3\, c^{2} d f g^{3} - c^{3} g^{4}} + \frac{}{b^{3} d^{3} f^{6} + a^{3} c^{3} g^{6} - 3 \left(b^{3} c d^{2} + \right.} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x))*B*n - 1/3*B*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n)/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) - 1/3*A/(g
^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

mupad [**B**] time = 9.23, size = 1182, normalized size = 4.18

$$\frac{B\,d^3\,n\,\ln\left(c+d\,x\right)}{3\,c^3\,g^4-9\,c^2\,d\,f\,g^3+9\,c\,d^2\,f^2\,g^2-3\,d^3\,f^3\,g}-\frac{}{3\,a^3\,c^3\,g^6-9\,a^3\,c^2\,d\,f\,g^5+9\,a^3\,c\,d^2\,f^2\,g^4-3\,a^3\,d^3\,f^3\,g^3-9\,a^2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(f + g*x)^4,x)
```

```
[Out] (B*d^3*n*log(c + d*x))/(3*c^3*g^4 - 3*d^3*f^3*g + 9*c*d^2*f^2*g^2 - 9*c^2*d
*f*g^3) - (log(f + g*x)*(g^2*(B*a^3*d^3*n - B*b^3*c^3*n) - g*(3*B*a^2*b*d^3
*f*n - 3*B*b^3*c^2*d*f*n) + 3*B*a*b^2*d^3*f^2*n - 3*B*b^3*c*d^2*f^2*n))/(3*
a^3*c^3*g^6 + 3*b^3*d^3*f^6 - 3*a^3*d^3*f^3*g^3 - 3*b^3*c^3*f^3*g^3 - 9*a^2
*b*c^3*f*g^5 - 9*a*b^2*d^3*f^5*g - 9*a^3*c^2*d*f*g^5 - 9*b^3*c*d^2*f^5*g +
9*a*b^2*c^3*f^2*g^4 + 9*a^2*b*d^3*f^4*g^2 + 9*a^3*c*d^2*f^2*g^4 + 9*b^3*c^2
*d*f^4*g^2 + 27*a*b^2*c*d^2*f^4*g^2 - 27*a*b^2*c^2*d*f^3*g^3 - 27*a^2*b*c*d
^2*f^3*g^3 + 27*a^2*b*c^2*d*f^2*g^4) - (B*log(e*((a + b*x)/(c + d*x))^n))/(
3*g*(f^3 + g^3*x^3 + 3*f^2*g*x + 3*f*g^2*x^2)) - (B*b^3*n*log(a + b*x))/(3*
a^3*g^4 - 3*b^3*f^3*g + 9*a*b^2*f^2*g^2 - 9*a^2*b*f*g^3) - ((2*A*a^2*c^2*g^
4 + 2*A*b^2*d^2*f^4 + 2*A*a^2*d^2*f^2*g^2 + 2*A*b^2*c^2*f^2*g^2 + 3*B*a^2*d
^2*f^2*g^2*n - 3*B*b^2*c^2*f^2*g^2*n - 4*A*a*b*c^2*f*g^3 - 4*A*a*b*d^2*f^3*
g - 4*A*a^2*c*d*f*g^3 - 4*A*b^2*c*d*f^3*g + 8*A*a*b*c*d*f^2*g^2 + B*a*b*c^2
*f*g^3*n - 5*B*a*b*d^2*f^3*g*n - B*a^2*c*d*f*g^3*n + 5*B*b^2*c*d*f^3*g*n)/(
2*(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*g^2 - 2*a*b*c^
2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g + 4*a*b*c*d*f
^2*g^2)) + (x*(B*a*b*c^2*g^4*n - B*a^2*c*d*g^4*n + 5*B*a^2*d^2*f*g^3*n - 5*
B*b^2*c^2*f*g^3*n - 9*B*a*b*d^2*f^2*g^2*n + 9*B*b^2*c*d*f^2*g^2*n))/(2*(a^2
*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*g^2 - 2*a*b*c^2*f*g^
3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g + 4*a*b*c*d*f^2*g^2
)) + (x^2*(B*a^2*d^2*g^4*n - B*b^2*c^2*g^4*n - 2*B*a*b*d^2*f*g^3*n + 2*B*b^
2*c*d*f*g^3*n))/(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*
g^2 - 2*a*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g
 + 4*a*b*c*d*f^2*g^2))/(3*f^3*g + 3*g^4*x^3 + 9*f^2*g^2*x + 9*f*g^3*x^2)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**4,x)
```

```
[Out] Timed out
```

3.66 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^5}\,dx$

Optimal. Leaf size=388

$$-\frac{Bn(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+2b}{4(b}$$

```
[Out] -1/12*B*(-a*d+b*c)*n/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)^3-1/8*B*(-a*d+b*c)*(-a*d
*g-b*c*g+2*b*d*f)*n/(-a*g+b*f)^2/(-c*g+d*f)^2/(g*x+f)^2-1/4*B*(-a*d+b*c)*(a
^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))*n/(-a*g+
b*f)^3/(-c*g+d*f)^3/(g*x+f)+1/4*b^4*B*n*ln(b*x+a)/g/(-a*g+b*f)^4+1/4*(-A-B*
ln(e*((b*x+a)/(d*x+c))^n))/g/(g*x+f)^4-1/4*B*d^4*n*ln(d*x+c)/g/(-c*g+d*f)^4
-1/4*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^
2*g^2-2*c*d*f*g+2*d^2*f^2))*n*ln(g*x+f)/(-a*g+b*f)^4/(-c*g+d*f)^4
```

Rubi [A] time = 0.71, antiderivative size = 388, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 72}

$$-\frac{Bn(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+2b}{4(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^5,x]
```

```
[Out] -(B*(b*c - a*d)*n)/(12*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d
)*(2*b*d*f - b*c*g - a*d*g)*n)/(8*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2)
 - (B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*
c*d*f*g + c^2*g^2))*n)/(4*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*n
*Log[a + b*x])/(4*g*(b*f - a*g)^4) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])
/(4*g*(f + g*x)^4) - (B*d^4*n*Log[c + d*x])/(4*g*(d*f - c*g)^4) - (B*(b*c -
 a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f
^2 - 2*c*d*f*g + c^2*g^2))*n*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^5}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4g(f+gx)^4} + \frac{(Bn)\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \Bigg(\frac{b^5}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5}{(bc-ad)(-df+cg)^4(}}{}$$

$$= -\frac{B(bc-ad)n}{12(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n}{8(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{B(bc-ad}{}$$

Mathematica [A] time = 1.07, size = 359, normalized size = 0.93

$$\frac{Bn(bc-ad)\Bigg(-\frac{g\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(f+gx)(bf-ag)^3(df-cg)^3} - \frac{g\log(f+gx)(adg+bcg-2bdf)\left(a^2d^2g^2-2abd^2fg+b^2\left(c^2g^2-2cdfg+2d^2f^2\right.\right.}{(bf-ag)^4(df-cg)^4}}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^5,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^4) + B*(b*c - a*d)*n*(-
1/3*g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^3) + (g*(-2*b*d*f + b*c*g + a*d*g)
)/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 + a*b*d*g*(
-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)))/((b*f - a*g)^3*(d*f
 - c*g)^3*(f + g*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^4) - (d^
4*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^4) - (g*(-2*b*d*f + b*c*g + a*d*g)
*(-2*a*b*d^2*f*g + a^2*d^2*g^2 + b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log
[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4)))/(4*g)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{\left(gx+f\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^5,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)/(g*x+f)^5,x)
```

maxima [B] time = 1.80, size = 1761, normalized size = 4.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x))*B*n - 1/4*B*log(e*(b*x/(d*x
 + c) + a/(d*x + c))^n)/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*
x + f^4*g) - 1/4*A/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f
^4*g)
```

mupad [B] time = 13.77, size = 2569, normalized size = 6.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))/(f + g*x)^5,x)
```

```
[Out] ((x^3*(B*a^3*d^3*g^6*n - B*b^3*c^3*g^6*n - 3*B*a^2*b*d^3*f*g^5*n + 3*B*b^3*
c^2*d*f*g^5*n + 3*B*a*b^2*d^3*f^2*g^4*n - 3*B*b^3*c*d^2*f^2*g^4*n))/(a^3*c^
3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5
 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*
```

```
f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 +
 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*
a^2*b*c^2*d*f^2*g^4) - (6*A*a^3*c^3*g^6 + 6*A*b^3*d^3*f^6 - 6*A*a^3*d^3*f^3
*g^3 - 6*A*b^3*c^3*f^3*g^3 + 18*A*a*b^2*c^3*f^2*g^4 + 18*A*a^2*b*d^3*f^4*g^
2 + 18*A*a^3*c*d^2*f^2*g^4 + 18*A*b^3*c^2*d*f^4*g^2 - 11*B*a^3*d^3*f^3*g^3*
n + 11*B*b^3*c^3*f^3*g^3*n - 18*A*a^2*b*c^3*f*g^5 - 18*A*a*b^2*d^3*f^5*g -
18*A*a^3*c^2*d*f*g^5 - 18*A*b^3*c*d^2*f^5*g + 2*B*a^2*b*c^3*f*g^5*n - 26*B*
a*b^2*d^3*f^5*g*n - 2*B*a^3*c^2*d*f*g^5*n + 26*B*b^3*c*d^2*f^5*g*n + 54*A*a
*b^2*c*d^2*f^4*g^2 - 54*A*a*b^2*c^2*d*f^3*g^3 - 54*A*a^2*b*c*d^2*f^3*g^3 +
54*A*a^2*b*c^2*d*f^2*g^4 - 7*B*a*b^2*c^3*f^2*g^4*n + 31*B*a^2*b*d^3*f^4*g^2
*n + 7*B*a^3*c*d^2*f^2*g^4*n - 31*B*b^3*c^2*d*f^4*g^2*n + 15*B*a*b^2*c^2*d*
f^3*g^3*n - 15*B*a^2*b*c*d^2*f^3*g^3*n)/(6*(a^3*c^3*g^6 + b^3*d^3*f^6 - a^3
*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5 - 3*a*b^2*d^3*f^5*g - 3*
a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f^2*g^4 + 3*a^2*b*d^3*f^4
*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 -
9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a^2*b*c^2*d*f^2*g^4)) + (
x^2*(B*a*b^2*c^3*g^6*n - B*a^3*c*d^2*g^6*n + 7*B*a^3*d^3*f*g^5*n - 7*B*b^3*
c^3*f*g^5*n + 20*B*a*b^2*d^3*f^3*g^3*n - 21*B*a^2*b*d^3*f^2*g^4*n - 20*B*b^
3*c*d^2*f^3*g^3*n + 21*B*b^3*c^2*d*f^2*g^4*n - 3*B*a*b^2*c^2*d*f*g^5*n + 3*
B*a^2*b*c*d^2*f*g^5*n))/(2*(a^3*c^3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b
^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5
- 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d
^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^
3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a^2*b*c^2*d*f^2*g^4)) + (x*(13*B*a^3*d^3*
f^2*g^4*n - 13*B*b^3*c^3*f^2*g^4*n - B*a^2*b*c^3*g^6*n + B*a^3*c^2*d*g^6*n
+ 5*B*a*b^2*c^3*f*g^5*n - 5*B*a^3*c*d^2*f*g^5*n + 34*B*a*b^2*d^3*f^4*g^2*n
- 38*B*a^2*b*d^3*f^3*g^3*n - 34*B*b^3*c*d^2*f^4*g^2*n + 38*B*b^3*c^2*d*f^3*
g^3*n - 12*B*a*b^2*c^2*d*f^2*g^4*n + 12*B*a^2*b*c*d^2*f^2*g^4*n))/(3*(a^3*c
^3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^
5 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3
*f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2
+ 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9
*a^2*b*c^2*d*f^2*g^4)))/(4*f^4*g + 4*g^5*x^4 + 16*f^3*g^2*x + 16*f*g^4*x^3
+ 24*f^2*g^3*x^2) + (log(f + g*x)*(g*(6*B*a^2*b^2*d^4*f^2*n - 6*B*b^4*c^2*d
^2*f^2*n) - g^2*(4*B*a^3*b*d^4*f*n - 4*B*b^4*c^3*d*f*n) + g^3*(B*a^4*d^4*n
- B*b^4*c^4*n) - 4*B*a*b^3*d^4*f^3*n + 4*B*b^4*c*d^3*f^3*n))/(4*a^4*c^4*g^8
 + 4*b^4*d^4*f^8 + 4*a^4*d^4*f^4*g^4 + 4*b^4*c^4*f^4*g^4 + 24*a^2*b^2*c^4*f
^2*g^6 + 24*a^2*b^2*d^4*f^6*g^2 + 24*a^4*c^2*d^2*f^2*g^6 + 24*b^4*c^2*d^2*f
^6*g^2 - 16*a^3*b*c^4*f*g^7 - 16*a*b^3*d^4*f^7*g - 16*a^4*c^3*d*f*g^7 - 16*
b^4*c*d^3*f^7*g - 16*a*b^3*c^4*f^3*g^5 - 16*a^3*b*d^4*f^5*g^3 - 16*a^4*c*d^
3*f^3*g^5 - 16*b^4*c^3*d*f^5*g^3 + 64*a*b^3*c*d^3*f^6*g^2 + 64*a*b^3*c^3*d*
f^4*g^4 + 64*a^3*b*c*d^3*f^4*g^4 + 64*a^3*b*c^3*d*f^2*g^6 - 96*a*b^3*c^2*d^
2*f^5*g^3 - 96*a^2*b^2*c*d^3*f^5*g^3 - 96*a^2*b^2*c^3*d*f^3*g^5 - 96*a^3*b*
c^2*d^2*f^3*g^5 + 144*a^2*b^2*c^2*d^2*f^4*g^4) - (B*log(e*((a + b*x)/(c + d
*x))^n))/(4*g*(f^4 + g^4*x^4 + 4*f^3*g*x + 4*f*g^3*x^3 + 6*f^2*g^2*x^2)) +
(B*b^4*n*log(a + b*x))/(4*a^4*g^5 + 4*b^4*f^4*g - 16*a*b^3*f^3*g^2 + 24*a^2
*b^2*f^2*g^3 - 16*a^3*b*f*g^4) - (B*d^4*n*log(c + d*x))/(4*c^4*g^5 + 4*d^4*
f^4*g - 16*c*d^3*f^3*g^2 + 24*c^2*d^2*f^2*g^3 - 16*c^3*d*f*g^4)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**5,x)
```

```
[Out] Timed out
```

3.67 $\int (f+gx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=923

$$\frac{B^2g^3n^2\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3n^2\log(c+dx)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3n^2x(bc-ad)^3}{6b^3d^3}+\frac{B^2g^2(4bdf-3bcg-adg)n^2\log}{4b^4d^4}$$

```
[Out] 1/6*B^2*(-a*d+b*c)^3*g^3*n^2*x/b^3/d^3+1/4*B^2*(-a*d+b*c)^2*g^2*(-a*d*g-3*b
*c*g+4*b*d*f)*n^2*x/b^3/d^3+1/12*B^2*(-a*d+b*c)^2*g^3*n^2*(d*x+c)^2/b^2/d^4
-1/2*B*(-a*d+b*c)*g*(a^2*d^2*g^2-2*a*b*d*g*(-c*g+2*d*f)+b^2*(3*c^2*g^2-8*c*
d*f*g+6*d^2*f^2))*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^4/d^3-1/4*B*(
-a*d+b*c)*g^2*(-a*d*g-3*b*c*g+4*b*d*f)*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+
c))^n))/b^2/d^4-1/6*B*(-a*d+b*c)*g^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x+c)
)^n))/b/d^4-1/4*(-a*g+b*f)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^4/g+1/4*(g
*x+f)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/g-1/2*B*(-a*d+b*c)*(-a*d*g-b*c*g+
2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*n*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^4/d^4+1/6*B^2*(-a*
d+b*c)^4*g^3*n^2*ln((b*x+a)/(d*x+c))/b^4/d^4+1/4*B^2*(-a*d+b*c)^3*g^2*(-a*d
*g-3*b*c*g+4*b*d*f)*n^2*ln((b*x+a)/(d*x+c))/b^4/d^4+1/6*B^2*(-a*d+b*c)^4*g^
3*n^2*ln(d*x+c)/b^4/d^4+1/4*B^2*(-a*d+b*c)^3*g^2*(-a*d*g-3*b*c*g+4*b*d*f)*n
^2*ln(d*x+c)/b^4/d^4+1/2*B^2*(-a*d+b*c)^2*g*(a^2*d^2*g^2-2*a*b*d*g*(-c*g+2*
d*f)+b^2*(3*c^2*g^2-8*c*d*f*g+6*d^2*f^2))*n^2*ln(d*x+c)/b^4/d^4-1/2*B^2*(-a
*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*
d*f*g+2*d^2*f^2))*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^4
```

Rubi [A] time = 1.84, antiderivative size = 1060, normalized size of antiderivative = 1.15, number of steps used = 31, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2n^2\log^2(a+bx)(bf-ag)^4}{4b^4g}-\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)(bf-ag)^4}{2b^4g}-\frac{B^2n^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{2b^4g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 -
 4*c*d*f*g + c^2*g^2))*n*x)/(2*b^3*d^3) - (B^2*(b*c - a*d)^2*(b*c + a*d)*g^
3*n^2*x)/(6*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - b*c*g - a*d*g)*n^2
*x)/(4*b^3*d^3) + (B^2*(b*c - a*d)^2*g^3*n^2*x^2)/(12*b^2*d^2) - (a^3*B^2*(
b*c - a*d)*g^3*n^2*Log[a + b*x])/(6*b^4*d) + (a^2*B^2*(b*c - a*d)*g^2*(4*b*
d*f - b*c*g - a*d*g)*n^2*Log[a + b*x])/(4*b^4*d^2) + (B^2*(b*f - a*g)^4*n^2
*Log[a + b*x]^2)/(4*b^4*g) - (B^2*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d
*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n*(a + b*x)*Log[e*((a +
b*x)/(c + d*x))^n])/(2*b^4*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d
*g)*n*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^2*d^2) - (B*(b*c - a
*d)*g^3*n*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) - (B*(b*f - a
*g)^4*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*g) + ((
f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*g) + (B^2*c^3*(b*c
- a*d)*g^3*n^2*Log[c + d*x])/(6*b*d^4) - (B^2*c^2*(b*c - a*d)*g^2*(4*b*d*f
- b*c*g - a*d*g)*n^2*Log[c + d*x])/(4*b^2*d^4) + (B^2*(b*c - a*d)^2*g*(a^2*
d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n^
2*Log[c + d*x])/(2*b^4*d^4) - (B^2*(d*f - c*g)^4*n^2*Log[-((d*(a + b*x))/(b
*c - a*d))]*Log[c + d*x])/(2*d^4*g) + (B*(d*f - c*g)^4*n*(A + B*Log[e*((a +
```

```
 b*x)/(c + d*x))^n])*Log[c + d*x])/(2*d^4*g) + (B^2*(d*f - c*g)^4*n^2*Log[c
 + d*x]^2)/(4*d^4*g) - (B^2*(b*f - a*g)^4*n^2*Log[a + b*x]*Log[(b*(c + d*x)
)/(b*c - a*d)])/(2*b^4*g) - (B^2*(b*f - a*g)^4*n^2*PolyLog[2, -((d*(a + b*x
))/(b*c - a*d))])/(2*b^4*g) - (B^2*(d*f - c*g)^4*n^2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(2*d^4*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{(Bn)\int\frac{(bc-ad)(f+gx)^4\bigl(A+B\,\mathrm{lo}}{(a+bx)(c+d}}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{(B(bc-ad)n)\int\frac{(f+gx)^4\bigl(A+}{(a+}}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{(B(bc-ad)n)\int\Bigl(\frac{g^2\bigl(a^2d^2g^2-}{}}{}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{\left(B(bc-ad)g^3n\right)\int x^2\Bigl(A+}{2bc}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg-\right.\right.}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg-\right.\right.}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg-\right.\right.}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg-\right.\right.}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg-\right.\right.}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg-\right.\right.}{2b^3d^3}$$

Mathematica [A] time = 1.04, size = 757, normalized size = 0.82

$$\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn\Bigl(Bg^4n(bc-ad)\bigl(2a^3d^3\log(a+bx)+bdx(bc-ad)(2ad+2bc-bdx)-2b^3c^3\log(c+dx)\bigr)+6Abdg^2x(bc-a}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*n*(6*A*b*d*(b*c
- a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f
*g + c^2*g^2))*x + 6*B*d*(b*c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c
*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n] + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b^3*d^3*(b*c - a*d)*g^4*x^3*(A + B*Log
```

```
[e*((a + b*x)/(c + d*x))^n]) + 6*d^4*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c - a*d)^2*g^2*(a^2*d^2*g^2 + a*b*d*g*
(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n*Log[c + d*x] - 6*
b^4*(d*f - c*g)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(
b*c - a*d)*g^4*n*(b*d*(b*c - a*d)*x*(2*b*c + 2*a*d - b*d*x) + 2*a^3*d^3*Log
[a + b*x] - 2*b^3*c^3*Log[c + d*x]) - 3*B*(b*c - a*d)*g^3*(-4*b*d*f + b*c*g
 + a*d*g)*n*(-(a^2*d^2*Log[a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c
+ d*x])) - 3*B*d^4*(b*f - a*g)^4*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(
c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 3*b
^4*B*(d*f - c*g)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*
Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*b^4*d^4))/(4*g
)
```

fricas [F] time = 1.33, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\Bigg(e\left(\frac{bx+a}{dx+c}\right)^{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*g^3
*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log(e*((b*x + a)/(d*x + c
))^n)^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*log(e
*((b*x + a)/(d*x + c))^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)^{3} \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((g*x+f)^3*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 5.35, size = 2651, normalized size = 2.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] 1/2*A*B*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*g^3*x^4 +
2*A*B*f*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*f*g^2*x^3 + 3*
A*B*f^2*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*f^2*g*x^2 -
1/12*A*B*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c
```

```
*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^
3)*x)/(b^3*d^3)) + A*B*f*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)
/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A
*B*f^2*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*
d)) + 2*A*B*f^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*f^3*x*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*f^3*x - 1/12*(6*a^3*c*d^3*g^3*n^2 -
 3*(8*c*d^3*f*g^2*n^2 - c^2*d^2*g^3*n^2)*a^2*b + 2*(18*c*d^3*f^2*g*n^2 - 6*
c^2*d^2*f*g^2*n^2 + c^3*d*g^3*n^2)*a*b^2 + (24*c*d^3*f^3*n*log(e) - (11*g^3
*n^2 + 6*g^3*n*log(e))*c^4 + 12*(3*f*g^2*n^2 + 2*f*g^2*n*log(e))*c^3*d - 36
*(f^2*g*n^2 + f^2*g*n*log(e))*c^2*d^2)*b^3)*B^2*log(d*x + c)/(b^3*d^4) + 1/
2*(4*a*b^3*d^4*f^3*n^2 - 6*a^2*b^2*d^4*f^2*g*n^2 + 4*a^3*b*d^4*f*g^2*n^2 -
a^4*d^4*g^3*n^2 - (4*c*d^3*f^3*n^2 - 6*c^2*d^2*f^2*g*n^2 + 4*c^3*d*f*g^2*n^
2 - c^4*g^3*n^2)*b^4)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + di
log(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^
4*log(e)^2 + 6*(4*c*d^3*f^3*n^2 - 6*c^2*d^2*f^2*g*n^2 + 4*c^3*d*f*g^2*n^2 -
 c^4*g^3*n^2)*B^2*b^4*log(b*x + a)*log(d*x + c) - 3*(4*c*d^3*f^3*n^2 - 6*c^
2*d^2*f^2*g*n^2 + 4*c^3*d*f*g^2*n^2 - c^4*g^3*n^2)*B^2*b^4*log(d*x + c)^2 +
 2*(a*b^3*d^4*g^3*n*log(e) - (c*d^3*g^3*n*log(e) - 6*d^4*f*g^2*log(e)^2)*b^
4)*B^2*x^3 + ((g^3*n^2 - 3*g^3*n*log(e))*a^2*b^2*d^4 - 2*(c*d^3*g^3*n^2 - 6
*d^4*f*g^2*n*log(e))*a*b^3 - (12*c*d^3*f*g^2*n*log(e) - 18*d^4*f^2*g*log(e)
^2 - (g^3*n^2 + 3*g^3*n*log(e))*c^2*d^2)*b^4)*B^2*x^2 - 3*(4*a*b^3*d^4*f^3*
n^2 - 6*a^2*b^2*d^4*f^2*g*n^2 + 4*a^3*b*d^4*f*g^2*n^2 - a^4*d^4*g^3*n^2)*B^
2*log(b*x + a)^2 - ((5*g^3*n^2 - 6*g^3*n*log(e))*a^3*b*d^4 - (5*c*d^3*g^3*n
^2 + 12*(f*g^2*n^2 - 2*f*g^2*n*log(e))*d^4)*a^2*b^2 + (24*c*d^3*f*g^2*n^2 -
 5*c^2*d^2*g^3*n^2 - 36*d^4*f^2*g*n*log(e))*a*b^3 + (36*c*d^3*f^2*g*n*log(e
) - 12*d^4*f^3*log(e)^2 + (5*g^3*n^2 + 6*g^3*n*log(e))*c^3*d - 12*(f*g^2*n^
2 + 2*f*g^2*n*log(e))*c^2*d^2)*b^4)*B^2*x + ((11*g^3*n^2 - 6*g^3*n*log(e))*
a^4*d^4 - 2*(c*d^3*g^3*n^2 + 6*(3*f*g^2*n^2 - 2*f*g^2*n*log(e))*d^4)*a^3*b
+ 3*(4*c*d^3*f*g^2*n^2 - c^2*d^2*g^3*n^2 + 12*(f^2*g*n^2 - f^2*g*n*log(e))*
d^4)*a^2*b^2 - 6*(6*c*d^3*f^2*g*n^2 - 4*c^2*d^2*f*g^2*n^2 + c^3*d*g^3*n^2 -
 4*d^4*f^3*n*log(e))*a*b^3)*B^2*log(b*x + a) + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B
^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x)*log((
b*x + a)^n)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^
4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x)*log((d*x + c)^n)^2 + (6*B^2*b^4*d^4*
g^3*x^4*log(e) - 6*(4*c*d^3*f^3*n - 6*c^2*d^2*f^2*g*n + 4*c^3*d*f*g^2*n - c
^4*g^3*n)*B^2*b^4*log(d*x + c) + 2*(a*b^3*d^4*g^3*n - (c*d^3*g^3*n - 12*d^4
*f*g^2*log(e))*b^4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2*n - a^2*b^2*d^4*g^3*n -
(4*c*d^3*f*g^2*n - c^2*d^2*g^3*n - 12*d^4*f^2*g*log(e))*b^4)*B^2*x^2 + 6*(6
*a*b^3*d^4*f^2*g*n - 4*a^2*b^2*d^4*f*g^2*n + a^3*b*d^4*g^3*n - (6*c*d^3*f^2
*g*n - 4*c^2*d^2*f*g^2*n + c^3*d*g^3*n - 4*d^4*f^3*log(e))*b^4)*B^2*x + 6*(
4*a*b^3*d^4*f^3*n - 6*a^2*b^2*d^4*f^2*g*n + 4*a^3*b*d^4*f*g^2*n - a^4*d^4*g
^3*n)*B^2*log(b*x + a))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g^3*x^4*log(e) -
6*(4*c*d^3*f^3*n - 6*c^2*d^2*f^2*g*n + 4*c^3*d*f*g^2*n - c^4*g^3*n)*B^2*b^4
*log(d*x + c) + 2*(a*b^3*d^4*g^3*n - (c*d^3*g^3*n - 12*d^4*f*g^2*log(e))*b^
4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2*n - a^2*b^2*d^4*g^3*n - (4*c*d^3*f*g^2*n
- c^2*d^2*g^3*n - 12*d^4*f^2*g*log(e))*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g*
n - 4*a^2*b^2*d^4*f*g^2*n + a^3*b*d^4*g^3*n - (6*c*d^3*f^2*g*n - 4*c^2*d^2*
f*g^2*n + c^3*d*g^3*n - 4*d^4*f^3*log(e))*b^4)*B^2*x + 6*(4*a*b^3*d^4*f^3*n
 - 6*a^2*b^2*d^4*f^2*g*n + 4*a^3*b*d^4*f*g^2*n - a^4*d^4*g^3*n)*B^2*log(b*x
 + a) + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^
2*g*x^2 + 4*B^2*b^4*d^4*f^3*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^4*d^4
)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.68 $\int (f+gx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=565

$$\frac{2Bn(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d^3}+\frac{2}{}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g^2*n^2*x/b^2/d^2-2/3*B*(-a*d+b*c)*g*(-a*d*g-2*b*c*g+3
*b*d*f)*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^3/d^2-1/3*B*(-a*d+b*c)*
g^2*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b/d^3-1/3*(-a*g+b*f)^3*(A+B
*ln(e*((b*x+a)/(d*x+c))^n))^2/b^3/g+1/3*(g*x+f)^3*(A+B*ln(e*((b*x+a)/(d*x+c
))^n))^2/g+2/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-
3*c*d*f*g+3*d^2*f^2))*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*
x+c))/b^3/d^3+1/3*B^2*(-a*d+b*c)^3*g^2*n^2*ln((b*x+a)/(d*x+c))/b^3/d^3+1/3*
B^2*(-a*d+b*c)^3*g^2*n^2*ln(d*x+c)/b^3/d^3+2/3*B^2*(-a*d+b*c)^2*g*(-a*d*g-2
*b*c*g+3*b*d*f)*n^2*ln(d*x+c)/b^3/d^3+2/3*B^2*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d
*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))*n^2*polylog(2,d*(b*x+a)/
b/(d*x+c))/b^3/d^3
```

Rubi [A] time = 1.15, antiderivative size = 699, normalized size of antiderivative = 1.24, number of steps used = 27, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2n^2(bf-ag)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3g}-\frac{2B^2n^2(df-cg)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3d^3g}+\frac{a^2B^2g^2n^2(bc-ad)\log(a+b}{3b^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*x)/(3*b^2*d^2) + (B^2*(b*
c - a*d)^2*g^2*n^2*x)/(3*b^2*d^2) + (a^2*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*
x])/(3*b^3*d) + (B^2*(b*f - a*g)^3*n^2*Log[a + b*x]^2)/(3*b^3*g) - (2*B^2*(
b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*(a + b*x)*Log[e*((a + b*x)/(c + d*
x))^n])/(3*b^3*d^2) - (B*(b*c - a*d)*g^2*n*x^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(3*b*d) - (2*B*(b*f - a*g)^3*n*Log[a + b*x]*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/(3*b^3*g) + ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2)/(3*g) - (B^2*c^2*(b*c - a*d)*g^2*n^2*Log[c + d*x])/(3*b*d^3) +
 (2*B^2*(b*c - a*d)^2*g*(3*b*d*f - b*c*g - a*d*g)*n^2*Log[c + d*x])/(3*b^3*
d^3) - (2*B^2*(d*f - c*g)^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d
*x])/(3*d^3*g) + (2*B*(d*f - c*g)^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x])/(3*d^3*g) + (B^2*(d*f - c*g)^3*n^2*Log[c + d*x]^2)/(3*d^3*g
) - (2*B^2*(b*f - a*g)^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
3*b^3*g) - (2*B^2*(b*f - a*g)^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))
])/(3*b^3*g) - (2*B^2*(d*f - c*g)^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/(3*d^3*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{(2Bn)\int \frac{(bc-ad)(f+gx)^3\left(A+B}{(a+bx)(c+}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{(2B(bc-ad)n)\int \frac{(f+gx)^3\left(A}{(a}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{(2B(bc-ad)n)\int\left(\frac{g^2(3bdf-}{}\right.}{}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{\left(2B(bc-ad)g^2n\right)\int x\left(A\right.}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{B(bc-ad)g^2nx^2\left(A+\right.}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-}{}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-}{}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2d^2} +$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2d^2} +$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2d^2} +$$

Mathematica [A] time = 0.56, size = 506, normalized size = 0.90

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2-\frac{Bn\left(-Bg^3n(bc-ad)\left(a^2d^2\log(a+bx)-b\left(dx(ad-bc)+bc^2\log(c+dx)\right)\right)-2b^3(df-cg)^3\log(c+dx)\left(B\log\left(e\left(\frac{a}{c}\right.\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*n*(2*A*b*d*(b*c
- a*d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + 2*B*d*(b*c - a*d)*g^2*(3*b*d*f - b
*c*g - a*d*g)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*d^2*(b*c - a*d
)*g^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d^3*(b*f - a*g)^3*Log[
a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*B*(b*c - a*d)^2*g^2*(-3
*b*d*f + b*c*g + a*d*g)*n*Log[c + d*x] - 2*b^3*(d*f - c*g)^3*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[c + d*x] - B*(b*c - a*d)*g^3*n*(a^2*d^2*Log[a
+ b*x] - b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - B*d^3*(b*f - a*g)^3
*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Poly
Log[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b^3*B*(d*f - c*g)^3*n*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/(b^3*d^3))/(3*g)
```

fricas [F] time = 1.15, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2g^2x^2+2\,A^2fgx+A^2f^2+\left(B^2g^2x^2+2\,B^2fgx+B^2f^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\left(ABg^2x^2+2\,ABfgx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*x +
 B^2*f^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x +
 A*B*f^2)*log(e*((b*x + a)/(d*x + c))^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.28, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)^2\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((g*x+f)^2*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 4.83, size = 1659, normalized size = 2.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] 2/3*A*B*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*g^2*x^3 +
2*A*B*f*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*f*g*x^2 + 1/3*A*
B*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*f*g*n*(a^2*log(b*x +
 a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*f^2*n*(a*log(
b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*f^2*x*log(e*(b*x/(d*x + c) + a/(d*x
+ c))^n) + A^2*f^2*x + 1/3*(2*a^2*c*d^2*g^2*n^2 - (6*c*d^2*f*g*n^2 - c^2*d*
g^2*n^2)*a*b - (6*c*d^2*f^2*n*log(e) + (3*g^2*n^2 + 2*g^2*n*log(e))*c^3 - 6
*(f*g*n^2 + f*g*n*log(e))*c^2*d)*b^2)*B^2*log(d*x + c)/(b^2*d^3) + 2/3*(3*a
*b^2*d^3*f^2*n^2 - 3*a^2*b*d^3*f*g*n^2 + a^3*d^3*g^2*n^2 - (3*c*d^2*f^2*n^2
 - 3*c^2*d*f*g*n^2 + c^3*g^2*n^2)*b^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
 - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/3*(B^2*
b^3*d^3*g^2*x^3*log(e)^2 + 2*(3*c*d^2*f^2*n^2 - 3*c^2*d*f*g*n^2 + c^3*g^2*n
^2)*B^2*b^3*log(b*x + a)*log(d*x + c) - (3*c*d^2*f^2*n^2 - 3*c^2*d*f*g*n^2
+ c^3*g^2*n^2)*B^2*b^3*log(d*x + c)^2 + (a*b^2*d^3*g^2*n*log(e) - (c*d^2*g^
2*n*log(e) - 3*d^3*f*g*log(e)^2)*b^3)*B^2*x^2 - (3*a*b^2*d^3*f^2*n^2 - 3*a^
2*b*d^3*f*g*n^2 + a^3*d^3*g^2*n^2)*B^2*log(b*x + a)^2 + ((g^2*n^2 - 2*g^2*n
*log(e))*a^2*b*d^3 - 2*(c*d^2*g^2*n^2 - 3*d^3*f*g*n*log(e))*a*b^2 - (6*c*d^
2*f*g*n*log(e) - 3*d^3*f^2*log(e)^2 - (g^2*n^2 + 2*g^2*n*log(e))*c^2*d)*b^3
)*B^2*x - ((3*g^2*n^2 - 2*g^2*n*log(e))*a^3*d^3 - (c*d^2*g^2*n^2 + 6*(f*g*n
^2 - f*g*n*log(e))*d^3)*a^2*b + 2*(3*c*d^2*f*g*n^2 - c^2*d*g^2*n^2 - 3*d^3*
f^2*n*log(e))*a*b^2)*B^2*log(b*x + a) + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^
3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*g^2*x^3
+ 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x)*log((d*x + c)^n)^2 + (2*B^2*
b^3*d^3*g^2*x^3*log(e) - 2*(3*c*d^2*f^2*n - 3*c^2*d*f*g*n + c^3*g^2*n)*B^2*
b^3*log(d*x + c) + (a*b^2*d^3*g^2*n - (c*d^2*g^2*n - 6*d^3*f*g*log(e))*b^3)
*B^2*x^2 + 2*(3*a*b^2*d^3*f*g*n - a^2*b*d^3*g^2*n - (3*c*d^2*f*g*n - c^2*d*
g^2*n - 3*d^3*f^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d^3*f^2*n - 3*a^2*b*d^3*f
*g*n + a^3*d^3*g^2*n)*B^2*log(b*x + a))*log((b*x + a)^n) - (2*B^2*b^3*d^3*g
^2*x^3*log(e) - 2*(3*c*d^2*f^2*n - 3*c^2*d*f*g*n + c^3*g^2*n)*B^2*b^3*log(d
*x + c) + (a*b^2*d^3*g^2*n - (c*d^2*g^2*n - 6*d^3*f*g*log(e))*b^3)*B^2*x^2
+ 2*(3*a*b^2*d^3*f*g*n - a^2*b*d^3*g^2*n - (3*c*d^2*f*g*n - c^2*d*g^2*n - 3
*d^3*f^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d^3*f^2*n - 3*a^2*b*d^3*f*g*n + a^
3*d^3*g^2*n)*B^2*log(b*x + a) + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*
x^2 + 3*B^2*b^3*d^3*f^2*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^3)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.69 $\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=290

$$\frac{Bn(bc-ad)(-adg-bcg+2bdf)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d^2}-\frac{(bf-ag)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2b^2g}-Bg$$

```
[Out] -B*(-a*d+b*c)*g*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/b^2/d-1/2*(-a*g+b
*f)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b^2/g+1/2*(g*x+f)^2*(A+B*ln(e*((b*x
+a)/(d*x+c))^n))^2/g+B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*n*(A+B*ln(e*((b*x+
a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b^2/d^2+B^2*(-a*d+b*c)^2*g*n^2*ln(
d*x+c)/b^2/d^2+B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*n^2*polylog(2,d*(b*x+a
)/b/(d*x+c))/b^2/d^2
```

Rubi [A] time = 0.83, antiderivative size = 481, normalized size of antiderivative = 1.66, number of steps used = 23, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2n^2(bf-ag)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}-\frac{B^2n^2(df-cg)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2g}-\frac{Bn(bf-ag)^2\log(a+bx)\Bigg(B\log\Bigg(e}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*n*x)/(b*d)) + (B^2*(b*f - a*g)^2*n^2*Log[a + b*x]^2)/(
2*b^2*g) - (B^2*(b*c - a*d)*g*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
b^2*d) - (B*(b*f - a*g)^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(b^2*g) + ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*g
) + (B^2*(b*c - a*d)^2*g*n^2*Log[c + d*x])/(b^2*d^2) - (B^2*(d*f - c*g)^2*n
^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*g) + (B*(d*f - c*g)
^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^2*g) + (B^2*(d
*f - c*g)^2*n^2*Log[c + d*x]^2)/(2*d^2*g) - (B^2*(b*f - a*g)^2*n^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g) - (B^2*(b*f - a*g)^2*n^2*PolyL
og[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g) - (B^2*(d*f - c*g)^2*n^2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
```

```
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(Bn)\int\frac{(bc-ad)(f+gx)^2\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(B(bc-ad)n)\int\frac{(f+gx)^2\left(A+B\log\right.}{(a+bx)(c+}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(B(bc-ad)n)\int\left(\frac{g^2\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{bd}\right.}{}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(B(bc-ad)gn)\int\left(A+B\log\left(\right.\right.}{bd}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B(bf-ag)^2n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^{\right.}\right.\right.}{b^2g}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2d} - \frac{B(bf}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2d} - \frac{B(bf}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2d} - \frac{B(bf}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} + \frac{B^2(bf-ag)^2n^2\log^2(a+bx)}{2b^2g} - \frac{B^2(bc-ad)gn(}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} + \frac{B^2(bf-ag)^2n^2\log^2(a+bx)}{2b^2g} - \frac{B^2(bc-ad)gn(}{}$$

Mathematica [A] time = 0.31, size = 362, normalized size = 1.25

$$\frac{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn\left(-2b^2(df-cg)^2\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2d^2(bf-ag)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*n*(2*A*b*d*(b*c
- a*d)*g^2*x + 2*B*d*(b*c - a*d)*g^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
```

```
n] + 2*d^2*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
) - 2*B*(b*c - a*d)^2*g^2*n*Log[c + d*x] - 2*b^2*(d*f - c*g)^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - B*d^2*(b*f - a*g)^2*n*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) + b^2*B*(d*f - c*g)^2*n*((2*Log[(d*(a + b*x))/(-(b*
c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c -
 a*d)])))/(b^2*d^2))/(2*g)
```

fricas [F] time = 1.37, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABgx + ABf\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log(e*((b*x + a)/(d*x + c))^n)
^2 + 2*(A*B*g*x + A*B*f)*log(e*((b*x + a)/(d*x + c))^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.11, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((g*x+f)*(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [B] time = 5.19, size = 899, normalized size = 3.10

$$ABgx^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{2}A^2gx^2-ABgn\left(\frac{a^2\log\left(bx+a\right)}{b^2}-\frac{c^2\log\left(dx+c\right)}{d^2}+\frac{(bc-ad)x}{bd}\right)+2\,ABfn\bigg($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] A*B*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*g*x^2 - A*B*g*n*
(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B
*f*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*f*x*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n) + A^2*f*x - (a*c*d*g*n^2 + (2*c*d*f*n*log(e) - (g*n^2 +
g*n*log(e))*c^2)*b)*B^2*log(d*x + c)/(b*d^2) + (2*a*b*d^2*f*n^2 - a^2*d^2*g
*n^2 - (2*c*d*f*n^2 - c^2*g*n^2)*b^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
- a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/2*(B^2*b
^2*d^2*g*x^2*log(e)^2 + 2*(2*c*d*f*n^2 - c^2*g*n^2)*B^2*b^2*log(b*x + a)*lo
g(d*x + c) - (2*c*d*f*n^2 - c^2*g*n^2)*B^2*b^2*log(d*x + c)^2 - (2*a*b*d^2*
f*n^2 - a^2*d^2*g*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*g*n*log(e) - (c*d*g*
n*log(e) - d^2*f*log(e)^2)*b^2)*B^2*x + 2*((g*n^2 - g*n*log(e))*a^2*d^2 - (
```

```
c*d*g*n^2 - 2*d^2*f*n*log(e))*a*b)*B^2*log(b*x + a) + (B^2*b^2*d^2*g*x^2 +
2*B^2*b^2*d^2*f*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*
f*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*g*x^2*log(e) - (2*c*d*f*n - c^2*g*
n)*B^2*b^2*log(d*x + c) + (a*b*d^2*g*n - (c*d*g*n - 2*d^2*f*log(e))*b^2)*B^
2*x + (2*a*b*d^2*f*n - a^2*d^2*g*n)*B^2*log(b*x + a))*log((b*x + a)^n) - 2*
(B^2*b^2*d^2*g*x^2*log(e) - (2*c*d*f*n - c^2*g*n)*B^2*b^2*log(d*x + c) + (a
*b*d^2*g*n - (c*d*g*n - 2*d^2*f*log(e))*b^2)*B^2*x + (2*a*b*d^2*f*n - a^2*d
^2*g*n)*B^2*log(b*x + a) + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x)*log((b*x
 + a)^n))*log((d*x + c)^n))/(b^2*d^2)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \left(A + B \log{\left(e \left(\frac{a}{c + dx} + \frac{bx}{c + dx}\right)^{n} \right)}\right)^{2} \left(f + gx\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Integral((A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))**2*(f + g*x), x)
```

3.70 $\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=135

$$\frac{2Bn(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{b}+\frac{2B^2n^2(bc-ad)\mathrm{Li}_2\left(\frac{d(}{b(}\right.}{bd}$$

```
[Out] (b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/b+2*B*(-a*d+b*c)*n*(A+B*ln(e*((b*
x+a)/(d*x+c))^n))*ln((-a*d+b*c)/b/(d*x+c))/b/d+2*B^2*(-a*d+b*c)*n^2*polylog
(2,d*(b*x+a)/b/(d*x+c))/b/d
```

Rubi [B] time = 0.62, antiderivative size = 275, normalized size of antiderivative = 2.04, number of steps used = 20, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {2523, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2aB^2n^2\mathrm{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b}+\frac{2B^2cn^2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d}+\frac{2aBn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b}-\frac{2Bcn}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((a*B^2*n^2*Log[a + b*x]^2)/b) + (2*a*B*n*Log[a + b*x]*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/b + x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (2*B^
2*c*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (2*B*c*n*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/d - (B^2*c*n^2*Log[c + d*x]^
2)/d + (2*a*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (2*a*B
^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b + (2*B^2*c*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/d
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

```
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - (2Bn)\int \frac{(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.\right.}{(a+bx)(c+dx)}$$

$$= x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - (2B(bc-ad)n)\int \frac{x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.\right.}{(a+bx)(c+dx)}$$

$$= x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - (2B(bc-ad)n)\int \left(-\frac{a\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{(bc-ad)(a+bx}\right.$$

$$= x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + (2aBn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx - (2B$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)$$

$$= -\frac{aB^2n^2\log^2(a+bx)}{b} + \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A\right.$$

$$= -\frac{aB^2n^2\log^2(a+bx)}{b} + \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A\right.$$

Mathematica [A] time = 0.17, size = 226, normalized size = 1.67

$$Bn\left(2ad\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right) - 2bc\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right) - aBdn\left(\log(a+bx)\left(1\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*a*d*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b*c*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x] - a*B*d*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*c*n*(
(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])))/(b*d)
```

fricas [F] time = 1.10, size = 0, normalized size = 0.00

$$\text{integral}\left(B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*x
 + c))^n) + A^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.15, size = 0, normalized size = 0.00

$$\int \left(B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,ABn\left(\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)+2\,ABx\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A^{2}x+B^{2}\left(\frac{2\,bcn^{2}\log\left(bx+a\right)\log\left(dx+c\right)-bc}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] 2*A*B*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*x*log(e*((b*x + a)/(d
*x + c))^n) + A^2*x + B^2*((2*b*c*n^2*log(b*x + a)*log(d*x + c) - b*c*n^2*l
og(d*x + c)^2 + b*d*x*log((b*x + a)^n)^2 + b*d*x*log((d*x + c)^n)^2 + 2*(a*
d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x*log(e))*log((b*x + a)^n) - 2*
(a*d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x*log((b*x + a)^n) + b*d*x*l
og(e))*log((d*x + c)^n))/(b*d) - integrate(-(b^2*d*x^2*log(e)^2 + a*b*c*log
(e)^2 - ((2*n*log(e) - log(e)^2)*b^2*c - (2*n*log(e) + log(e)^2)*a*b*d)*x -
 2*(b^2*c*n^2*x + 2*a*b*c*n^2 - a^2*d*n^2)*log(b*x + a))/(b^2*d*x^2 + a*b*c
 + (b^2*c + a*b*d)*x), x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(A + B \log{\left(e \left(\frac{a + bx}{c + dx}\right)^{n} \right)}\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Integral((A + B*log(e*((a + b*x)/(c + d*x))**n))**2, x)
```

3.71 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{f+gx}\,dx$

Optimal. Leaf size=297

$$\frac{2Bn\text{Li}_2\left(\frac{(df-cg)(a+bx)}{(bf-ag)(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}+\frac{\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g}-\frac{2Bn\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right.}{}$$

```
[Out] -(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2*ln((-a*d+b*c)/b/(d*x+c))/g+(A+B*ln(e*((b
*x+a)/(d*x+c))^n))^2*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/g-2*B*n*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))*polylog(2,d*(b*x+a)/b/(d*x+c))/g+2*B*n*(A+B*l
n(e*((b*x+a)/(d*x+c))^n))*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/
g+2*B^2*n^2*polylog(3,d*(b*x+a)/b/(d*x+c))/g-2*B^2*n^2*polylog(3,(-c*g+d*f)
*(b*x+a)/(-a*g+b*f)/(d*x+c))/g
```

Rubi [B] time = 5.18, antiderivative size = 2233, normalized size of antiderivative = 7.52, number of steps used = 43, number of rules used = 21, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.656, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2437, 2435, 2315}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x),x]
```

```
[Out] (-2*A*B*n*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g - (B^2*Log[(a +
 b*x)^n]^2*Log[f + g*x])/g + ((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[
f + g*x])/g + (2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*Log
[f + g*x])/g + (2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[f
 + g*x])/g + (2*A*B*n*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g - (
2*B^2*n*(n*Log[a + b*x] - Log[(a + b*x)^n])*Log[-((g*(c + d*x))/(d*f - c*g)
)]*Log[f + g*x])/g - (B^2*Log[(c + d*x)^(-n)]^2*Log[f + g*x])/g + (2*B^2*n*
Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c +
 d*x))^n] + Log[(c + d*x)^(-n)])*Log[f + g*x])/g - (2*B^2*n*Log[-((g*(c + d
*x))/(d*f - c*g))]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log
[(c + d*x)^(-n)])*Log[f + g*x])/g - (2*B^2*n*Log[-((g*(a + b*x))/(b*f - a*g
))]*(n*Log[c + d*x] + Log[(c + d*x)^(-n)])*Log[f + g*x])/g + (B^2*Log[(a +
b*x)^n]^2*Log[(b*(f + g*x))/(b*f - a*g)])/g + (B^2*Log[(c + d*x)^(-n)]^2*Lo
g[(d*(f + g*x))/(d*f - c*g)])/g + (B^2*n^2*(Log[(b*(c + d*x))/(b*c - a*d)]
+ Log[(b*f - a*g)/(b*(f + g*x))] - Log[((b*f - a*g)*(c + d*x))/((b*c - a*d)
*(f + g*x))])*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]^2)/g
- (B^2*n^2*(Log[(b*(c + d*x))/(b*c - a*d)] - Log[-((g*(c + d*x))/(d*f - c*g
))])*(Log[a + b*x] + Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))
])^2)/g + (B^2*n^2*(Log[-((d*(a + b*x))/(b*c - a*d))] + Log[(d*f - c*g)/(d*
(f + g*x))] - Log[-(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])*Log[
((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]^2)/g - (B^2*n^2*(Log[-((d*
(a + b*x))/(b*c - a*d))] - Log[-((g*(a + b*x))/(b*f - a*g))])*(Log[c + d*x]
 + Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])^2)/g + (2*B^2*n^2*
(Log[f + g*x] - Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/g + (2*B^2*n*Log[(a + b*x)^n]*PolyL
og[2, -((g*(a + b*x))/(b*f - a*g))])/g + (2*B^2*n^2*(Log[f + g*x] - Log[((b
*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/g - (2*B^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, -((g*(c + d*x))/(d*f
 - c*g))])/g - (2*B^2*n^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b
*x)))]*PolyLog[2, (g*(a + b*x))/(b*(f + g*x))])/g + (2*B^2*n^2*Log[-(((b*c
- a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]*PolyLog[2, -(((d*f - c*g)*(a +
```

```
b*x))/((b*c - a*d)*(f + g*x)))])/g - (2*B^2*n^2*Log[((b*c - a*d)*(f + g*x))
/((b*f - a*g)*(c + d*x))]*PolyLog[2, (g*(c + d*x))/(d*(f + g*x))])/g + (2*B
^2*n^2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]*PolyLog[2, ((b*
f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])/g - (2*A*B*n*PolyLog[2, (b*(f
 + g*x))/(b*f - a*g)])/g + (2*B^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c
 + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g
 - (2*B^2*n*(n*Log[c + d*x] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(f + g*x))
/(b*f - a*g)])/g + (2*B^2*n^2*(Log[c + d*x] + Log[((b*c - a*d)*(f + g*x))/(
(b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2*A*B*
n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (2*B^2*n*(n*Log[a + b*x] - Log
[(a + b*x)^n])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (2*B^2*n*(Log[(a
+ b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2
, (d*(f + g*x))/(d*f - c*g)])/g + (2*B^2*n^2*(Log[a + b*x] + Log[-(((b*c -
a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, (d*(f + g*x))/(d*f -
c*g)])/g - (2*B^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/g - (2*B^2*
n^2*PolyLog[3, -((g*(a + b*x))/(b*f - a*g))])/g - (2*B^2*n^2*PolyLog[3, (b*
(c + d*x))/(b*c - a*d)])/g - (2*B^2*n^2*PolyLog[3, -((g*(c + d*x))/(d*f - c
*g))])/g - (2*B^2*n^2*PolyLog[3, (g*(a + b*x))/(b*(f + g*x))])/g + (2*B^2*n
^2*PolyLog[3, -(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (2*B
^2*n^2*PolyLog[3, (g*(c + d*x))/(d*(f + g*x))])/g + (2*B^2*n^2*PolyLog[3, (
(b*f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])/g - (2*B^2*n^2*PolyLog[3,
(b*(f + g*x))/(b*f - a*g)])/g - (2*B^2*n^2*PolyLog[3, (d*(f + g*x))/(d*f -
c*g)])/g
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```

```
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2435

```
Int[(Log[(a_) + (b_.)*(x_)]*Log[(c_) + (d_.)*(x_)])/(x_), x_Symbol] :> Simp
[Log[-((b*x)/a)]*Log[a + b*x]*Log[c + d*x], x] + (Simp[(1*(Log[-((b*x)/a)]
- Log[-(((b*c - a*d)*x)/(a*(c + d*x)))] + Log[(b*c - a*d)/(b*(c + d*x))])*L
og[(a*(c + d*x))/(c*(a + b*x))]^2)/2, x] - Simp[(1*(Log[-((b*x)/a)] - Log[-
((d*x)/c)])*(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])^2)/2, x] + Si
mp[(Log[c + d*x] - Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1 + (b*x)/a
], x] + Simp[(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1
 + (d*x)/c], x] + Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2, (c*(a +
b*x))/(a*(c + d*x))], x] - Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))], x] - Simp[PolyLog[3, 1 + (b*x)/a], x] - Simp
[PolyLog[3, 1 + (d*x)/c], x] + Simp[PolyLog[3, (c*(a + b*x))/(a*(c + d*x))]
, x] - Simp[PolyLog[3, (d*(a + b*x))/(b*(c + d*x))], x]) /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2437

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*Log[(h_.)*((i_.) + (j_.)*(x_))^(m
_.)])/(x_), x_Symbol] :> Dist[m, Int[(Log[i + j*x]*Log[c*(d + e*x)^n])/x, x
], x] - Dist[m*Log[i + j*x] - Log[h*(i + j*x)^m], Int[Log[c*(d + e*x)^n]/x,
 x], x] /; FreeQ[{c, d, e, h, i, j, m, n}, x] && NeQ[e*i - d*j, 0] && NeQ[i
 + j*x, h*(i + j*x)^m]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{f+gx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{a+bx}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+g}{(a+bx)(c+dx)}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad)n)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(}{(a+bx)(c+dx)}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad)n)\int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log}{(bc-ad)(a+bx)}\right.}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2bBn)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{a+bx}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2bBn)\int \left(\frac{A\log(f+gx)}{a+bx} + \frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\log}{a+bx}\right.}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2AbBn)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} - \frac{\left(2bB^2n\right)\int -}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} + 2$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} + 2$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{(A+B}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{(A+B}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{(A+B}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{(A+B}{}$$

Mathematica [B] time = 0.46, size = 1441, normalized size = 4.85

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x),x]
```

```
[Out] (-(B^2*n^2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[((b*f - a*g)*(c + d*x))/((
d*f - c*g)*(a + b*x))]^2) + A^2*Log[f + g*x] - 2*A*B*n*Log[a/b + x]*Log[f +
 g*x] + B^2*n^2*Log[a/b + x]^2*Log[f + g*x] + 2*A*B*n*Log[c/d + x]*Log[f +
g*x] - 2*B^2*n^2*Log[a/b + x]*Log[c/d + x]*Log[f + g*x] + B^2*n^2*Log[c/d +
 x]^2*Log[f + g*x] + 2*A*B*Log[e*((a + b*x)/(c + d*x))^n]*Log[f + g*x] - 2*
B^2*n*Log[a/b + x]*Log[e*((a + b*x)/(c + d*x))^n]*Log[f + g*x] + 2*B^2*n*Lo
g[c/d + x]*Log[e*((a + b*x)/(c + d*x))^n]*Log[f + g*x] + B^2*Log[e*((a + b*
x)/(c + d*x))^n]^2*Log[f + g*x] + 2*A*B*n*Log[a/b + x]*Log[(b*(f + g*x))/(b
*f - a*g)] - B^2*n^2*Log[a/b + x]^2*Log[(b*(f + g*x))/(b*f - a*g)] + 2*B^2*
n*Log[a/b + x]*Log[e*((a + b*x)/(c + d*x))^n]*Log[(b*(f + g*x))/(b*f - a*g)
] + 2*B^2*n^2*Log[a/b + x]*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[(b*(f + g*
x))/(b*f - a*g)] - B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]^2*Log[(b*(f +
g*x))/(b*f - a*g)] + 2*B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((b*f
- a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*Log[(b*(f + g*x))/(b*f - a*g)] -
 B^2*n^2*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]^2*Log[(b*(f +
 g*x))/(b*f - a*g)] - 2*A*B*n*Log[c/d + x]*Log[(d*(f + g*x))/(d*f - c*g)] +
 2*B^2*n^2*Log[a/b + x]*Log[c/d + x]*Log[(d*(f + g*x))/(d*f - c*g)] - B^2*n
^2*Log[c/d + x]^2*Log[(d*(f + g*x))/(d*f - c*g)] - 2*B^2*n*Log[c/d + x]*Log
[e*((a + b*x)/(c + d*x))^n]*Log[(d*(f + g*x))/(d*f - c*g)] - 2*B^2*n^2*Log[
a/b + x]*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[(d*(f + g*x))/(d*f - c*g)] +
 B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]^2*Log[(d*(f + g*x))/(d*f - c*g)]
 - 2*B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((b*f - a*g)*(c + d*x))/
((d*f - c*g)*(a + b*x))]*Log[(d*(f + g*x))/(d*f - c*g)] + B^2*n^2*Log[((b*f
 - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]^2*Log[((-(b*c) + a*d)*(f + g*x)
)/((d*f - c*g)*(a + b*x))] + 2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] +
B*n*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(a
+ b*x))/(-(b*f) + a*g)] - 2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n
*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(c + d
*x))/(-(d*f) + c*g)] - 2*B^2*n^2*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(
a + b*x))]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*n^2*Log[((b*f -
a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*PolyLog[2, ((b*f - a*g)*(c + d*x))
/((d*f - c*g)*(a + b*x))] + 2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)
)] - 2*B^2*n^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])
/g
```

fricas [F] time = 1.23, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^{2}\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2}+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A^{2}}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g*x + f), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.31, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f),x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{A^{2}\log\left(gx+f\right)}{g}+\int \frac{B^{2}\log\left((bx+a)^{n}\right)^{2}+B^{2}\log\left((dx+c)^{n}\right)^{2}+B^{2}\log(e)^{2}+2\,AB\log(e)+2\left(B^{2}\log(e)+AB\right)\mathrm{l}}{gx+f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x, algorithm="maxima")
```

```
[Out] A^2*log(g*x + f)/g + integrate((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^
n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log(e) + A*B)*log((b*x + a)^n)
- 2*(B^2*log((b*x + a)^n) + B^2*log(e) + A*B)*log((d*x + c)^n))/(g*x + f),
x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^{n}\right)\right)}^{2}}{f+g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x),x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)\right)^{2}}{f+gx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f),x)
```

```
[Out] Integral((A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))**2/(f + g*x), x)
```

3.72 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^2}\,dx$

Optimal. Leaf size=206

$$\frac{2Bn(bc-ad)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{(bf-ag)(df-cg)}+\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{(f+gx)(bf-ag)}+\frac{2B^2n^2(bc-a}{(bf-}$$

```
[Out] (b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(-a*g+b*f)/(g*x+f)+2*B*(-a*d+b*c)
*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+
c))/(-a*g+b*f)/(-c*g+d*f)+2*B^2*(-a*d+b*c)*n^2*polylog(2,(-c*g+d*f)*(b*x+a)
/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)/(-c*g+d*f)
```

Rubi [B] time = 1.13, antiderivative size = 657, normalized size of antiderivative = 3.19, number of steps used = 29, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2bB^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g(bf-ag)}+\frac{2B^2dn^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g(df-cg)}-\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{(bf-ag)(df-cg)}+\frac{2B^2n^2(bc-}{(b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^2,x]
```

```
[Out] -((b*B^2*n^2*Log[a + b*x]^2)/(g*(b*f - a*g))) + (2*b*B*n*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(g*(b*f - a*g)) - (A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2/(g*(f + g*x)) + (2*B^2*d*n^2*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[c + d*x])/(g*(d*f - c*g)) - (2*B*d*n*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c + d*x])/(g*(d*f - c*g)) - (B^2*d*n^2*Log[c + d*x]^2)/(g*(
d*f - c*g)) + (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*
(b*f - a*g)) - (2*B^2*(b*c - a*d)*n^2*Log[-((g*(a + b*x))/(b*f - a*g))]*Log
[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (2*B*(b*c - a*d)*n*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(b*c
 - a*d)*n^2*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)*(d
*f - c*g)) + (2*b*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f
 - a*g)) + (2*B^2*d*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*
g)) - (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f -
 a*g)*(d*f - c*g)) + (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (d*(f + g*x))/(d*f -
 c*g)])/((b*f - a*g)*(d*f - c*g))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^2}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad)n)\int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2(A+}{(bc-ad}\right.}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{\left(2b^2Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{g(bf-ag)} - \frac{\left(2Bd^2n\right)\int \frac{A+}{}}{g(d}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} - \frac{2B}{}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} - \frac{2B}{}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} - \frac{2B}{}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{2B}{}$$

$$= -\frac{bB^2n^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\right.}{}$$

$$= -\frac{bB^2n^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\right.}{}$$

Mathematica [B] time = 0.52, size = 418, normalized size = 2.03

$$\frac{Bn\left(2b\log(a+bx)(df-cg)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-2d(bf-ag)\log(c+dx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+2g(bc-ad)\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-bBn(df-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)) + (B*n*(2*b*(d*f - c
*g)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(b*f - a*g)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*(b*c - a*d)*g*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x] - b*B*(d*f - c*g)*n*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) + B*d*(b*f - a*g)*n*((2*Log[(d*(a + b*x))/(-(b*c)
```

```
 + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]) - 2*B*(b*c - a*d)*g*n*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c
 + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*
g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)*(d*f - c*g)))/g
```

fricas [F] time = 1.41, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^{2}\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2}+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A^{2}}{g^{2}x^{2}+2\,fgx+f^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^2*x^2 + 2*f*g*x + f^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(gx+f\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^2,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,ABn\left(\frac{b\log\left(bx+a\right)}{bfg-ag^{2}}-\frac{d\log\left(dx+c\right)}{dfg-cg^{2}}+\frac{\left(bc-ad\right)\log\left(gx+f\right)}{bdf^{2}+acg^{2}-\left(bc+ad\right)fg}\right)-B^{2}\Bigg(\frac{\log\left(\left(dx+c\right)^{n}\right)^{2}}{g^{2}x+fg}+\int-\frac{dgx\log(e)^{2}+c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x, algorithm="maxima
")
```

```
[Out] 2*A*B*n*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) +
(b*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g)) - B^2*(log(
(d*x + c)^n)^2/(g^2*x + f*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 +
(d*g*x + c*g)*log((b*x + a)^n)^2 + 2*(d*g*x*log(e) + c*g*log(e))*log((b*x +
 a)^n) + 2*(d*f*n + (g*n - g*log(e))*d*x - c*g*log(e) - (d*g*x + c*g)*log((
b*x + a)^n))*log((d*x + c)^n))/(d*g^3*x^3 + c*f^2*g + (2*d*f*g^2 + c*g^3)*x
^2 + (d*f^2*g + 2*c*f*g^2)*x), x)) - 2*A*B*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n)/(g^2*x + f*g) - A^2/(g^2*x + f*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(f+g\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^2,x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B \log{\left(e \left(\frac{a}{c + d x} + \frac{b x}{c + d x}\right)^{n} \right)}\right)^{2}}{\left(f + g x\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**2,x)
```

```
[Out] Integral((A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))**2/(f + g*x)**2, x
)
```

3.73 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^3}\,dx$

Optimal. Leaf size=389

$$\frac{b^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g(bf-ag)^2}+\frac{Bgn(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{(f+gx)(bf-ag)^2(df-cg)}+\frac{Bn(bc-ad)(-adg-bcg+2bdf)\,\mathrm{lo}}{(bf-}$$

```
[Out] B*(-a*d+b*c)*g*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*g+b*f)^2/(-c*g
+d*f)/(g*x+f)+1/2*b^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/g/(-a*g+b*f)^2-1/2*
(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/g/(g*x+f)^2+B^2*(-a*d+b*c)^2*g*n^2*ln((g*
x+f)/(d*x+c))/(-a*g+b*f)^2/(-c*g+d*f)^2+B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)
*n*(A+B*ln(e*((b*x+a)/(d*x+c))^n))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+
c))/(-a*g+b*f)^2/(-c*g+d*f)^2+B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*n^2*pol
ylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^2/(-c*g+d*f)^2
```

Rubi [B] time = 1.56, antiderivative size = 941, normalized size of antiderivative = 2.42, number of steps used = 33, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2n^2\log^2(a+bx)b^2}{2g(bf-ag)^2}+\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^2}{g(bf-ag)^2}+\frac{B^2n^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^2}{g(bf-ag)^2}+\frac{B^2n^2\mathrm{PolyL}}{g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^3,x]
```

```
[Out] (b*B^2*(b*c - a*d)*n^2*Log[a + b*x])/((b*f - a*g)^2*(d*f - c*g)) - (b^2*B^2
*n^2*Log[a + b*x]^2)/(2*g*(b*f - a*g)^2) - (B*(b*c - a*d)*n*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/((b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*n*Log
[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(g*(b*f - a*g)^2) - (A +
B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*g*(f + g*x)^2) - (B^2*d*(b*c - a*d)*
n^2*Log[c + d*x])/((b*f - a*g)*(d*f - c*g)^2) + (B^2*d^2*n^2*Log[-((d*(a +
b*x))/(b*c - a*d))]*Log[c + d*x])/(g*(d*f - c*g)^2) - (B*d^2*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(g*(d*f - c*g)^2) - (B^2*d^2*n^2*L
og[c + d*x]^2)/(2*g*(d*f - c*g)^2) + (b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c +
d*x))/(b*c - a*d)])/(g*(b*f - a*g)^2) + (B^2*(b*c - a*d)^2*g*n^2*Log[f + g*
x])/((b*f - a*g)^2*(d*f - c*g)^2) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d
*g)*n^2*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)^2*(d*f
 - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n*(A + B*Log[e*((a +
b*x)/(c + d*x))^n])*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (B^2*(b*c
 - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[-((g*(c + d*x))/(d*f - c*g))]*Log
[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (b^2*B^2*n^2*PolyLog[2, -((d*(a
+ b*x))/(b*c - a*d))])/(g*(b*f - a*g)^2) + (B^2*d^2*n^2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/(g*(d*f - c*g)^2) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*n^2*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)^2*(d*f - c*
g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*PolyLog[2, (d*(f + g
*x))/(d*f - c*g)])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(\frac{a+bx}{c+dx})^n))^2}{(f+gx)^3}\,dx = -\frac{(A+B\log(e(\frac{a+bx}{c+dx})^n))^2}{2g(f+gx)^2} + \frac{(Bn)\int \frac{(bc-ad)(A+B\log(e(\frac{a+bx}{c+dx})^n))}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{(A+B\log(e(\frac{a+bx}{c+dx})^n))^2}{2g(f+gx)^2} + \frac{(B(bc-ad)n)\int \frac{A+B\log(e(\frac{a+bx}{c+dx})^n)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{(A+B\log(e(\frac{a+bx}{c+dx})^n))^2}{2g(f+gx)^2} + \frac{(B(bc-ad)n)\int (\frac{b^3(A+B\log(e(\frac{a+bx}{c+dx})^n))}{(bc-ad)(bf-ag)^2(a+bx)} - \frac{d^3(A+B\log(}{(bc-ad)(-df+}}{}$$

$$= -\frac{(A+B\log(e(\frac{a+bx}{c+dx})^n))^2}{2g(f+gx)^2} + \frac{(b^3Bn)\int \frac{A+B\log(e(\frac{a+bx}{c+dx})^n)}{a+bx}\,dx}{g(bf-ag)^2} - \frac{(Bd^3n)\int \frac{A+B\log(}{c+}}{g(df-cg}$$

$$= -\frac{B(bc-ad)n(A+B\log(e(\frac{a+bx}{c+dx})^n))}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2Bn\log(a+bx)(A+B\log(e(\frac{a+bx}{c+dx}}{g(bf-ag)^2}$$

$$= -\frac{B(bc-ad)n(A+B\log(e(\frac{a+bx}{c+dx})^n))}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2Bn\log(a+bx)(A+B\log(e(\frac{a+bx}{c+dx}}{g(bf-ag)^2}$$

$$= -\frac{B(bc-ad)n(A+B\log(e(\frac{a+bx}{c+dx})^n))}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2Bn\log(a+bx)(A+B\log(e(\frac{a+bx}{c+dx}}{g(bf-ag)^2}$$

$$= \frac{bB^2(bc-ad)n^2\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{B(bc-ad)n(A+B\log(e(\frac{a+bx}{c+dx})^n))}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2Bn\log}{}$$

$$= \frac{bB^2(bc-ad)n^2\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{b^2B^2n^2\log^2(a+bx)}{2g(bf-ag)^2} - \frac{B(bc-ad)n(A+B\log(}{(bf-ag)(df-cg)(f}$$

$$= \frac{bB^2(bc-ad)n^2\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{b^2B^2n^2\log^2(a+bx)}{2g(bf-ag)^2} - \frac{B(bc-ad)n(A+B\log(}{(bf-ag)(df-cg)(f}$$

Mathematica [A] time = 1.65, size = 615, normalized size = 1.58

$$-\frac{\frac{Bn(f+gx)(-2b^2(f+gx)\log(a+bx)(df-cg)^2(B\log(e(\frac{a+bx}{c+dx})^n)+A)+2d^2(f+gx)(bf-ag)^2\log(c+dx)(B\log(e(\frac{a+bx}{c+dx})^n)+A)+2g(bc-ad)(bf-ag)(df-cg)(B}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^3,x]
```

```
[Out] -1/2*((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(f + g*x)*(2*(b*c - a
*d)*g*(b*f - a*g)*(d*f - c*g)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b^
2*(d*f - c*g)^2*(f + g*x)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]) + 2*d^2*(b*f - a*g)^2*(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*L
og[c + d*x] + 2*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*L
og[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x] - 2*B*(b*c - a*d)*g*n*(f + g*x)
*(b*(d*f - c*g)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d
)*g*Log[f + g*x]) + b^2*B*(d*f - c*g)^2*n*(f + g*x)*(Log[a + b*x]*(Log[a +
b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*
c) + a*d)]) - B*d^2*(b*f - a*g)^2*n*(f + g*x)*((2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]) - 2*B*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*n*(f + g*x)*((Log[(g*(
a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x]
 + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f -
c*g)])))/((b*f - a*g)^2*(d*f - c*g)^2))/(g*(f + g*x)^2)
```

fricas [**F**] time = 0.80, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^{2}\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2}+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A^{2}}{g^{3}x^{3}+3\,fg^{2}x^{2}+3\,f^{2}gx+f^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^3*x^3 + 3*f*g^2*x^2 + 3*f^2*g*x + f^3), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**F**] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(gx+f\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^3,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^3,x)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\left(\frac{b^{2}\log\left(bx+a\right)}{b^{2}f^{2}g-2\,abfg^{2}+a^{2}g^{3}}-\frac{d^{2}\log\left(dx+c\right)}{d^{2}f^{2}g-2\,cdfg^{2}+c^{2}g^{3}}+\frac{\left(2\left(b^{2}cd-abd^{2}\right)f-\left(b^{2}c^{2}-a^{2}d^{2}\right)g}{b^{2}d^{2}f^{4}+a^{2}c^{2}g^{4}-2\left(b^{2}cd+abd^{2}\right)f^{3}g+\left(b^{2}c^{2}+4\,abcd}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x, algorithm="maxima
")
```

```
[Out] (b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c)/(d
^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2 - a
^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d^2)*
f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)*f*g
^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g + a
*c*g^3 - (b*c + a*d)*f*g^2)*x))*A*B*n - 1/2*B^2*(log((d*x + c)^n)^2/(g^3*x^
2 + 2*f*g^2*x + f^2*g) + 2*integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + (d*g
*x + c*g)*log((b*x + a)^n)^2 + 2*(d*g*x*log(e) + c*g*log(e))*log((b*x + a)^
n) + (d*f*n + (g*n - 2*g*log(e))*d*x - 2*c*g*log(e) - 2*(d*g*x + c*g)*log((
b*x + a)^n))*log((d*x + c)^n))/(d*g^4*x^4 + c*f^3*g + (3*d*f*g^3 + c*g^4)*x
^3 + 3*(d*f^2*g^2 + c*f*g^3)*x^2 + (d*f^3*g + 3*c*f^2*g^2)*x), x)) - A*B*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(g^3*x^2 + 2*f*g^2*x + f^2*g) - 1/2*A^
2/(g^3*x^2 + 2*f*g^2*x + f^2*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}{\left(f+g\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^3,x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**3,x)
```

```
[Out] Timed out
```

3.74 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^4}\,dx$

Optimal. Leaf size=747

$$\frac{2Bn(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{3(bf-ag)^3(df-cg)^3}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g^2*n^2*(d*x+c)/(-a*g+b*f)^2/(-c*g+d*f)^3/(g*x+f)-1/3*
B*(-a*d+b*c)*g^2*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*g+b*f)/(-c
*g+d*f)^3/(g*x+f)^2+2/3*B*(-a*d+b*c)*g*(-2*a*d*g-b*c*g+3*b*d*f)*n*(b*x+a)*(
A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*g+b*f)^3/(-c*g+d*f)^2/(g*x+f)+1/3*b^3*(A
+B*ln(e*((b*x+a)/(d*x+c))^n))^2/g/(-a*g+b*f)^3-1/3*(A+B*ln(e*((b*x+a)/(d*x+
c))^n))^2/g/(g*x+f)^3+1/3*B^2*(-a*d+b*c)^3*g^2*n^2*ln((b*x+a)/(d*x+c))/(-a*
g+b*f)^3/(-c*g+d*f)^3-1/3*B^2*(-a*d+b*c)^3*g^2*n^2*ln((g*x+f)/(d*x+c))/(-a*
g+b*f)^3/(-c*g+d*f)^3+2/3*B^2*(-a*d+b*c)^2*g*(-2*a*d*g-b*c*g+3*b*d*f)*n^2*l
n((g*x+f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3+2/3*B*(-a*d+b*c)*(a^2*d^2*g^2-
a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))*n*(A+B*ln(e*((b*x+a
)/(d*x+c))^n))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^3/(-c
*g+d*f)^3+2/3*B^2*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2
-3*c*d*f*g+3*d^2*f^2))*n^2*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))
/(-a*g+b*f)^3/(-c*g+d*f)^3
```

Rubi [A] time = 2.50, antiderivative size = 1427, normalized size of antiderivative = 1.91, number of steps used = 37, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2n^2\log^2(a+bx)b^3}{3g(bf-ag)^3}+\frac{2Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^3}{3g(bf-ag)^3}+\frac{2B^2n^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^3}{3g(bf-ag)^3}+\frac{2B^2n}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^4,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g*n^2)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^2
*B^2*(b*c - a*d)*n^2*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)) + (2*b*B^2
*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[a + b*x])/(3*(b*f - a*g)^3*(
d*f - c*g)^2) - (b^3*B^2*n^2*Log[a + b*x]^2)/(3*g*(b*f - a*g)^3) - (B*(b*c
- a*d)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*f - a*g)*(d*f - c*g)
*(f + g*x)^2) - (2*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*b^
3*B*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*g*(b*f - a*g)
^3) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(3*g*(f + g*x)^3) - (B^2*d^2
*(b*c - a*d)*n^2*Log[c + d*x])/(3*(b*f - a*g)*(d*f - c*g)^3) - (2*B^2*d*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[c + d*x])/(3*(b*f - a*g)^2*(d*f
- c*g)^3) + (2*B^2*d^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/
(3*g*(d*f - c*g)^3) - (2*B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log
[c + d*x])/(3*g*(d*f - c*g)^3) - (B^2*d^3*n^2*Log[c + d*x]^2)/(3*g*(d*f - c
*g)^3) + (2*b^3*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*g*(
b*f - a*g)^3) + (B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[f +
g*x])/((b*f - a*g)^3*(d*f - c*g)^3) - (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b
*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[-((g*(a
 + b*x))/(b*f - a*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
```

```
f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x])/(3*(
b*f - a*g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*
d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[-((g*(c + d*x))
/(d*f - c*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*b^3*B^2*n
^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*g*(b*f - a*g)^3) + (2*B^2*d
^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*g*(d*f - c*g)^3) - (2*B^2*
(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f
*g + c^2*g^2))*n^2*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/(3*(b*f - a*g)^3*
(d*f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*PolyLog[2, (d*(f + g*x))/(d*f -
c*g)])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^4}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{(2B(bc-ad)n)\int \left(\frac{b^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)^3(a+bx)} + \frac{d^4\left(A+B\log\right.}{(bc-ad)(-d}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{\left(2b^4Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{3g(bf-ag)^3} - \frac{\left(2Bd^4n\right)\int \frac{A+B\log}{}}{3g(df-}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)n\left(A+\right.}{3(bf-ag)^2(df-cg)^2(f}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)n\left(A+\right.}{3(bf-ag)^2(df-cg)^2(f}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)n\left(A+\right.}{3(bf-ag)^2(df-cg)^2(f}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)n^2\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-a}{}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)n^2\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-a}{}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)n^2\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-a}{}$$

Mathematica [**A**] time = 3.71, size = 918, normalized size = 1.23

$$-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{Bn(f+gx)\left(2d^3(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)(bf-ag)^3 - Bd^3n(f+gx)^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^4,x]
```

```
[Out] -1/3*((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(f + g*x)*((b*c - a*d
)*g*(b*f - a*g)^2*(d*f - c*g)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*
(b*c - a*d)*g*(b*f - a*g)*(-(d*f) + c*g)*(-2*b*d*f + b*c*g + a*d*g)*(f + g*
x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b^3*(d*f - c*g)^3*(f + g*x)^2
*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d^3*(b*f - a*g)^3*
(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*(b*c -
```

```
a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g +
 c^2*g^2))*(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x]
- 2*B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*n*(f + g*x)^2*(b*(d*f - c*g)*
Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]
) + B*(b*c - a*d)*g*n*(f + g*x)*((b*c - a*d)*g*(b*f - a*g)*(d*f - c*g) - b^
2*(d*f - c*g)^2*(f + g*x)*Log[a + b*x] + d^2*(b*f - a*g)^2*(f + g*x)*Log[c
+ d*x] + (b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*Log[f + g*x]) +
 b^3*B*(d*f - c*g)^3*n*(f + g*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(
c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - B*d
^3*(b*f - a*g)^3*n*(f + g*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*B*(b*
c - a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f
*g + c^2*g^2))*n*(f + g*x)^2*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(
c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a
*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)^3*(d*f - c*g)^
3))/(g*(f + g*x)^3)
```

fricas **[F]** time = 1.19, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^{2} \log\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2} + 2\, AB \log\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A^{2}}{g^{4} x^{4} + 4\, f g^{3} x^{3} + 6\, f^{2} g^{2} x^{2} + 4\, f^{3} g x + f^{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^4*x^4 + 4*f*g^3*x^3 + 6*f^2*g^2*x^2 + 4*f^3*g*x + f^4)
, x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[F]** time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\left(B \ln\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}{\left(gx+f\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^4,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^4,x)
```

maxima **[F]** time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x, algorithm="maxima
")
```

```
[Out] 1/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x))*A*B*n - 1/3*B^2*(log((d*x + c)^n
)^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) + 3*integrate(-1/3*(3*d*g
*x*log(e)^2 + 3*c*g*log(e)^2 + 3*(d*g*x + c*g)*log((b*x + a)^n)^2 + 6*(d*g*
x*log(e) + c*g*log(e))*log((b*x + a)^n) + 2*(d*f*n + (g*n - 3*g*log(e))*d*x
 - 3*c*g*log(e) - 3*(d*g*x + c*g)*log((b*x + a)^n))*log((d*x + c)^n))/(d*g^
5*x^5 + c*f^4*g + (4*d*f*g^4 + c*g^5)*x^4 + 2*(3*d*f^2*g^3 + 2*c*f*g^4)*x^3
 + 2*(2*d*f^3*g^2 + 3*c*f^2*g^3)*x^2 + (d*f^4*g + 4*c*f^3*g^2)*x), x)) - 2/
3*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2
*g^2*x + f^3*g) - 1/3*A^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)^2}{{\left(f+g\,x\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^4,x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^4, x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**4,x)
```

```
[Out] Timed out
```

3.75 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^5}\,dx$

Optimal. Leaf size=1208

$$\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 b^4}{4g(bf-ag)^4}-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4}+\frac{B(bc-ad)g\left(\left(6d^2f^2-4cdgf+c^2g^2\right)b^2-2adg(4df-}{2(bf-ag)^4(df}$$

```
[Out] -1/12*B^2*(-a*d+b*c)^2*g^3*n^2*(d*x+c)^2/(-a*g+b*f)^2/(-c*g+d*f)^4/(g*x+f)^
2-1/6*B^2*(-a*d+b*c)^3*g^3*n^2*(d*x+c)/(-a*g+b*f)^3/(-c*g+d*f)^4/(g*x+f)+1/
4*B^2*(-a*d+b*c)^2*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*n^2*(d*x+c)/(-a*g+b*f)^3/(-
c*g+d*f)^4/(g*x+f)+1/6*B*(-a*d+b*c)*g^3*n*(d*x+c)^3*(A+B*ln(e*((b*x+a)/(d*x
+c))^n))/(-a*g+b*f)/(-c*g+d*f)^4/(g*x+f)^3-1/4*B*(-a*d+b*c)*g^2*(-3*a*d*g-b
*c*g+4*b*d*f)*n*(d*x+c)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))/(-a*g+b*f)^2/(-c*
g+d*f)^4/(g*x+f)^2+1/2*B*(-a*d+b*c)*g*(3*a^2*d^2*g^2-2*a*b*d*g*(-c*g+4*d*f)
+b^2*(c^2*g^2-4*c*d*f*g+6*d^2*f^2))*n*(b*x+a)*(A+B*ln(e*((b*x+a)/(d*x+c))^n
))/(-a*g+b*f)^4/(-c*g+d*f)^3/(g*x+f)+1/4*b^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n)
)^2/g/(-a*g+b*f)^4-1/4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/g/(g*x+f)^4-1/6*B^
2*(-a*d+b*c)^4*g^3*n^2*ln((b*x+a)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4+1/4*B^
2*(-a*d+b*c)^3*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*n^2*ln((b*x+a)/(d*x+c))/(-a*g+b
*f)^4/(-c*g+d*f)^4+1/6*B^2*(-a*d+b*c)^4*g^3*n^2*ln((g*x+f)/(d*x+c))/(-a*g+b
*f)^4/(-c*g+d*f)^4-1/4*B^2*(-a*d+b*c)^3*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*n^2*ln
((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4+1/2*B^2*(-a*d+b*c)^2*g*(3*a^2*d
^2*g^2-2*a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*g+6*d^2*f^2))*n^2*ln((g*
x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-1/2*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*
d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*n*(A+B*l
n(e*((b*x+a)/(d*x+c))^n))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g
+b*f)^4/(-c*g+d*f)^4-1/2*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f
*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*n^2*polylog(2,(-c*g+d*f)*
(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4
```

Rubi [A] time = 3.55, antiderivative size = 1968, normalized size of antiderivative = 1.63, number of steps used = 41, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g*n^2)/(12*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (
5*B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)*n^2)/(12*(b*f - a*g)^3*(d*f
 - c*g)^3*(f + g*x)) + (b^3*B^2*(b*c - a*d)*n^2*Log[a + b*x])/(6*(b*f - a*g
)^4*(d*f - c*g)) + (b^2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[a
 + b*x])/(4*(b*f - a*g)^4*(d*f - c*g)^2) + (b*B^2*(b*c - a*d)*(a^2*d^2*g^2
- a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[a
+ b*x])/(2*(b*f - a*g)^4*(d*f - c*g)^3) - (b^4*B^2*n^2*Log[a + b*x]^2)/(4*g
*(b*f - a*g)^4) - (B*(b*c - a*d)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*f - a*g)^2*(d*f - c
*g)^2*(f + g*x)^2) - (B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(2*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*n*Log[a + b*x]*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*g*(b*f - a*g)^4) - (A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2/(4*g*(f + g*x)^4) - (B^2*d^3*(b*c - a*d)*n^2*Log[c
 + d*x])/(6*(b*f - a*g)*(d*f - c*g)^4) - (B^2*d^2*(b*c - a*d)*(2*b*d*f - b*
```

```
c*g - a*d*g)*n^2*Log[c + d*x])/(4*(b*f - a*g)^2*(d*f - c*g)^4) - (B^2*d*(b*
c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g
+ c^2*g^2))*n^2*Log[c + d*x])/(2*(b*f - a*g)^3*(d*f - c*g)^4) + (B^2*d^4*n^
2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*g*(d*f - c*g)^4) - (B*
d^4*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(2*g*(d*f - c*g)
^4) - (B^2*d^4*n^2*Log[c + d*x]^2)/(4*g*(d*f - c*g)^4) + (b^4*B^2*n^2*Log[a
 + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*g*(b*f - a*g)^4) + (B^2*(b*c - a
*d)^2*g*(2*b*d*f - b*c*g - a*d*g)^2*n^2*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f
 - c*g)^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[f + g*x])/(3*(b*f - a*g)^4*(
d*f - c*g)^4) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g -
 a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n^2*Log[-((g*(a + b*x
))/(b*f - a*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c -
a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^
2 - 2*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[f +
g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2
))*n^2*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*
f - c*g)^4) + (b^4*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*g*(
b*f - a*g)^4) + (B^2*d^4*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*g*(d
*f - c*g)^4) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g -
a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n^2*PolyLog[2, (b*(f +
 g*x))/(b*f - a*g)])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*
b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*
d*f*g + c^2*g^2))*n^2*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/(2*(b*f - a*g)
^4*(d*f - c*g)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^5}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \left(\frac{b^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5\left(A+B\log\right.}{(bc-ad)(-df+}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{\left(b^5Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{2g(bf-ag)^4} - \frac{\left(Bd^5n\right)\int \frac{A+B\log\left(\right.}{c+}}{2g(df-c}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n\left(A+\right.}{4(bf-ag)^2(df-cg)^2(f+}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n\left(A+\right.}{4(bf-ag)^2(df-cg)^2(f+}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n\left(A+\right.}{4(bf-ag)^2(df-cg)^2(f+}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)n^2}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3}{}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)n^2}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3}{}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)n^2}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3}{}$$

Mathematica [A] time = 7.32, size = 1476, normalized size = 1.22

$$\frac{B(bc-ad)n\left(\frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^4}{(bc-ad)(bf-ag)^4} - \frac{Bn\left(\log^2(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a+bx)-2\text{Li}_2\left(-\frac{d(a+bx)}{bc-ad}\right)\right)b^4}{2(bc-ad)(bf-ag)^4} - \frac{g\left(\left(3d^2f^2-3cdgf+c^2g^2\right)b^2-a\right.}{(bf-}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^5,x]
```

```
[Out] -1/4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(g*(f + g*x)^4) + (B*(b*c - a
*d)*n*(-1/3*(g*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*f - a*g)*(d*f -
c*g)*(f + g*x)^3) - (g*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2
 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Lo
```

```
g[e*((a + b*x)/(c + d*x))^n]))/((b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b
^4*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*(b*f -
 a*g)^4) - (d^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c
- a*d)*(d*f - c*g)^4) + (g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 - 2*b^2
*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) + (B*(b*c - a
*d)*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c
^2*g^2))*n*((b*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)) - (d*Log[c + d*x])/(
(b*c - a*d)*(d*f - c*g)) + (g*Log[f + g*x])/((b*f - a*g)*(d*f - c*g))))/((b
*f - a*g)^3*(d*f - c*g)^3) - (B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*n*(
g/((b*f - a*g)*(d*f - c*g)*(f + g*x)) - (b^2*Log[a + b*x])/((b*c - a*d)*(b*
f - a*g)^2) + (d^2*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^2) - (g*(2*b*d*f
- b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)))/(2*(b*f - a*
g)^2*(d*f - c*g)^2) - (B*(b*c - a*d)*g*n*(g/((b*f - a*g)*(d*f - c*g)*(f + g
*x)^2) + (2*g*(2*b*d*f - b*c*g - a*d*g))/((b*f - a*g)^2*(d*f - c*g)^2*(f +
g*x)) - (2*b^3*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^3) + (2*d^3*Log[c + d
*x])/((b*c - a*d)*(d*f - c*g)^3) - (2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g
) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/((b*f - a*g)^3*(d*
f - c*g)^3)))/(6*(b*f - a*g)*(d*f - c*g)) - (b^4*B*n*(Log[a + b*x]^2 - 2*Lo
g[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -((d*(a + b*x))/(b
*c - a*d))]))/(2*(b*c - a*d)*(b*f - a*g)^4) + (B*d^4*n*(2*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[c + d*x] - Log[c + d*x]^2 + 2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)]))/(2*(b*c - a*d)*(d*f - c*g)^4) - (B*g*(2*b*d*f - b*c*g - a*d
*g)*(2*b^2*d^2*f^2 - 2*b^2*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*
g^2)*n*(Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x] - Log[-((g*(c + d*x)
)/(d*f - c*g))]*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - Poly
Log[2, (d*(f + g*x))/(d*f - c*g)]))/((b*f - a*g)^4*(d*f - c*g)^4)))/(2*g)
```

fricas [F] time = 1.09, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2}{g^5x^5 + 5\,fg^4x^4 + 10\,f^2g^3x^3 + 10\,f^3g^2x^2 + 5\,f^4gx + f^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^5*x^5 + 5*f*g^4*x^4 + 10*f^2*g^3*x^3 + 10*f^3*g^2*x^2
+ 5*f^4*g*x + f^5), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}{\left(gx+f\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^5,x)
```

```
[Out] int((B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2/(g*x+f)^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x, algorithm="maxima
")
```

```
[Out] 1/12*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x))*A*B*n - 1/4*B^2*(log((d*x +
 c)^n)^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g) + 4*
integrate(-1/2*(2*d*g*x*log(e)^2 + 2*c*g*log(e)^2 + 2*(d*g*x + c*g)*log((b*
x + a)^n)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log((b*x + a)^n) + (d*f*n + (g*
n - 4*g*log(e))*d*x - 4*c*g*log(e) - 4*(d*g*x + c*g)*log((b*x + a)^n))*log(
(d*x + c)^n))/(d*g^6*x^6 + c*f^5*g + (5*d*f*g^5 + c*g^6)*x^5 + 5*(2*d*f^2*g
^4 + c*f*g^5)*x^4 + 10*(d*f^3*g^3 + c*f^2*g^4)*x^3 + 5*(d*f^4*g^2 + 2*c*f^3
*g^3)*x^2 + (d*f^5*g + 5*c*f^4*g^2)*x), x)) - 1/2*A*B*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n)/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^
4*g) - 1/4*A^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}{{\left(f+g\,x\right)}^5} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^5,x)
```

```
[Out] int((A + B*log(e*((a + b*x)/(c + d*x))^n))^2/(f + g*x)^5, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**5,x)
```

```
[Out] Timed out
```

3.76 $\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=35

$$\mathrm{Int}\left(\frac{(f+gx)^2}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable((g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + 2*f*g*Defe
r[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x] + g^2*Defer[Int][x^2/(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{f^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{2fgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{g^2x^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= f^2\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(2fg)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+g^2\int \frac{}{A+}\end{aligned}$$

Mathematica [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

fricas [A] time = 0.74, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B*log(e*((b*x + a)/(d*x + c))^n) + A),
x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[A]** time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

mupad **[A]** time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(f+g\,x\right)}^2}{A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] int((f + g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n)), x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(f + gx\right)^{2}}{A + B\log{\left(e\left(\frac{a}{c+dx} + \frac{bx}{c+dx}\right)^{n}\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral((f + g*x)**2/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x)
```

3.77 $\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=33

$$\text{Int}\left(\frac{f+gx}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] f*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + g*Defer[Int]
[x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{f}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= f\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+g\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

fricas [A] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{gx+f}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int((g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f+g\,x}{A+B\,\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^{n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] int((f + g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral((f + g*x)/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n)), x)
```

3.78 $\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

`[Out] Unintegrable(1/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)`

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

`[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1),x]`

`[Out] Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x]`

Rubi steps

$$\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Mathematica [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

`[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1),x]`

`[Out] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x]`

fricas [A] time = 1.07, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

`[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")`

`[Out] integral(1/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)`

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{1}{B \ln \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{B \log \left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^{n}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A + B*log(e*((a + b*x)/(c + d*x))^n)),x)
```

```
[Out] int(1/(A + B*log(e*((a + b*x)/(c + d*x))^n)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{A + B \log \left(e \left(\frac{a+bx}{c+dx}\right)^{n}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Integral(1/(A + B*log(e*((a + b*x)/(c + d*x))**n)), x)
```

3.79 $\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=35

$$\operatorname{Int}\left(\frac{1}{(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
[Out] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

fricas [A] time = 0.81, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{1}{Agx+Af+\left(Bgx+Bf\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
[Out] integral(1/(A*g*x + A*f + (B*g*x + B*f)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
[Out] Timed out
```

maple [**A**] time = 0.38, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
[Out] int(1/(g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
[Out] integrate(1/((g*x + f)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
[Out] int(1/((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)\right)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
[Out] Integral(1/((A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))*(f + g*x)), x)
```

3.80 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

fricas [A] time = 0.90, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ag^2x^2+2\,Afgx+Af^2+\left(Bg^2x^2+2\,Bfgx+Bf^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^2*x^2 + 2*A*f*g*x + A*f^2 + (B*g^2*x^2 + 2*B*f*g*x + B*f^2)
*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2} \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2} \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^2\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

3.81 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 11.86, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

fricas [A] time = 2.88, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ag^3x^3+3\,Afg^2x^2+3\,Af^2gx+Af^3+\left(Bg^3x^3+3\,Bfg^2x^2+3\,Bf^2gx+Bf^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^3*x^3 + 3*A*f*g^2*x^2 + 3*A*f^2*g*x + A*f^3 + (B*g^3*x^3 +
3*B*f*g^2*x^2 + 3*B*f^2*g*x + B*f^3)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3} \left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

```
[Out] int(1/(g*x+f)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^3\,\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))),x)
```

```
[Out] int(1/((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

3.82 $\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\mathrm{Int}\left(\frac{(f+gx)^2}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.000, Rules used = {}

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + 2*f*g*Defe
r[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x] + g^2*Defer[Int][x^2/
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{f^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{2fgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{g^2x^2}{\left(A+B\log\left(e\left(\frac{a+b}{c+}\right.\right.\right.}\right.\\ &= f^2\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+(2fg)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+g^2\end{aligned}$$

Mathematica [A] time = 0.94, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

fricas [A] time = 0.81, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 +
2*A*B*log(e*((b*x + a)/(d*x + c))^n) + A^2), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

maple [**A**] time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdg^{2}x^{4}+acf^{2}+\Big(adg^{2}+\big(2\,dfg+cg^{2}\big)b\Big)x^{3}+\Big(\big(2\,dfg+cg^{2}\big)a+\big(df^{2}+2\,cfg\big)b\Big)x^{2}+\Big(bcf^{2}+\big(df^{2}+2\,cfg\big)}{(bcn-adn)B^{2}\log\big((bx+a)^{n}\big)-(bcn-adn)B^{2}\log\big((dx+c)^{n}\big)+(bcn-adn)AB+\Big(bcn\log(e)-adn\log(e)\Big)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] -(b*d*g^2*x^4 + a*c*f^2 + (a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^3 + ((2*d*f*g +
 c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x^2 + (b*c*f^2 + (d*f^2 + 2*c*f*g)*a)*x)/(
(b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n)
 + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrate((4*
b*d*g^2*x^3 + b*c*f^2 + 3*(a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^2 + (d*f^2 + 2*
c*f*g)*a + 2*((2*d*f*g + c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x)/((b*c*n - a*d*n
)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*
d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(f+g\,x\right)}^2}{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((f + g*x)^2/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(f+gx\right)^2}{\left(A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Integral((f + g*x)**2/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))**2, x
)
```

3.83 $\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=33

$$\mathrm{Int}\left(\frac{f+gx}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] f*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + g*Defer[Int]
[x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{f}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right)dx\\ &= f\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+g\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

fricas [A] time = 0.90, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{gx+f}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*
x + a)/(d*x + c))^n) + A^2), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

maple [**A**] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int((g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdgx^{3}+acf+\left(adg+\left(df+cg\right)b\right)x^{2}+\left(bcf+\left(df+cg\right)a\right)x}{(bcn-adn)B^{2}\log\left((bx+a)^{n}\right)-(bcn-adn)B^{2}\log\left((dx+c)^{n}\right)+(bcn-adn)AB+\left(bcn\log(e)-adn\log(e)\right)B^{2}}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*g*x^3 + a*c*f + (a*d*g + (d*f + c*g)*b)*x^2 + (b*c*f + (d*f + c*g)*a)
*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x +
c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrat
e((3*b*d*g*x^2 + b*c*f + (d*f + c*g)*a + 2*(a*d*g + (d*f + c*g)*b)*x)/((b*c
*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (
b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f+g\,x}{{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^{n}\right)\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int((f + g*x)/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a}{c+dx}+\frac{bx}{c+dx}\right)^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Integral((f + g*x)/(A + B*log(e*(a/(c + d*x) + b*x/(c + d*x))**n))**2, x)
```

3.84 $\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2),x]
```

```
[Out] Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x]
```

Rubi steps

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.67, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2),x]
```

```
[Out] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x]
```

fricas [A] time = 0.88, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(
d*x + c))^n) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^(-2), x)
```

maple [A] time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdx^2 + ac + (bc + ad)x}{(bcn - adn)B^2\log\left((bx+a)^n\right) - (bcn - adn)B^2\log\left((dx+c)^n\right) + (bcn - adn)AB + \left(bcn\log(e) - adn\log(e)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b
*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) -
a*d*n*log(e))*B^2) + integrate((2*b*d*x + b*c + a*d)/((b*c*n - a*d*n)*B^2*l
og((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)*A*
B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(A + B\,\ln\left(e\left(\frac{a+b\,x}{c+d\,x}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2,x)
```

```
[Out] int(1/(A + B*log(e*((a + b*x)/(c + d*x))^n))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Integral((A + B*log(e*((a + b*x)/(c + d*x))**n))**(-2), x)
```

3.85 $\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
[Out] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

fricas [A] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2gx+A^2f+\left(B^2gx+B^2f\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\left(ABgx+ABf\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log(e*((b*x + a)/(d*x + c))
^n)^2 + 2*(A*B*g*x + A*B*f)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

maple [A] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(g*x+f)/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdx^{2}+}{\left(bcfn-adfn\right)AB+\left(bcfn\log(e)-adfn\log(e)\right)B^{2}+\left(\left(bcgn-adgn\right)AB+\left(bcgn\log(e)-adgn\log(e)\right)B^{2}\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f*n - a*d*f*n)*A*B + (b*c*f*n*log(e)
 - a*d*f*n*log(e))*B^2 + ((b*c*g*n - a*d*g*n)*A*B + (b*c*g*n*log(e) - a*d*g
*n*log(e))*B^2)*x + ((b*c*g*n - a*d*g*n)*B^2*x + (b*c*f*n - a*d*f*n)*B^2)*l
og((b*x + a)^n) - ((b*c*g*n - a*d*g*n)*B^2*x + (b*c*f*n - a*d*f*n)*B^2)*log
((d*x + c)^n)) + integrate((b*d*g*x^2 + 2*b*d*f*x + b*c*f + (d*f - c*g)*a)/
((b*c*f^2*n - a*d*f^2*n)*A*B + (b*c*f^2*n*log(e) - a*d*f^2*n*log(e))*B^2 +
((b*c*g^2*n - a*d*g^2*n)*A*B + (b*c*g^2*n*log(e) - a*d*g^2*n*log(e))*B^2)*x
^2 + 2*((b*c*f*g*n - a*d*f*g*n)*A*B + (b*c*f*g*n*log(e) - a*d*f*g*n*log(e))
*B^2)*x + ((b*c*g^2*n - a*d*g^2*n)*B^2*x^2 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*
x + (b*c*f^2*n - a*d*f^2*n)*B^2)*log((b*x + a)^n) - ((b*c*g^2*n - a*d*g^2*n
)*B^2*x^2 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*x + (b*c*f^2*n - a*d*f^2*n)*B^2)*
log((d*x + c)^n)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^{n}\right)\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
```

```
[Out] int(1/((f + g*x)*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.86 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 3.82, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

fricas [A] time = 1.22, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2g^2x^2+2\,A^2fgx+A^2f^2+\left(B^2g^2x^2+2\,B^2fgx+B^2f^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\left(ABg^2x^2+2\,ABfgx\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*
x + B^2*f^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*
x + A*B*f^2)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

maple [A] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(g*x+f)^2/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(bcf^{2}n-adf^{2}n\right)AB+\left(bcf^{2}n\log(e)-adf^{2}n\log(e)\right)B^{2}+\left(\left(bcg^{2}n-adg^{2}n\right)AB+\left(bcg^{2}n\log(e)-adg^{2}n\log(e)\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f^2*n - a*d*f^2*n)*A*B + (b*c*f^2*n*
log(e) - a*d*f^2*n*log(e))*B^2 + ((b*c*g^2*n - a*d*g^2*n)*A*B + (b*c*g^2*n*
log(e) - a*d*g^2*n*log(e))*B^2)*x^2 + 2*((b*c*f*g*n - a*d*f*g*n)*A*B + (b*c
*f*g*n*log(e) - a*d*f*g*n*log(e))*B^2)*x + ((b*c*g^2*n - a*d*g^2*n)*B^2*x^2
 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*x + (b*c*f^2*n - a*d*f^2*n)*B^2)*log((b*x
+ a)^n) - ((b*c*g^2*n - a*d*g^2*n)*B^2*x^2 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*
x + (b*c*f^2*n - a*d*f^2*n)*B^2)*log((d*x + c)^n)) - integrate(-(b*c*f + (d
*f - 2*c*g)*a - (a*d*g - (2*d*f - c*g)*b)*x)/(((b*c*g^3*n - a*d*g^3*n)*A*B
+ (b*c*g^3*n*log(e) - a*d*g^3*n*log(e))*B^2)*x^3 + (b*c*f^3*n - a*d*f^3*n)*
A*B + (b*c*f^3*n*log(e) - a*d*f^3*n*log(e))*B^2 + 3*((b*c*f*g^2*n - a*d*f*g
^2*n)*A*B + (b*c*f*g^2*n*log(e) - a*d*f*g^2*n*log(e))*B^2)*x^2 + 3*((b*c*f^
2*g*n - a*d*f^2*g*n)*A*B + (b*c*f^2*g*n*log(e) - a*d*f^2*g*n*log(e))*B^2)*x
 + ((b*c*g^3*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2*n)*B^2*x^2
 + 3*(b*c*f^2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)*B^2)*log((
b*x + a)^n) - ((b*c*g^3*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2
*n)*B^2*x^2 + 3*(b*c*f^2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)
*B^2)*log((d*x + c)^n)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^2\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
```

```
[Out] int(1/((f + g*x)^2*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

3.87 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\mathrm{Int}\left(\frac{1}{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 35.46, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

fricas [A] time = 0.83, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{A^2g^3x^3+3\,A^2fg^2x^2+3\,A^2f^2gx+A^2f^3+\left(B^2g^3x^3+3\,B^2fg^2x^2+3\,B^2f^2gx+B^2f^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*
g^3*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log(e*((b*x + a)/(d*x
+ c))^n)^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*lo
g(e*((b*x + a)/(d*x + c))^n)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

maple [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

```
[Out] int(1/(g*x+f)^3/(B*ln(e*((b*x+a)/(d*x+c))^n)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(\left(bcg^{3}n-adg^{3}n\right)AB+\left(bcg^{3}n\log(e)-adg^{3}n\log(e)\right)B^{2}\right)x^{3}+\left(bcf^{3}n-adf^{3}n\right)AB+\left(bcf^{3}n\log(e)-adf^{3}n\,l\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/(((b*c*g^3*n - a*d*g^3*n)*A*B + (b*c*g^3*n
*log(e) - a*d*g^3*n*log(e))*B^2)*x^3 + (b*c*f^3*n - a*d*f^3*n)*A*B + (b*c*f
^3*n*log(e) - a*d*f^3*n*log(e))*B^2 + 3*((b*c*f*g^2*n - a*d*f*g^2*n)*A*B +
(b*c*f*g^2*n*log(e) - a*d*f*g^2*n*log(e))*B^2)*x^2 + 3*((b*c*f^2*g*n - a*d*
f^2*g*n)*A*B + (b*c*f^2*g*n*log(e) - a*d*f^2*g*n*log(e))*B^2)*x + ((b*c*g^3
*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2*n)*B^2*x^2 + 3*(b*c*f^
2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)*B^2)*log((b*x + a)^n)
- ((b*c*g^3*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2*n)*B^2*x^2
+ 3*(b*c*f^2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)*B^2)*log((d
*x + c)^n)) - integrate((b*d*g*x^2 - b*c*f - (d*f - 3*c*g)*a + 2*(a*d*g - (
d*f - c*g)*b)*x)/(((b*c*g^4*n - a*d*g^4*n)*A*B + (b*c*g^4*n*log(e) - a*d*g^
4*n*log(e))*B^2)*x^4 + 4*((b*c*f*g^3*n - a*d*f*g^3*n)*A*B + (b*c*f*g^3*n*lo
g(e) - a*d*f*g^3*n*log(e))*B^2)*x^3 + (b*c*f^4*n - a*d*f^4*n)*A*B + (b*c*f^
4*n*log(e) - a*d*f^4*n*log(e))*B^2 + 6*((b*c*f^2*g^2*n - a*d*f^2*g^2*n)*A*B
 + (b*c*f^2*g^2*n*log(e) - a*d*f^2*g^2*n*log(e))*B^2)*x^2 + 4*((b*c*f^3*g*n
 - a*d*f^3*g*n)*A*B + (b*c*f^3*g*n*log(e) - a*d*f^3*g*n*log(e))*B^2)*x + ((
b*c*g^4*n - a*d*g^4*n)*B^2*x^4 + 4*(b*c*f*g^3*n - a*d*f*g^3*n)*B^2*x^3 + 6*
(b*c*f^2*g^2*n - a*d*f^2*g^2*n)*B^2*x^2 + 4*(b*c*f^3*g*n - a*d*f^3*g*n)*B^2
*x + (b*c*f^4*n - a*d*f^4*n)*B^2)*log((b*x + a)^n) - ((b*c*g^4*n - a*d*g^4*
n)*B^2*x^4 + 4*(b*c*f*g^3*n - a*d*f*g^3*n)*B^2*x^3 + 6*(b*c*f^2*g^2*n - a*d
```

```
*f^2*g^2*n)*B^2*x^2 + 4*(b*c*f^3*g*n - a*d*f^3*g*n)*B^2*x + (b*c*f^4*n - a*
d*f^4*n)*B^2)*log((d*x + c)^n)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)^3\,{\left(A+B\,\ln\left(e\,{\left(\frac{a+b\,x}{c+d\,x}\right)}^n\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2),x)
[Out] int(1/((f + g*x)^3*(A + B*log(e*((a + b*x)/(c + d*x))^n))^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
[Out] Timed out
```

3.88 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=180

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b}-\frac{Bg^4(bc-ad)^5\log(c+dx)}{5bd^5}+\frac{Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}+Bg^4(a$$

```
[Out] 1/5*B*(-a*d+b*c)^4*g^4*x/d^4-1/10*B*(-a*d+b*c)^3*g^4*(b*x+a)^2/b/d^3+1/15*B
*(-a*d+b*c)^2*g^4*(b*x+a)^3/b/d^2-1/20*B*(-a*d+b*c)*g^4*(b*x+a)^4/b/d+1/5*g
^4*(b*x+a)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/b-1/5*B*(-a*d+b*c)^5*g^4*ln(d*x+c)
/b/d^5
```

Rubi [A] time = 0.12, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b}+\frac{Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}-Bg^4(bc-$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^4*g^4*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(10*b*d
^3) + (B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g^4*(a
+ b*x)^4)/(20*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(5*b) - (B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b}-\frac{B\int\frac{(bc-ad)g^5(a+bx)^4}{c+dx}dx}{5bg}\\ &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b}-\frac{\left(B(bc-ad)g^4\right)\int\frac{(a+bx)^4}{c+dx}dx}{5b}\\ &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b}-\frac{\left(B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3}{d^4}+ b\right.}{}\\ &= \frac{B(bc-ad)^4g^4x}{5d^4}-\frac{B(bc-ad)^3g^4(a+bx)^2}{10bd^3}+\frac{B(bc-ad)^2g^4(a+bx)^3}{15bd^2}\end{aligned}$$

Mathematica [**A**] time = 0.10, size = 142, normalized size = 0.79

$$\frac{g^4\left((a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)\left(4d^3(a+bx)^3(ad-bc)+6d^2(a+bx)^2(bc-ad)^2-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(a+bx\right.}{12d^5}\right.}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(b*c - a*d)*(-1
2*b*d*(b*c - a*d)^3*x + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(-(b*c) + a
*d)*(a + b*x)^3 + 3*d^4*(a + b*x)^4 + 12*(b*c - a*d)^4*Log[c + d*x]))/(12*d
^5)))/(5*b)
```

fricas [**B**] time = 1.06, size = 431, normalized size = 2.39

$$\frac{12\,Ab^5d^5g^4x^5+12\,Ba^5d^5g^4\log(bx+a)-3\left(Bb^5cd^4-(20\,A+B)ab^4d^5\right)g^4x^4+4\left(Bb^5c^2d^3-5\,Bab^4cd^4+2\,(15\,A\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 12*B*a^5*d^5*g^4*log(b*x + a) - 3*(B*b^5*c*d^4
 - (20*A + B)*a*b^4*d^5)*g^4*x^4 + 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 + 2*(
15*A + 2*B)*a^2*b^3*d^5)*g^4*x^3 - 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 1
0*B*a^2*b^3*c*d^4 - 2*(10*A + 3*B)*a^3*b^2*d^5)*g^4*x^2 + 12*(B*b^5*c^4*d -
 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 10*B*a^3*b^2*c*d^4 + (5*A + 4*B
)*a^4*b*d^5)*g^4*x - 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2
 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 12*(B*b^5*d^5
*g^4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*
d^5*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^5)
```

giac [**B**] time = 2.56, size = 5428, normalized size = 30.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/60*(12*B*b^11*c^6*g^4*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 72*B*a*
b^10*c^5*d*g^4*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 180*B*a^2*b^9*c^
4*d^2*g^4*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 240*B*a^3*b^8*c^3*d^3
```

```
*g^4*e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 180*B*a^4*b^7*c^2*d^4*g^4*
e^6*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 72*B*a^5*b^6*c*d^5*g^4*e^6*log(
-b*e + (b*x*e + a*e)*d/(d*x + c)) + 12*B*a^6*b^5*d^6*g^4*e^6*log(-b*e + (b*
x*e + a*e)*d/(d*x + c)) - 60*(b*x*e + a*e)*B*b^10*c^6*d*g^4*e^5*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 360*(b*x*e + a*e)*B*a*b^9*c^5*d^2*g^
4*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 900*(b*x*e + a*e)*B
*a^2*b^8*c^4*d^3*g^4*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) +
1200*(b*x*e + a*e)*B*a^3*b^7*c^3*d^4*g^4*e^5*log(-b*e + (b*x*e + a*e)*d/(d*
x + c))/(d*x + c) - 900*(b*x*e + a*e)*B*a^4*b^6*c^2*d^5*g^4*e^5*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 360*(b*x*e + a*e)*B*a^5*b^5*c*d^6*g^
4*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 60*(b*x*e + a*e)*B*
a^6*b^4*d^7*g^4*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 120*(
b*x*e + a*e)^2*B*b^9*c^6*d^2*g^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/
(d*x + c)^2 - 720*(b*x*e + a*e)^2*B*a*b^8*c^5*d^3*g^4*e^4*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^2 + 1800*(b*x*e + a*e)^2*B*a^2*b^7*c^4*d^4*g
^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 2400*(b*x*e + a*
e)^2*B*a^3*b^6*c^3*d^5*g^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
 c)^2 + 1800*(b*x*e + a*e)^2*B*a^4*b^5*c^2*d^6*g^4*e^4*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c)^2 - 720*(b*x*e + a*e)^2*B*a^5*b^4*c*d^7*g^4*e^4
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 120*(b*x*e + a*e)^2*B*
a^6*b^3*d^8*g^4*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 120
*(b*x*e + a*e)^3*B*b^8*c^6*d^3*g^4*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c)^3 + 720*(b*x*e + a*e)^3*B*a*b^7*c^5*d^4*g^4*e^3*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 1800*(b*x*e + a*e)^3*B*a^2*b^6*c^4*d^5
*g^4*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 2400*(b*x*e +
a*e)^3*B*a^3*b^5*c^3*d^6*g^4*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c)^3 - 1800*(b*x*e + a*e)^3*B*a^4*b^4*c^2*d^7*g^4*e^3*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c)^3 + 720*(b*x*e + a*e)^3*B*a^5*b^3*c*d^8*g^4*e
^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 120*(b*x*e + a*e)^3*
B*a^6*b^2*d^9*g^4*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6
0*(b*x*e + a*e)^4*B*b^7*c^6*d^4*g^4*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c
))/(d*x + c)^4 - 360*(b*x*e + a*e)^4*B*a*b^6*c^5*d^5*g^4*e^2*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 900*(b*x*e + a*e)^4*B*a^2*b^5*c^4*d^6
*g^4*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 1200*(b*x*e +
a*e)^4*B*a^3*b^4*c^3*d^7*g^4*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c)^4 + 900*(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g^4*e^2*log(-b*e + (b*x*e +
 a*e)*d/(d*x + c))/(d*x + c)^4 - 360*(b*x*e + a*e)^4*B*a^5*b^2*c*d^9*g^4*e^
2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*
a^6*b*d^10*g^4*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 12*(
b*x*e + a*e)^5*B*b^6*c^6*d^5*g^4*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^5 + 72*(b*x*e + a*e)^5*B*a*b^5*c^5*d^6*g^4*e*log(-b*e + (b*x*e + a*
e)*d/(d*x + c))/(d*x + c)^5 - 180*(b*x*e + a*e)^5*B*a^2*b^4*c^4*d^7*g^4*e*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 240*(b*x*e + a*e)^5*B*a^
3*b^3*c^3*d^8*g^4*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 - 180
*(b*x*e + a*e)^5*B*a^4*b^2*c^2*d^9*g^4*e*log(-b*e + (b*x*e + a*e)*d/(d*x +
c))/(d*x + c)^5 + 72*(b*x*e + a*e)^5*B*a^5*b*c*d^10*g^4*e*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c))/(d*x + c)^5 - 12*(b*x*e + a*e)^5*B*a^6*d^11*g^4*e*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^5 + 12*(b*x*e + a*e)^5*B*b^6*c^
6*d^5*g^4*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 - 72*(b*x*e + a*e)^5*B
*a*b^5*c^5*d^6*g^4*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 + 180*(b*x*e
+ a*e)^5*B*a^2*b^4*c^4*d^7*g^4*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^5 -
 240*(b*x*e + a*e)^5*B*a^3*b^3*c^3*d^8*g^4*e*log((b*x*e + a*e)/(d*x + c))/(
d*x + c)^5 + 180*(b*x*e + a*e)^5*B*a^4*b^2*c^2*d^9*g^4*e*log((b*x*e + a*e)/
(d*x + c))/(d*x + c)^5 - 72*(b*x*e + a*e)^5*B*a^5*b*c*d^10*g^4*e*log((b*x*e
 + a*e)/(d*x + c))/(d*x + c)^5 + 12*(b*x*e + a*e)^5*B*a^6*d^11*g^4*e*log((b
*x*e + a*e)/(d*x + c))/(d*x + c)^5 + 12*A*b^11*c^6*g^4*e^6 + 25*B*b^11*c^6*
g^4*e^6 - 72*A*a*b^10*c^5*d*g^4*e^6 - 150*B*a*b^10*c^5*d*g^4*e^6 + 180*A*a^
2*b^9*c^4*d^2*g^4*e^6 + 375*B*a^2*b^9*c^4*d^2*g^4*e^6 - 240*A*a^3*b^8*c^3*d
^3*g^4*e^6 - 500*B*a^3*b^8*c^3*d^3*g^4*e^6 + 180*A*a^4*b^7*c^2*d^4*g^4*e^6
```

```
+ 375*B*a^4*b^7*c^2*d^4*g^4*e^6 - 72*A*a^5*b^6*c*d^5*g^4*e^6 - 150*B*a^5*b^
6*c*d^5*g^4*e^6 + 12*A*a^6*b^5*d^6*g^4*e^6 + 25*B*a^6*b^5*d^6*g^4*e^6 - 60*
(b*x*e + a*e)*A*b^10*c^6*d*g^4*e^5/(d*x + c) - 113*(b*x*e + a*e)*B*b^10*c^6
*d*g^4*e^5/(d*x + c) + 360*(b*x*e + a*e)*A*a*b^9*c^5*d^2*g^4*e^5/(d*x + c)
+ 678*(b*x*e + a*e)*B*a*b^9*c^5*d^2*g^4*e^5/(d*x + c) - 900*(b*x*e + a*e)*A
*a^2*b^8*c^4*d^3*g^4*e^5/(d*x + c) - 1695*(b*x*e + a*e)*B*a^2*b^8*c^4*d^3*g
^4*e^5/(d*x + c) + 1200*(b*x*e + a*e)*A*a^3*b^7*c^3*d^4*g^4*e^5/(d*x + c) +
 2260*(b*x*e + a*e)*B*a^3*b^7*c^3*d^4*g^4*e^5/(d*x + c) - 900*(b*x*e + a*e)
*A*a^4*b^6*c^2*d^5*g^4*e^5/(d*x + c) - 1695*(b*x*e + a*e)*B*a^4*b^6*c^2*d^5
*g^4*e^5/(d*x + c) + 360*(b*x*e + a*e)*A*a^5*b^5*c*d^6*g^4*e^5/(d*x + c) +
678*(b*x*e + a*e)*B*a^5*b^5*c*d^6*g^4*e^5/(d*x + c) - 60*(b*x*e + a*e)*A*a^
6*b^4*d^7*g^4*e^5/(d*x + c) - 113*(b*x*e + a*e)*B*a^6*b^4*d^7*g^4*e^5/(d*x
+ c) + 120*(b*x*e + a*e)^2*A*b^9*c^6*d^2*g^4*e^4/(d*x + c)^2 + 196*(b*x*e +
 a*e)^2*B*b^9*c^6*d^2*g^4*e^4/(d*x + c)^2 - 720*(b*x*e + a*e)^2*A*a*b^8*c^5
*d^3*g^4*e^4/(d*x + c)^2 - 1176*(b*x*e + a*e)^2*B*a*b^8*c^5*d^3*g^4*e^4/(d*
x + c)^2 + 1800*(b*x*e + a*e)^2*A*a^2*b^7*c^4*d^4*g^4*e^4/(d*x + c)^2 + 294
0*(b*x*e + a*e)^2*B*a^2*b^7*c^4*d^4*g^4*e^4/(d*x + c)^2 - 2400*(b*x*e + a*e
)^2*A*a^3*b^6*c^3*d^5*g^4*e^4/(d*x + c)^2 - 3920*(b*x*e + a*e)^2*B*a^3*b^6*
c^3*d^5*g^4*e^4/(d*x + c)^2 + 1800*(b*x*e + a*e)^2*A*a^4*b^5*c^2*d^6*g^4*e^
4/(d*x + c)^2 + 2940*(b*x*e + a*e)^2*B*a^4*b^5*c^2*d^6*g^4*e^4/(d*x + c)^2
- 720*(b*x*e + a*e)^2*A*a^5*b^4*c*d^7*g^4*e^4/(d*x + c)^2 - 1176*(b*x*e + a
*e)^2*B*a^5*b^4*c*d^7*g^4*e^4/(d*x + c)^2 + 120*(b*x*e + a*e)^2*A*a^6*b^3*d
^8*g^4*e^4/(d*x + c)^2 + 196*(b*x*e + a*e)^2*B*a^6*b^3*d^8*g^4*e^4/(d*x + c
)^2 - 120*(b*x*e + a*e)^3*A*b^8*c^6*d^3*g^4*e^3/(d*x + c)^3 - 156*(b*x*e +
a*e)^3*B*b^8*c^6*d^3*g^4*e^3/(d*x + c)^3 + 720*(b*x*e + a*e)^3*A*a*b^7*c^5*
d^4*g^4*e^3/(d*x + c)^3 + 936*(b*x*e + a*e)^3*B*a*b^7*c^5*d^4*g^4*e^3/(d*x
+ c)^3 - 1800*(b*x*e + a*e)^3*A*a^2*b^6*c^4*d^5*g^4*e^3/(d*x + c)^3 - 2340*
(b*x*e + a*e)^3*B*a^2*b^6*c^4*d^5*g^4*e^3/(d*x + c)^3 + 2400*(b*x*e + a*e)^
3*A*a^3*b^5*c^3*d^6*g^4*e^3/(d*x + c)^3 + 3120*(b*x*e + a*e)^3*B*a^3*b^5*c^
3*d^6*g^4*e^3/(d*x + c)^3 - 1800*(b*x*e + a*e)^3*A*a^4*b^4*c^2*d^7*g^4*e^3/
(d*x + c)^3 - 2340*(b*x*e + a*e)^3*B*a^4*b^4*c^2*d^7*g^4*e^3/(d*x + c)^3 +
720*(b*x*e + a*e)^3*A*a^5*b^3*c*d^8*g^4*e^3/(d*x + c)^3 + 936*(b*x*e + a*e)
^3*B*a^5*b^3*c*d^8*g^4*e^3/(d*x + c)^3 - 120*(b*x*e + a*e)^3*A*a^6*b^2*d^9*
g^4*e^3/(d*x + c)^3 - 156*(b*x*e + a*e)^3*B*a^6*b^2*d^9*g^4*e^3/(d*x + c)^3
 + 60*(b*x*e + a*e)^4*A*b^7*c^6*d^4*g^4*e^2/(d*x + c)^4 + 48*(b*x*e + a*e)^
4*B*b^7*c^6*d^4*g^4*e^2/(d*x + c)^4 - 360*(b*x*e + a*e)^4*A*a*b^6*c^5*d^5*g
^4*e^2/(d*x + c)^4 - 288*(b*x*e + a*e)^4*B*a*b^6*c^5*d^5*g^4*e^2/(d*x + c)^
4 + 900*(b*x*e + a*e)^4*A*a^2*b^5*c^4*d^6*g^4*e^2/(d*x + c)^4 + 720*(b*x*e
+ a*e)^4*B*a^2*b^5*c^4*d^6*g^4*e^2/(d*x + c)^4 - 1200*(b*x*e + a*e)^4*A*a^3
*b^4*c^3*d^7*g^4*e^2/(d*x + c)^4 - 960*(b*x*e + a*e)^4*B*a^3*b^4*c^3*d^7*g^
4*e^2/(d*x + c)^4 + 900*(b*x*e + a*e)^4*A*a^4*b^3*c^2*d^8*g^4*e^2/(d*x + c)
^4 + 720*(b*x*e + a*e)^4*B*a^4*b^3*c^2*d^8*g^4*e^2/(d*x + c)^4 - 360*(b*x*e
 + a*e)^4*A*a^5*b^2*c*d^9*g^4*e^2/(d*x + c)^4 - 288*(b*x*e + a*e)^4*B*a^5*b
^2*c*d^9*g^4*e^2/(d*x + c)^4 + 60*(b*x*e + a*e)^4*A*a^6*b*d^10*g^4*e^2/(d*x
 + c)^4 + 48*(b*x*e + a*e)^4*B*a^6*b*d^10*g^4*e^2/(d*x + c)^4)*(b*c/((b*c*e
 - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^6*d^5*e^5 -
5*(b*x*e + a*e)*b^5*d^6*e^4/(d*x + c) + 10*(b*x*e + a*e)^2*b^4*d^7*e^3/(d*x
 + c)^2 - 10*(b*x*e + a*e)^3*b^3*d^8*e^2/(d*x + c)^3 + 5*(b*x*e + a*e)^4*b^
2*d^9*e/(d*x + c)^4 - (b*x*e + a*e)^5*b*d^10/(d*x + c)^5)
```

maple [B] time = 0.18, size = 8417, normalized size = 46.76

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)

[Out] result too large to display
```

maxima [B] time = 1.32, size = 623, normalized size = 3.46

$$\frac{1}{5}\,Ab^4g^4x^5+Aab^3g^4x^4+2\,Aa^2b^2g^4x^3+2\,Aa^3bg^4x^2+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x
 + c)/d)*B*a^4*g^4 + 2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(
b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^3*b*g^4 + (2
*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*
log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2
*d^2))*B*a^2*b^2*g^4 + 1/6*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*
a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*
x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B
*a*b^3*g^4 + 1/60*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log
(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 -
4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4
*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

mupad [B] time = 4.78, size = 1009, normalized size = 5.61

$$\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(B\,a^4\,g^4\,x+2\,B\,a^3\,b\,g^4\,x^2+2\,B\,a^2\,b^2\,g^4\,x^3+B\,a\,b^3\,g^4\,x^4+\frac{B\,b^4\,g^4\,x^5}{5}\right)-x^3\left(\left(\frac{b^3\,g^4\,(25\,A\,a\,d+5\,A\,b\,c}{5\,d}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] log((e*(a + b*x))/(c + d*x))*((B*b^4*g^4*x^5)/5 + B*a^4*g^4*x + 2*B*a^3*b*g
^4*x^2 + B*a*b^3*g^4*x^4 + 2*B*a^2*b^2*g^4*x^3) - x^3*((((b^3*g^4*(25*A*a*d
 + 5*A*b*c + B*a*d - B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*
a*d + 5*b*c))/(15*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d - B*b*c))/(
3*d) + (A*a*b^3*c*g^4)/(3*d)) + x^2*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d
 + 5*A*b*c + B*a*d - B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*
a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d - B*b*c))/d
+ (A*a*b^3*c*g^4)/d))/(10*b*d) + (a^2*b*g^4*(5*A*a*d + 5*A*b*c + B*a*d - B*
b*c))/d - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d - B*b*c))/(5*d) - (A*b
^3*g^4*(5*a*d + 5*b*c))/(5*d)))/(2*b*d)) + x*((a^3*g^4*(5*A*a*d + 10*A*b*c
+ 2*B*a*d - 2*B*b*c))/d - ((5*a*d + 5*b*c)*(((5*a*d + 5*b*c)*((((b^3*g^4*(2
5*A*a*d + 5*A*b*c + B*a*d - B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*
d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d - B*b
*c))/d + (A*a*b^3*c*g^4)/d))/(5*b*d) + (2*a^2*b*g^4*(5*A*a*d + 5*A*b*c + B*
a*d - B*b*c))/d - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c + B*a*d - B*b*c))/(5*d
) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d)))/(b*d)))/(5*b*d) + (a*c*((((b^3*g^4*
(25*A*a*d + 5*A*b*c + B*a*d - B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(
5*d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + B*a*d - B
*b*c))/d + (A*a*b^3*c*g^4)/d))/(b*d)) + x^4*((b^3*g^4*(25*A*a*d + 5*A*b*c +
```

```
 B*a*d - B*b*c))/(20*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(20*d)) - (log(c + d*
x)*(B*b^4*c^5*g^4 + 5*B*a^4*c*d^4*g^4 - 10*B*a^3*b*c^2*d^3*g^4 + 10*B*a^2*b
^2*c^3*d^2*g^4 - 5*B*a*b^3*c^4*d*g^4))/(5*d^5) + (A*b^4*g^4*x^5)/5 + (B*a^5
*g^4*log(a + b*x))/(5*b)
```

sympy [B] time = 6.40, size = 969, normalized size = 5.38

$$\frac{Ab^{4}g^{4}x^{5}}{5}+\frac{Ba^{5}g^{4}\log\left(x+\frac{\frac{Ba^{6}d^{5}g^{4}}{b}+5Ba^{5}cd^{4}g^{4}-10Ba^{4}bc^{2}d^{3}g^{4}+10Ba^{3}b^{2}c^{3}d^{2}g^{4}-5Ba^{2}b^{3}c^{4}dg^{4}+Bab^{4}c^{5}g^{4}}{Ba^{5}d^{5}g^{4}+5Ba^{4}bcd^{4}g^{4}-10Ba^{3}b^{2}c^{2}d^{3}g^{4}+10Ba^{2}b^{3}c^{3}d^{2}g^{4}-5Bab^{4}c^{4}dg^{4}+Bb^{5}c^{5}g^{4}}\right)}{5b}-\frac{Bcg^{4}(5a^{4}d^{4}-10a^{3}bcd^{3}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**4*g**4*x**5/5 + B*a**5*g**4*log(x + (B*a**6*d**5*g**4/b + 5*B*a**5*c*d
**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b**2*c**3*d**2*g**4 - 5*B
*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4)/(B*a**5*d**5*g**4 + 5*B*a**4*b
*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d**2*g**
4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*b) - B*c*g**4*(5*a**4*d*
*4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**
4)*log(x + (6*B*a**5*c*d**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b
**2*c**3*d**2*g**4 - 5*B*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4 - B*a*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4) + B*b*c**2*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**
2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/(B*a**5*d**5*g**4 + 5*B*
a**4*b*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d*
*2*g**4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*d**5) + x**4*(A*a*
b**3*g**4 + B*a*b**3*g**4/20 - B*b**4*c*g**4/(20*d)) + x**3*(2*A*a**2*b**2*
g**4 + 4*B*a**2*b**2*g**4/15 - B*a*b**3*c*g**4/(3*d) + B*b**4*c**2*g**4/(15
*d**2)) + x**2*(2*A*a**3*b*g**4 + 3*B*a**3*b*g**4/5 - B*a**2*b**2*c*g**4/d
+ B*a*b**3*c**2*g**4/(2*d**2) - B*b**4*c**3*g**4/(10*d**3)) + x*(A*a**4*g**
4 + 4*B*a**4*g**4/5 - 2*B*a**3*b*c*g**4/d + 2*B*a**2*b**2*c**2*g**4/d**2 -
B*a*b**3*c**3*g**4/d**3 + B*b**4*c**4*g**4/(5*d**4)) + (B*a**4*g**4*x + 2*B
*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g**4*x**3 + B*a*b**3*g**4*x**4 + B*b**4*g
**4*x**5/5)*log(e*(a + b*x)/(c + d*x))
```

3.89 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=149

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}-\frac{Bg^3x(bc-ad)^3}{4d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}-Bg^3(a$$

```
[Out] -1/4*B*(-a*d+b*c)^3*g^3*x/d^3+1/8*B*(-a*d+b*c)^2*g^3*(b*x+a)^2/b/d^2-1/12*B
*(-a*d+b*c)*g^3*(b*x+a)^3/b/d+1/4*g^3*(b*x+a)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))
/b+1/4*B*(-a*d+b*c)^4*g^3*ln(d*x+c)/b/d^4
```

Rubi [A] time = 0.10, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = $\{2525, 12, 43\}$

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b}-\frac{Bg^3x(bc-ad)^3}{4d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}-Bg^3(a$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^3*g^3*x)/(4*d^3) + (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(8*b*d
^2) - (B*(b*c - a*d)*g^3*(a + b*x)^3)/(12*b*d) + (g^3*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(4*b) + (B*(b*c - a*d)^4*g^3*Log[c + d*x])/(4*
b*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx = \frac{g^3(a+bx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b} - \frac{B\int \frac{(bc-ad)g^4(a+bx)^3}{c+dx} dx}{4bg}$$

$$= \frac{g^3(a+bx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b} - \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3}{c+dx} dx}{4b}$$

$$= \frac{g^3(a+bx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b} - \left(B(bc-ad)g^3\right)\int \Big(\frac{b(bc-ad)^2}{d^3} -$$

$$= -\frac{B(bc-ad)^3g^3x}{4d^3} + \frac{B(bc-ad)^2g^3(a+bx)^2}{8bd^2} - \frac{B(bc-ad)g^3(a+bx)^3}{12bd}$$

Mathematica [**A**] time = 0.10, size = 120, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{6d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(b*c - a*d)*(6*
b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3
- 6*(b*c - a*d)^3*Log[c + d*x]))/(6*d^4)))/(4*b)
```

fricas [**B**] time = 1.01, size = 318, normalized size = 2.13

$$\frac{6\,Ab^4d^4g^3x^4 + 6\,Ba^4d^4g^3\log(bx+a) - 2\left(Bb^4cd^3 - (12\,A+B)ab^3d^4\right)g^3x^3 + 3\Big(Bb^4c^2d^2 - 4\,Bab^3cd^3 + 3\,(4\,A +}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 + 6*B*a^4*d^4*g^3*log(b*x + a) - 2*(B*b^4*c*d^3 -
 (12*A + B)*a*b^3*d^4)*g^3*x^3 + 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + 3*(4*
A + B)*a^2*b^2*d^4)*g^3*x^2 - 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*
b^2*c*d^3 - (4*A + 3*B)*a^3*b*d^4)*g^3*x + 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 6*(B*b^4*d^4*g^3
*x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*
x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^4)
```

giac [**B**] time = 1.81, size = 3795, normalized size = 25.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] -1/24*(6*B*b^9*c^5*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 30*B*a*b
^8*c^4*d*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 60*B*a^2*b^7*c^3*d
^2*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 60*B*a^3*b^6*c^2*d^3*g^3
*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 30*B*a^4*b^5*c*d^4*g^3*e^5*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 6*B*a^5*b^4*d^5*g^3*e^5*log(-b*e + (b*
x*e + a*e)*d/(d*x + c)) - 24*(b*x*e + a*e)*B*b^8*c^5*d*g^3*e^4*log(-b*e + (
```

```
b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 120*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g^3
*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 240*(b*x*e + a*e)*B*
a^2*b^6*c^3*d^3*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 2
40*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c) - 120*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^3*e^4*log(-b*e + (b*x
*e + a*e)*d/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 36*(b*x*e + a*e)^2*B*b^7*c
^5*d^2*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 180*(b*x
*e + a*e)^2*B*a*b^6*c^4*d^3*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(
d*x + c)^2 + 360*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^2 - 360*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g
^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 180*(b*x*e + a*e
)^2*B*a^4*b^3*c*d^6*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^2 - 36*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c)^2 - 24*(b*x*e + a*e)^3*B*b^6*c^5*d^3*g^3*e^2*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 120*(b*x*e + a*e)^3*B*a*b^5*c^4*d^
4*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 240*(b*x*e +
a*e)^3*B*a^2*b^4*c^3*d^5*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c)^3 + 240*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^6*g^3*e^2*log(-b*e + (b*x*e +
 a*e)*d/(d*x + c))/(d*x + c)^3 - 120*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g^3*e^
2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*
a^5*b*d^8*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6*(b*
x*e + a*e)^4*B*b^5*c^5*d^4*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c)^4 - 30*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^3*e*log(-b*e + (b*x*e + a*e)
*d/(d*x + c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^3*e*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 60*(b*x*e + a*e)^4*B*a^3*b^
2*c^2*d^7*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 30*(b*x
*e + a*e)^4*B*a^4*b*c*d^8*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c)^4 - 6*(b*x*e + a*e)^4*B*a^5*d^9*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^4 - 6*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^3*e*log((b*x*e + a*e)
/(d*x + c))/(d*x + c)^4 + 30*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^3*e*log((b*x
*e + a*e)/(d*x + c))/(d*x + c)^4 - 60*(b*x*e + a*e)^4*B*a^2*b^3*c^3*d^6*g^3
*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 60*(b*x*e + a*e)^4*B*a^3*b^2*
c^2*d^7*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 30*(b*x*e + a*e)^4
*B*a^4*b*c*d^8*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 6*(b*x*e +
a*e)^4*B*a^5*d^9*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 6*A*b^9*c
^5*g^3*e^5 + 11*B*b^9*c^5*g^3*e^5 - 30*A*a*b^8*c^4*d*g^3*e^5 - 55*B*a*b^8*c
^4*d*g^3*e^5 + 60*A*a^2*b^7*c^3*d^2*g^3*e^5 + 110*B*a^2*b^7*c^3*d^2*g^3*e^5
 - 60*A*a^3*b^6*c^2*d^3*g^3*e^5 - 110*B*a^3*b^6*c^2*d^3*g^3*e^5 + 30*A*a^4*
b^5*c*d^4*g^3*e^5 + 55*B*a^4*b^5*c*d^4*g^3*e^5 - 6*A*a^5*b^4*d^5*g^3*e^5 -
11*B*a^5*b^4*d^5*g^3*e^5 - 24*(b*x*e + a*e)*A*b^8*c^5*d*g^3*e^4/(d*x + c) -
 38*(b*x*e + a*e)*B*b^8*c^5*d*g^3*e^4/(d*x + c) + 120*(b*x*e + a*e)*A*a*b^7
*c^4*d^2*g^3*e^4/(d*x + c) + 190*(b*x*e + a*e)*B*a*b^7*c^4*d^2*g^3*e^4/(d*x
 + c) - 240*(b*x*e + a*e)*A*a^2*b^6*c^3*d^3*g^3*e^4/(d*x + c) - 380*(b*x*e
+ a*e)*B*a^2*b^6*c^3*d^3*g^3*e^4/(d*x + c) + 240*(b*x*e + a*e)*A*a^3*b^5*c^
2*d^4*g^3*e^4/(d*x + c) + 380*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^3*e^4/(d*x
+ c) - 120*(b*x*e + a*e)*A*a^4*b^4*c*d^5*g^3*e^4/(d*x + c) - 190*(b*x*e + a
*e)*B*a^4*b^4*c*d^5*g^3*e^4/(d*x + c) + 24*(b*x*e + a*e)*A*a^5*b^3*d^6*g^3*
e^4/(d*x + c) + 38*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4/(d*x + c) + 36*(b*x*
e + a*e)^2*A*b^7*c^5*d^2*g^3*e^3/(d*x + c)^2 + 45*(b*x*e + a*e)^2*B*b^7*c^5
*d^2*g^3*e^3/(d*x + c)^2 - 180*(b*x*e + a*e)^2*A*a*b^6*c^4*d^3*g^3*e^3/(d*x
 + c)^2 - 225*(b*x*e + a*e)^2*B*a*b^6*c^4*d^3*g^3*e^3/(d*x + c)^2 + 360*(b*
x*e + a*e)^2*A*a^2*b^5*c^3*d^4*g^3*e^3/(d*x + c)^2 + 450*(b*x*e + a*e)^2*B*
a^2*b^5*c^3*d^4*g^3*e^3/(d*x + c)^2 - 360*(b*x*e + a*e)^2*A*a^3*b^4*c^2*d^5
*g^3*e^3/(d*x + c)^2 - 450*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3/(d*x +
 c)^2 + 180*(b*x*e + a*e)^2*A*a^4*b^3*c*d^6*g^3*e^3/(d*x + c)^2 + 225*(b*x*
e + a*e)^2*B*a^4*b^3*c*d^6*g^3*e^3/(d*x + c)^2 - 36*(b*x*e + a*e)^2*A*a^5*b
^2*d^7*g^3*e^3/(d*x + c)^2 - 45*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^3*e^3/(d*x
+ c)^2 - 24*(b*x*e + a*e)^3*A*b^6*c^5*d^3*g^3*e^2/(d*x + c)^3 - 18*(b*x*e +
```

```
 a*e)^3*B*b^6*c^5*d^3*g^3*e^2/(d*x + c)^3 + 120*(b*x*e + a*e)^3*A*a*b^5*c^4
*d^4*g^3*e^2/(d*x + c)^3 + 90*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^3*e^2/(d*x
+ c)^3 - 240*(b*x*e + a*e)^3*A*a^2*b^4*c^3*d^5*g^3*e^2/(d*x + c)^3 - 180*(b
*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^3*e^2/(d*x + c)^3 + 240*(b*x*e + a*e)^3*A
*a^3*b^3*c^2*d^6*g^3*e^2/(d*x + c)^3 + 180*(b*x*e + a*e)^3*B*a^3*b^3*c^2*d^
6*g^3*e^2/(d*x + c)^3 - 120*(b*x*e + a*e)^3*A*a^4*b^2*c*d^7*g^3*e^2/(d*x +
c)^3 - 90*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g^3*e^2/(d*x + c)^3 + 24*(b*x*e +
 a*e)^3*A*a^5*b*d^8*g^3*e^2/(d*x + c)^3 + 18*(b*x*e + a*e)^3*B*a^5*b*d^8*g^
3*e^2/(d*x + c)^3)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e
)*(b*c - a*d)))/(b^5*d^4*e^4 - 4*(b*x*e + a*e)*b^4*d^5*e^3/(d*x + c) + 6*(b
*x*e + a*e)^2*b^3*d^6*e^2/(d*x + c)^2 - 4*(b*x*e + a*e)^3*b^2*d^7*e/(d*x +
c)^3 + (b*x*e + a*e)^4*b*d^8/(d*x + c)^4)
```

maple [**B**]   time = 0.16, size = 5556, normalized size = 37.29

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

maxima [**B**]   time = 1.33, size = 439, normalized size = 2.95

$$\frac{1}{4}\,Ab^{3}g^{3}x^{4}+Aab^{2}g^{3}x^{3}+\frac{3}{2}\,Aa^{2}bg^{3}x^{2}+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)Ba^{3}g^{3}+\frac{3}{2}\left(x^{2}\,\mathrm{lo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(b*e*x/(d
*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^3*g^3 +
 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2
*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + 1/2*(2*x^3*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d
^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2
*g^3 + 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a
)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^
2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^3 + A*a^
3*g^3*x
```

mupad [**B**]   time = 4.64, size = 566, normalized size = 3.80

$$x\left(\frac{\left(4\,a\,d+4\,b\,c\right)\left(\frac{\left(\frac{b^{2}\,g^{3}\,\left(16\,A\,a\,d+4\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{4\,d}-\frac{A\,b^{2}\,g^{3}\,\left(4\,a\,d+4\,b\,c\right)}{4\,d}\right)\left(4\,a\,d+4\,b\,c\right)}{4\,b\,d}-\frac{a\,b\,g^{3}\,\left(6\,A\,a\,d+4\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{d}+\frac{A\,a\,b^{2}\,c\,g^{3}}{d}\right)}{4\,b\,d}+a^{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] x*(((4*a*d + 4*b*c)*((((b^2*g^3*(16*A*a*d + 4*A*b*c + B*a*d - B*b*c))/(4*d)
 - (A*b^2*g^3*(4*a*d + 4*b*c))/(4*d))*(4*a*d + 4*b*c))/(4*b*d) - (a*b*g^3*(
6*A*a*d + 4*A*b*c + B*a*d - B*b*c))/d + (A*a*b^2*c*g^3)/d))/(4*b*d) + (a^2*
g^3*(8*A*a*d + 12*A*b*c + 3*B*a*d - 3*B*b*c))/(2*d) - (a*c*((b^2*g^3*(16*A*
a*d + 4*A*b*c + B*a*d - B*b*c))/(4*d) - (A*b^2*g^3*(4*a*d + 4*b*c))/(4*d))
```

```
/(b*d)) - x^2*((((b^2*g^3*(16*A*a*d + 4*A*b*c + B*a*d - B*b*c))/(4*d) - (A*
b^2*g^3*(4*a*d + 4*b*c))/(4*d))*(4*a*d + 4*b*c))/(8*b*d) - (a*b*g^3*(6*A*a*
d + 4*A*b*c + B*a*d - B*b*c))/(2*d) + (A*a*b^2*c*g^3)/(2*d)) + log((e*(a +
b*x))/(c + d*x))*((B*b^3*g^3*x^4)/4 + B*a^3*g^3*x + (3*B*a^2*b*g^3*x^2)/2 +
 B*a*b^2*g^3*x^3) + x^3*((b^2*g^3*(16*A*a*d + 4*A*b*c + B*a*d - B*b*c))/(12
*d) - (A*b^2*g^3*(4*a*d + 4*b*c))/(12*d)) + (log(c + d*x)*(B*b^3*c^4*g^3 -
4*B*a^3*c*d^3*g^3 + 6*B*a^2*b*c^2*d^2*g^3 - 4*B*a*b^2*c^3*d*g^3))/(4*d^4) +
 (A*b^3*g^3*x^4)/4 + (B*a^4*g^3*log(a + b*x))/(4*b)
```

sympy [B] time = 4.30, size = 706, normalized size = 4.74

$$\frac{Ab^3g^3x^4}{4}+\frac{Ba^4g^3\log\left(x+\frac{\frac{Ba^5d^4g^3}{b}+4Ba^4cd^3g^3-6Ba^3bc^2d^2g^3+4Ba^2b^2c^3dg^3-Bab^3c^4g^3}{Ba^4d^4g^3+4Ba^3bcd^3g^3-6Ba^2b^2c^2d^2g^3+4Bab^3c^3dg^3-Bb^4c^4g^3}\right)}{4b}-\frac{Bcg^3\left(2ad-bc\right)\left(2a^2d^2-2abcd+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**3*g**3*x**4/4 + B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*b) - B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*d**4) + x**3*(A*a*b**2*g**3 + B*a
*b**2*g**3/12 - B*b**3*c*g**3/(12*d)) + x**2*(3*A*a**2*b*g**3/2 + 3*B*a**2*
b*g**3/8 - B*a*b**2*c*g**3/(2*d) + B*b**3*c**2*g**3/(8*d**2)) + x*(A*a**3*g
**3 + 3*B*a**3*g**3/4 - 3*B*a**2*b*c*g**3/(2*d) + B*a*b**2*c**2*g**3/d**2 -
 B*b**3*c**3*g**3/(4*d**3)) + (B*a**3*g**3*x + 3*B*a**2*b*g**3*x**2/2 + B*a
*b**2*g**3*x**3 + B*b**3*g**3*x**4/4)*log(e*(a + b*x)/(c + d*x))
```

3.90 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=118

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b}-\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2x(bc-ad)^2}{3d^2}-\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

```
[Out] 1/3*B*(-a*d+b*c)^2*g^2*x/d^2-1/6*B*(-a*d+b*c)*g^2*(b*x+a)^2/b/d+1/3*g^2*(b*
x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b-1/3*B*(-a*d+b*c)^3*g^2*ln(d*x+c)/b/d^3
```

Rubi **[A]** time = 0.08, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = $\{2525, 12, 43\}$

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b}+\frac{Bg^2x(bc-ad)^2}{3d^2}-\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B*(b*c - a*d)*g^2*(a + b*x)^2)/(6*b*d) +
 (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b) - (B*(b*c - a
*d)^3*g^2*Log[c + d*x])/(3*b*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b} - \frac{B\int \frac{(bc-ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b} - \frac{\left(B(bc-ad)g^2\right)\int \frac{(a+bx)^2}{c+dx}\,dx}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b} - \frac{\left(B(bc-ad)g^2\right)\int \left(-\frac{b(bc-ad)}{d^2} +\right.}{3b}$$

$$= \frac{B(bc-ad)^2g^2x}{3d^2} - \frac{B(bc-ad)g^2(a+bx)^2}{6bd} + \frac{g^2(a+bx)^3\left(A+B\,\mathrm{lo}\right.}{3b}$$

Mathematica [**A**]   time = 0.06, size = 99, normalized size = 0.84

$$\frac{g^2\left(\frac{B(ad-bc)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{2d^3}+(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*(-(b*c) + a*d)*
(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c - a*d)^2*Log[c + d*x])
)/(2*d^3)))/(3*b)
```

fricas [**B**]   time = 0.57, size = 222, normalized size = 1.88

$$\frac{2\,Ab^3d^3g^2x^3+2\,Ba^3d^3g^2\log\left(bx+a\right)-\left(Bb^3cd^2-(6\,A+B)ab^2d^3\right)g^2x^2+2\left(Bb^3c^2d-3\,Bab^2cd^2+(3\,A+2\,B\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 + 2*B*a^3*d^3*g^2*log(b*x + a) - (B*b^3*c*d^2 - (6
*A + B)*a*b^2*d^3)*g^2*x^2 + 2*(B*b^3*c^2*d - 3*B*a*b^2*c*d^2 + (3*A + 2*B)
*a^2*b*d^3)*g^2*x - 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*l
og(d*x + c) + 2*(B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*
g^2*x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^3)
```

giac [**B**]   time = 1.29, size = 2450, normalized size = 20.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/6*(2*B*b^7*c^4*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*B*a*b^6*
c^3*d*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 12*B*a^2*b^5*c^2*d^2*
g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 8*B*a^3*b^4*c*d^3*g^2*e^4*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 2*B*a^4*b^3*d^4*g^2*e^4*log(-b*e + (
b*x*e + a*e)*d/(d*x + c)) - 6*(b*x*e + a*e)*B*b^6*c^4*d*g^2*e^3*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g^2
*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 36*(b*x*e + a*e)*B*a
^2*b^4*c^2*d^3*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 24
```

```
*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c) - 6*(b*x*e + a*e)*B*a^4*b^2*d^5*g^2*e^3*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g^2*e^2*log(-b*e
 + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 24*(b*x*e + a*e)^2*B*a*b^4*c^3*
d^3*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 36*(b*x*e +
 a*e)^2*B*a^2*b^3*c^2*d^4*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*
x + c)^2 - 24*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g^2*e^2*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*a^4*b*d^6*g^2*e^2*log(-b
*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 2*(b*x*e + a*e)^3*B*b^4*c^4*d
^3*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 8*(b*x*e + a*e
)^3*B*a*b^3*c^3*d^4*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3
 - 12*(b*x*e + a*e)^3*B*a^2*b^2*c^2*d^5*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c)^3 + 8*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g^2*e*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 2*(b*x*e + a*e)^3*B*a^4*d^7*g^2*e*log
(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 2*(b*x*e + a*e)^3*B*b^4*c^
4*d^3*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 8*(b*x*e + a*e)^3*B*
a*b^3*c^3*d^4*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 12*(b*x*e +
a*e)^3*B*a^2*b^2*c^2*d^5*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 8
*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
^3 + 2*(b*x*e + a*e)^3*B*a^4*d^7*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^3 + 2*A*b^7*c^4*g^2*e^4 + 3*B*b^7*c^4*g^2*e^4 - 8*A*a*b^6*c^3*d*g^2*e^4
- 12*B*a*b^6*c^3*d*g^2*e^4 + 12*A*a^2*b^5*c^2*d^2*g^2*e^4 + 18*B*a^2*b^5*c^
2*d^2*g^2*e^4 - 8*A*a^3*b^4*c*d^3*g^2*e^4 - 12*B*a^3*b^4*c*d^3*g^2*e^4 + 2*
A*a^4*b^3*d^4*g^2*e^4 + 3*B*a^4*b^3*d^4*g^2*e^4 - 6*(b*x*e + a*e)*A*b^6*c^4
*d*g^2*e^3/(d*x + c) - 7*(b*x*e + a*e)*B*b^6*c^4*d*g^2*e^3/(d*x + c) + 24*(
b*x*e + a*e)*A*a*b^5*c^3*d^2*g^2*e^3/(d*x + c) + 28*(b*x*e + a*e)*B*a*b^5*c
^3*d^2*g^2*e^3/(d*x + c) - 36*(b*x*e + a*e)*A*a^2*b^4*c^2*d^3*g^2*e^3/(d*x
+ c) - 42*(b*x*e + a*e)*B*a^2*b^4*c^2*d^3*g^2*e^3/(d*x + c) + 24*(b*x*e + a
*e)*A*a^3*b^3*c*d^4*g^2*e^3/(d*x + c) + 28*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g^
2*e^3/(d*x + c) - 6*(b*x*e + a*e)*A*a^4*b^2*d^5*g^2*e^3/(d*x + c) - 7*(b*x*
e + a*e)*B*a^4*b^2*d^5*g^2*e^3/(d*x + c) + 6*(b*x*e + a*e)^2*A*b^5*c^4*d^2*
g^2*e^2/(d*x + c)^2 + 4*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g^2*e^2/(d*x + c)^2 -
 24*(b*x*e + a*e)^2*A*a*b^4*c^3*d^3*g^2*e^2/(d*x + c)^2 - 16*(b*x*e + a*e)^
2*B*a*b^4*c^3*d^3*g^2*e^2/(d*x + c)^2 + 36*(b*x*e + a*e)^2*A*a^2*b^3*c^2*d^
4*g^2*e^2/(d*x + c)^2 + 24*(b*x*e + a*e)^2*B*a^2*b^3*c^2*d^4*g^2*e^2/(d*x +
 c)^2 - 24*(b*x*e + a*e)^2*A*a^3*b^2*c*d^5*g^2*e^2/(d*x + c)^2 - 16*(b*x*e
+ a*e)^2*B*a^3*b^2*c*d^5*g^2*e^2/(d*x + c)^2 + 6*(b*x*e + a*e)^2*A*a^4*b*d^
6*g^2*e^2/(d*x + c)^2 + 4*(b*x*e + a*e)^2*B*a^4*b*d^6*g^2*e^2/(d*x + c)^2)*
(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^
4*d^3*e^3 - 3*(b*x*e + a*e)*b^3*d^4*e^2/(d*x + c) + 3*(b*x*e + a*e)^2*b^2*d
^5*e/(d*x + c)^2 - (b*x*e + a*e)^3*b*d^6/(d*x + c)^3)
```

maple [B] time = 0.15, size = 3283, normalized size = 27.82

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] e*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+2/3*e*B*g^2/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)*a^3-1/d^3*e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)*c^3-1/d^3*e^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)^2*b^4*c^3-1/3/d^3*e^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^5*c^3-4*e*B*g^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)*c+1/2/d^2*e^2*B*
g^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^2+1/d^2*e^3*A*g^2*b^4/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*a*c^2-3/d*e*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*
b*c-2/d*e*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*b*c+3/d^2*e^2*A*g^2*b^3/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^2-3/d*e^2*A*g^2*b^2/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^2*a^2*c-1/d*e^3*A*g^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c-1
```

```
/3/d^3*e^3*A*g^2*b^5/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3-2/3/d^3*e*B*g^2/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3-1/d^3*e*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)*b^3*c^3-1/6/d^3*e^2*B*g^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3-1/d^
2*B*g^2*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*d-b*e)*a*c^2*b+e^2*B*g^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*b+1/3*e^3*B*g^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3*b^2-1/3
*B*g^2/b*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*d-b*e)*a^3+1/6*e^2*B*g^2*b/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^2*a^3+1/3*e^3*A*g^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)^3*a^3+e^2*A*g^2*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3+1/d*B*g^2*ln((b*e/
d+(a*d-b*c)*e/d/(d*x+c))*d-b*e)*a^2*c+e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+1/3/d^3*B*g^2*b^2*ln((b*e/d+(a*d-b*c)*
e/d/(d*x+c))*d-b*e)*c^3+2/d^2*e*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*b^2*c
^2-1/2/d*e^2*B*g^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+3/d^2*e*A*g^2/
(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2*c^2*a-1/d^3*e^2*A*g^2*b^4/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^2*c^3+5*d*e^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2*c-2*d^2*e^3*B*g^2*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5/(d*x+c)^3*c+6/d*e*B*g^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2/(d*x+c)*c^2
*b-5/d^2*e^2*B*g^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^2*c^4/(d*x+c)^2*a-4/d^2*e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x+c)*a+5/d*e^3*B*g^2*b^3*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^4/(d*x+c)^3*a^2-2/d
^2*e^3*B*g^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)^3*c^5/(d*x+c)^3*a+3/d^2*e^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)^2*b^3*c^2*a+1/d^2*e^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^4*c^2*a-3/d*e^2*B*g^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*b^2*c-1/d*e^3*B*
g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*b^3
*c-d^2*e^2*B*g^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^2*a^5/(d*x+c)^2+1/d^3*e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)*c^4/(d*x+c)-20/3*e^3*B*g^2*b^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3/(d*x+c)^3*a^3-10*e^2*B*g
^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x
+c)^2*c^2*b-3/d*e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d
*x+c)*b*c)*a^2*c*b+3/d^2*e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)*a*c^2*b^2+d*e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^4/(d*x+c)+1/3*d^3*e^3*B*g^2/b*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+c)^3+1/d^3*e^2*B
*g^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^
5/(d*x+c)^2+1/3/d^3*e^3*B*g^2*b^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3+10/d*e^2*B*g^2*b^2*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^3+5*d*e^3*B*g^
2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4/(d*x+
c)^3*c^2*b
```

maxima [**B**]   time = 1.24, size = 280, normalized size = 2.37

$$\frac{1}{3}Ab^2g^2x^3+Aabg^2x^2+\Bigg(x\log\bigg(\frac{bex}{dx+c}+\frac{ae}{dx+c}\bigg)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\Bigg)Ba^2g^2+\Bigg(x^2\log\bigg(\frac{bex}{dx+c}+\frac{}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*B*a*b*g^2 + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
- 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

mupad [**B**] time = 4.48, size = 290, normalized size = 2.46

$$x^2 \left(\frac{b\,g^2\,\left(9\,A\,a\,d+3\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{6\,d}-\frac{A\,b\,g^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,d}\right)-x\,\Bigg(\frac{\left(3\,a\,d+3\,b\,c\right)\,\Big(\frac{b\,g^2\,\left(9\,A\,a\,d+3\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{3\,d}-}{3\,b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] x^2*((b*g^2*(9*A*a*d + 3*A*b*c + B*a*d - B*b*c))/(6*d) - (A*b*g^2*(3*a*d +
3*b*c))/(6*d)) - x*(((3*a*d + 3*b*c)*((b*g^2*(9*A*a*d + 3*A*b*c + B*a*d - B
*b*c))/(3*d) - (A*b*g^2*(3*a*d + 3*b*c))/(3*d)))/(3*b*d) - (a*g^2*(3*A*a*d
+ 3*A*b*c + B*a*d - B*b*c))/d + (A*a*b*c*g^2)/d) + log((e*(a + b*x))/(c + d
*x))*((B*b^2*g^2*x^3)/3 + B*a^2*g^2*x + B*a*b*g^2*x^2) - (log(c + d*x)*(B*b
^2*c^3*g^2 + 3*B*a^2*c*d^2*g^2 - 3*B*a*b*c^2*d*g^2))/(3*d^3) + (A*b^2*g^2*x
^3)/3 + (B*a^3*g^2*log(a + b*x))/(3*b)
```

sympy [**B**] time = 2.92, size = 491, normalized size = 4.16

$$\frac{Ab^2g^2x^3}{3}+\frac{Ba^3g^2\log\left(x+\frac{\frac{Ba^4d^3g^2}{b}+3Ba^3cd^2g^2-3Ba^2bc^2dg^2+Bab^2c^3g^2}{Ba^3d^3g^2+3Ba^2bcd^2g^2-3Bab^2c^2dg^2+Bb^3c^3g^2}\right)}{3b}-\frac{Bcg^2\left(3a^2d^2-3abcd+b^2c^2\right)\log\Bigg(x+\frac{4Ba^3cd^2g^2-3B}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**2*g**2*x**3/3 + B*a**3*g**2*log(x + (B*a**4*d**3*g**2/b + 3*B*a**3*c*d
**2*g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2)/(B*a**3*d**3*g**2 +
 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**2 + B*b**3*c**3*g**2))/(3*b)
 - B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (4*B*a**3*c*d**2*
g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2 - B*a*c*g**2*(3*a**2*d**
2 - 3*a*b*c*d + b**2*c**2) + B*b*c**2*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*
c**2)/d)/(B*a**3*d**3*g**2 + 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**
2 + B*b**3*c**3*g**2))/(3*d**3) + x**2*(A*a*b*g**2 + B*a*b*g**2/6 - B*b**2*
c*g**2/(6*d)) + x*(A*a**2*g**2 + 2*B*a**2*g**2/3 - B*a*b*c*g**2/d + B*b**2*
c**2*g**2/(3*d**2)) + (B*a**2*g**2*x + B*a*b*g**2*x**2 + B*b**2*g**2*x**3/3
)*log(e*(a + b*x)/(c + d*x))
```

3.91 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx$

Optimal. Leaf size=81

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}-\frac{Bgx(bc-ad)}{2d}$$

```
[Out] -1/2*B*(-a*d+b*c)*g*x/d+1/2*g*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b+1/2*B
*(-a*d+b*c)^2*g*ln(d*x+c)/b/d^2
```

Rubi [A] time = 0.05, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}-\frac{Bgx(bc-ad)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*x)/(2*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/(2*b) + (B*(b*c - a*d)^2*g*Log[c + d*x])/(2*b*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} - \frac{B\int\frac{(bc-ad)g^2(a+bx)}{c+dx}\,dx}{2bg} \\
&= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\frac{a+bx}{c+dx}\,dx}{2b} \\
&= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\left(\frac{b}{d}+\frac{-bc+ad}{d(c+dx)}\right)dx}{2b} \\
&= -\frac{B(bc-ad)gx}{2d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} + \frac{B(bc-ad)^2g\log}{2bd^2}
\end{aligned}$$

Mathematica [**A**] time = 0.03, size = 69, normalized size = 0.85

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{B(ad-bc)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*(-(b*c) + a*d)*(b
*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2))/(2*b)
```

fricas [**A**] time = 0.79, size = 125, normalized size = 1.54

$$\frac{Ab^2d^2gx^2 + Ba^2d^2g\log(bx+a) - \left(Bb^2cd - (2A+B)abd^2\right)gx + \left(Bb^2c^2 - 2Babcd\right)g\log(dx+c) + \left(Bb^2d^2gx^2 + \right.}{2bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + B*a^2*d^2*g*log(b*x + a) - (B*b^2*c*d - (2*A + B)*a*
b*d^2)*g*x + (B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^2 +
2*B*a*b*d^2*g*x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^2)
```

giac [**B**] time = 0.97, size = 1319, normalized size = 16.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] -1/2*(B*b^5*c^3*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 3*B*a*b^4*c^2
*d*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 3*B*a^2*b^3*c*d^2*g*e^3*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c)) - B*a^3*b^2*d^3*g*e^3*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c)) - 2*(b*x*e + a*e)*B*b^4*c^3*d*g*e^2*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)*B*a*b^3*c^2*d^2*g*e^2*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)*B*a^2*b^2*c*d^
3*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)*B
*a^3*b*d^4*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + (b*x*e +
 a*e)^2*B*b^3*c^3*d^2*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2
 - 3*(b*x*e + a*e)^2*B*a*b^2*c^2*d^3*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x +
c))/(d*x + c)^2 + 3*(b*x*e + a*e)^2*B*a^2*b*c*d^4*g*e*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^2 - (b*x*e + a*e)^2*B*a^3*d^5*g*e*log(-b*e + (b*
```

```
x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - (b*x*e + a*e)^2*B*b^3*c^3*d^2*g*e*log
((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 3*(b*x*e + a*e)^2*B*a*b^2*c^2*d^3*g
*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 3*(b*x*e + a*e)^2*B*a^2*b*c*d
^4*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + (b*x*e + a*e)^2*B*a^3*d^5
*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + A*b^5*c^3*g*e^3 + B*b^5*c^3
*g*e^3 - 3*A*a*b^4*c^2*d*g*e^3 - 3*B*a*b^4*c^2*d*g*e^3 + 3*A*a^2*b^3*c*d^2*
g*e^3 + 3*B*a^2*b^3*c*d^2*g*e^3 - A*a^3*b^2*d^3*g*e^3 - B*a^3*b^2*d^3*g*e^3
 - 2*(b*x*e + a*e)*A*b^4*c^3*d*g*e^2/(d*x + c) - (b*x*e + a*e)*B*b^4*c^3*d*
g*e^2/(d*x + c) + 6*(b*x*e + a*e)*A*a*b^3*c^2*d^2*g*e^2/(d*x + c) + 3*(b*x*
e + a*e)*B*a*b^3*c^2*d^2*g*e^2/(d*x + c) - 6*(b*x*e + a*e)*A*a^2*b^2*c*d^3*
g*e^2/(d*x + c) - 3*(b*x*e + a*e)*B*a^2*b^2*c*d^3*g*e^2/(d*x + c) + 2*(b*x*
e + a*e)*A*a^3*b*d^4*g*e^2/(d*x + c) + (b*x*e + a*e)*B*a^3*b*d^4*g*e^2/(d*x
 + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d
)))/(b^3*d^2*e^2 - 2*(b*x*e + a*e)*b^2*d^3*e/(d*x + c) + (b*x*e + a*e)^2*b*
d^4/(d*x + c)^2)
```

maple [**B**] time = 0.13, size = 1544, normalized size = 19.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] -1/2/d^2*B*g*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*d-b*e)*c^2*b+1/d*B*g*ln((b*e/
d+(a*d-b*c)*e/d/(d*x+c))*d-b*e)*c*a+1/2*e^2*A*g*b/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)^2*a^2+e*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)*a^2+1/2*e*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-1/2*B*g/b*ln((b*e/d+(a*
d-b*c)*e/d/(d*x+c))*d-b*e)*a^2+e*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-2/d*
e*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b*c*a+1/d^2*e*B*g*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*b^2+1/2/d^2*e^2*A*g*b^3/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)^2*c^2+1/d^2*e*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2
*c^2+1/2/d^2*e*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2*c^2+1/2*e^2*B*g*b*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2+1/2/d^2*e^2
*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*b^
3-3*e*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2
/(d*x+c)*c-1/d*e*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*b*c-1/d*e^2*A*g*b^2/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c+2/d*e^2*B*g*b^2*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a/(d*x+c)^2*c^3+3/d*e*B*g*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a/(d*x+c)*c^2*b-3*e^2*B
*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x
+c)^2*c^2*b-1/2*d^2*e^2*B*g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2-1/2/d^2*e^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*b^3-2/d*e*B*g*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c*b*a-1/d*e^2*B*g*b^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c-1/d^2*e
*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x
+c)*b^2+d*e*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)*a^3/(d*x+c)+2*d*e^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c
```

maxima [**A**] time = 1.46, size = 144, normalized size = 1.78

$$\frac{1}{2}Abgx^{2}+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)Bag+\frac{1}{2}\left(x^{2}\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b
- c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) -
```

```
a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*b*g +
A*a*g*x
```

mupad [B] time = 4.30, size = 126, normalized size = 1.56

$$x\,\left(\frac{g\,\left(4\,A\,a\,d+2\,A\,b\,c+B\,a\,d-B\,b\,c\right)}{2\,d}-\frac{A\,g\,\left(2\,a\,d+2\,b\,c\right)}{2\,d}\right)+\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(\frac{B\,b\,g\,x^2}{2}+B\,a\,g\,x\right)+\frac{\ln\left(c+d\,x\right)\,\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] x*((g*(4*A*a*d + 2*A*b*c + B*a*d - B*b*c))/(2*d) - (A*g*(2*a*d + 2*b*c))/(2
*d)) + log((e*(a + b*x))/(c + d*x))*((B*b*g*x^2)/2 + B*a*g*x) + (log(c + d*
x)*(B*b*c^2*g - 2*B*a*c*d*g))/(2*d^2) + (A*b*g*x^2)/2 + (B*a^2*g*log(a + b*
x))/(2*b)
```

sympy [B] time = 1.95, size = 253, normalized size = 3.12

$$\frac{Abgx^2}{2}+\frac{Ba^2g\log\left(x+\frac{\frac{Ba^3d^2g}{b}+2Ba^2cdg-Babc^2g}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{2b}-\frac{Bcg\left(2ad-bc\right)\log\left(x+\frac{3Ba^2cdg-Babc^2g-Bacg(2ad-bc)+\frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{2d^2}+x\left(A\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b*g*x**2/2 + B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/(2*b) - B*c*g*(2*a*
d - b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B
*b*c**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))
/(2*d**2) + x*(A*a*g + B*a*g/2 - B*b*c*g/(2*d)) + (B*a*g*x + B*b*g*x**2/2)*
log(e*(a + b*x)/(c + d*x))
```

3.92 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=80

$$\frac{B\operatorname{Li}_2\left(\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/g+B*polylog(2,1+(-a*
d+b*c)/d/(b*x+a))/b/g
```

Rubi [A] time = 0.22, antiderivative size = 120, normalized size of antiderivative = 1.50, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg}+\frac{B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}-\frac{B\log^2(g(a+bx}{2bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x),x]
```

```
[Out] -(B*Log[g*(a + b*x)]^2)/(2*b*g) + ((A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[a*g + b*g*x])/(b*g) + (B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/
(b*g) + (B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}\,dx &= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(ag+bgx)}{e(a+bx)}\,dx}{bg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(ag+bgx)}{a+bx}\,dx}{beg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \left(\frac{be\log(ag+bgx)}{a+bx}-\frac{de\log(ag+bgx)}{c+dx}\right)dx}{beg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g}+\frac{(Bd)\int \frac{\log(ag+bgx)}{c+dx}\,dx}{bg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}+\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}-B\int\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}+\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}-\frac{B\,\mathrm{Subst}\Big(\int}{}\\
&= -\frac{B\log^2(g(a+bx))}{2bg}+\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg}+\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+}{bg}
\end{aligned}
$$

Mathematica [A] time = 0.04, size = 95, normalized size = 1.19

$$
\frac{\log(g(a+bx))\left(2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)-B\log(g(a+bx))\right)+2B\,\mathrm{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)}{2bg}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x),x]
```

```
[Out] (Log[g*(a + b*x)]*(-(B*Log[g*(a + b*x)]) + 2*(A + B*Log[(e*(a + b*x))/(c +
d*x)] + B*Log[(b*(c + d*x))/(b*c - a*d)])) + 2*B*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)])/(2*b*g)
```

fricas [**F**] time = 0.98, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B\log\left(\frac{bex+ae}{dx+c}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*e*x + a*e)/(d*x + c)) + A)/(b*g*x + a*g), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 0.09, size = 602, normalized size = 7.52

$$-\frac{Bad\ln\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)d}{be}\right)\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{(ad-bc)\,bg}+\frac{Bad\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)^{2}}{2\,(ad-bc)\,bg}+\frac{Bc\ln\left(-\frac{-be+\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)d}{be}\right)\ln\left(\frac{be}{d}+\frac{(ad-bc}{(dx+c}\right.}{(ad-bc)\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] -d/g/(a*d-b*c)*A/b*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*a+1/g/(a*d-b*c)
*A*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*c+d/g/(a*d-b*c)*A/b*ln(b/d*e+(a
*d-b*c)/(d*x+c)/d*e)*a-1/g/(a*d-b*c)*A*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-d/
g/(a*d-b*c)*B/b*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*a+1/g/(a
*d-b*c)*B*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*c-d/g/(a*d-b*c
)*B/b*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*
e)*d)/b/e)*a+1/g/(a*d-b*c)*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-(-b*e+(b/d
*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*c+1/2*d/g/(a*d-b*c)*B*ln(b/d*e+(a*d-b*c)/
(d*x+c)/d*e)^2/b*a-1/2/g/(a*d-b*c)*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*c
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$-B\left(\frac{\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int\frac{bdx\log(e)+bc\log(e)+\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^{2}dgx^{2}+abcg+\left(b^{2}cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+a\right.}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] -B*(log(b*x + a)*log(d*x + c)/(b*g) - integrate((b*d*x*log(e) + b*c*log(e)
+ (2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a
*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))/(a*g + b*g*x), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A}{a+bx}\,dx + \int \frac{B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] (Integral(A/(a + b*x), x) + Integral(B*log(a*e/(c + d*x) + b*e*x/(c + d*x))
/(a + b*x), x))/g
```

3.93 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=63

$$-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{B}{bg^2(a+bx)}$$

```
[Out] -B/b/g^2/(b*x+a)-(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [A] time = 0.08, antiderivative size = 102, normalized size of antiderivative = 1.62, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{bg^2(a+bx)}-\frac{Bd\log(a+bx)}{bg^2(bc-ad)}+\frac{Bd\log(c+dx)}{bg^2(bc-ad)}-\frac{B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] -(B/(b*g^2*(a + b*x))) - (B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (A + B*Lo
g[(e*(a + b*x))/(c + d*x)])/(b*g^2*(a + b*x)) + (B*d*Log[c + d*x])/(b*(b*c
- a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)} + \frac{B\int \frac{bc-ad}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)} + \frac{(B(bc-ad))\int \frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)} + \frac{(B(bc-ad))\int \left(\frac{b}{(bc-ad)(a+bx)^2} - \frac{bd}{(bc-ad)^2(a+bx)} + \frac{d^2}{(bc-ad)^2(c+dx)}\right) d}{bg^2}$$

$$= -\frac{B}{bg^2(a+bx)} - \frac{Bd\log(a+bx)}{b(bc-ad)g^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)} + \frac{Bd\log(c+dx)}{b(bc-ad)g^2}$$

Mathematica [A] time = 0.06, size = 105, normalized size = 1.67

$$\frac{aAd+(aBd-bBc)\log\left(\frac{e(a+bx)}{c+dx}\right)-Bd(a+bx)\log(a+bx)+aBd\log(c+dx)+aBd-Abc+bBdx\log(c+dx)-b}{bg^2(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] (-(A*b*c) - b*B*c + a*A*d + a*B*d - B*d*(a + b*x)*Log[a + b*x] + (-(b*B*c)
+ a*B*d)*Log[(e*(a + b*x))/(c + d*x)] + a*B*d*Log[c + d*x] + b*B*d*x*Log[c
+ d*x])/(b*(b*c - a*d)*g^2*(a + b*x))
```

fricas [A] time = 1.37, size = 83, normalized size = 1.32

$$-\frac{(A+B)bc-(A+B)ad+(Bbdx+Bbc)\log\left(\frac{bex+ae}{dx+c}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="fricas")
```

```
[Out] -((A + B)*b*c - (A + B)*a*d + (B*b*d*x + B*b*c)*log((b*e*x + a*e)/(d*x + c)
))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d)*g^2)
```

giac [A] time = 1.30, size = 110, normalized size = 1.75

$$-\frac{\left(Be^2\log\left(\frac{bxe+ae}{dx+c}\right)+Ae^2+Be^2\right)(dx+c)\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)}{(bxe+ae)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] -(B*e^2*log((b*x*e + a*e)/(d*x + c)) + A*e^2 + B*e^2)*(d*x + c)*(b*c/((b*c*
e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)
*g^2)
```

maple [B] time = 0.05, size = 373, normalized size = 5.92

$$\frac{Bade\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{(ad-bc)^2\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)g^2}-\frac{Bbce\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{(ad-bc)^2\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)g^2}+\frac{Aade}{(ad-bc)^2\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)g^2}-\frac{}{(ad-b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x)
```

```
[Out] d*e/(a*d-b*c)^2/g^2*A/(b/d*e+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/(a*d-b*c)^2/g
^2*A/(b/d*e+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+d*e/(a*d-b*c)^2/g^2*B/(b/d*e+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a-e/(a*d-b*c)^2
/g^2*B/(b/d*e+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*
b*c+d*e/(a*d-b*c)^2/g^2*B/(b/d*e+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/(a*d-b*c)
^2/g^2*B/(b/d*e+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c
```

maxima [**B**] time = 1.09, size = 132, normalized size = 2.10

$$-B\left(\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{b^{2}g^{2}x+abg^{2}}+\frac{1}{b^{2}g^{2}x+abg^{2}}+\frac{d\log\left(bx+a\right)}{\left(b^{2}c-abd\right)g^{2}}-\frac{d\log\left(dx+c\right)}{\left(b^{2}c-abd\right)g^{2}}\right)-\frac{A}{b^{2}g^{2}x+abg^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="maxima")
```

```
[Out] -B*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2
*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2
*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

mupad [**B**] time = 5.02, size = 104, normalized size = 1.65

$$-\frac{A+B}{x\,b^{2}\,g^{2}+a\,b\,g^{2}}-\frac{B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{b^{2}\,g^{2}\,\left(x+\frac{a}{b}\right)}-\frac{B\,d\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{b\,g^{2}\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(a*g + b*g*x)^2,x)
```

```
[Out] - (A + B)/(b^2*g^2*x + a*b*g^2) - (B*log((e*(a + b*x))/(c + d*x)))/(b^2*g^2
*(x + a/b)) - (B*d*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*2i)/(b*g^2*(a
*d - b*c))
```

sympy [**B**] time = 1.58, size = 233, normalized size = 3.70

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{abg^{2}+b^{2}g^{2}x}-\frac{Bd\log\left(x+\frac{-\frac{Ba^{2}d^{3}}{ad-bc}+\frac{2Babcd^{2}}{ad-bc}+Bad^{2}-\frac{Bb^{2}c^{2}d}{ad-bc}+Bbcd}{2Bbd^{2}}\right)}{bg^{2}\left(ad-bc\right)}+\frac{Bd\log\left(x+\frac{\frac{Ba^{2}d^{3}}{ad-bc}-\frac{2Babcd^{2}}{ad-bc}+Bad^{2}+\frac{Bb^{2}c^{2}d}{ad-bc}+Bbcd}{2Bbd^{2}}\right)}{bg^{2}\left(ad-bc\right)}+\frac{-}{abg^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(a*b*g**2 + b**2*g**2*x) - B*d*log(x + (-B*a*
*2*d**3/(a*d - b*c) + 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 - B*b**2*c**2*d
/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) + B*d*log(x + (B
*a**2*d**3/(a*d - b*c) - 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 + B*b**2*c**
2*d/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) + (-A - B)/(a
*b*g**2 + b**2*g**2*x)
```

3.94 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=144

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}+\frac{Bd}{2bg^3(a+bx)(bc-ad)}-\frac{B}{4bg^3(a+bx)^2}$$

```
[Out] -1/4*B/b/g^3/(b*x+a)^2+1/2*B*d/b/(-a*d+b*c)/g^3/(b*x+a)+1/2*B*d^2*ln(b*x+a)
/b/(-a*d+b*c)^2/g^3+1/2*(-A-B*ln(e*(b*x+a)/(d*x+c)))/b/g^3/(b*x+a)^2-1/2*B*
d^2*ln(d*x+c)/b/(-a*d+b*c)^2/g^3
```

Rubi [A] time = 0.10, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}+\frac{Bd}{2bg^3(a+bx)(bc-ad)}-\frac{B}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] -B/(4*b*g^3*(a + b*x)^2) + (B*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (B*d^2*L
og[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])
/(2*b*g^3*(a + b*x)^2) - (B*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}+\frac{B\int \frac{bc-ad}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int \frac{1}{(a+bx)^3(c+dx)}\,dx}{2bg^3}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int \left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}\right.}{2bg^3}\\ &= -\frac{B}{4bg^3(a+bx)^2}+\frac{Bd}{2b(bc-ad)g^3(a+bx)}+\frac{Bd^2\log(a+bx)}{2b(bc-ad)^2g^3}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}\end{aligned}$$

Mathematica [**A**]   time = 0.13, size = 110, normalized size = 0.76

$$-\frac{2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{B\left(2d^2(a+bx)^2\log(c+dx)+(bc-ad)(b(c-2dx)-3ad)-2d^2(a+bx)^2\log(a+bx)\right)}{(bc-ad)^2}}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] -1/4*(2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*((b*c - a*d)*(-3*a*d + b*
(c - 2*d*x)) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d
*x]))/(b*c - a*d)^2)/(b*g^3*(a + b*x)^2)
```

fricas [**A**]   time = 0.61, size = 217, normalized size = 1.51

$$-\frac{(2A+B)b^2c^2-4(A+B)abcd+(2A+3B)a^2d^2-2\left(Bb^2cd-Babd^2\right)x-2\left(Bb^2d^2x^2+2Babd^2x-Bb^2c^2+2\right.}{4\left(\left(b^5c^2-2ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2a^3b^2cd+a^4\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^2*c^2 - 4*(A + B)*a*b*c*d + (2*A + 3*B)*a^2*d^2 - 2*(B*b^
2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a
*b*c*d)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2
)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^
2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [**A**]   time = 1.69, size = 237, normalized size = 1.65

$$-\frac{\left(2Bbe^3\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{4(bxe+ae)Bde^2\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+2Abe^3+Bbe^3-\frac{4(bxe+ae)Ade^2}{dx+c}-\frac{4(bxe+ae)Bde^2}{dx+c}\right)\left(\frac{bc}{(bce-ade)(bc-ad)}-\right.}{4\left(\frac{(bxe+ae)^2bcg^3}{(dx+c)^2}-\frac{(bxe+ae)^2adg^3}{(dx+c)^2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] -1/4*(2*B*b*e^3*log((b*x*e + a*e)/(d*x + c)) - 4*(b*x*e + a*e)*B*d*e^2*log(
(b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*A*b*e^3 + B*b*e^3 - 4*(b*x*e + a*e)*
A*d*e^2/(d*x + c) - 4*(b*x*e + a*e)*B*d*e^2/(d*x + c))*(b*c/((b*c*e - a*d*e
```

```
)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^2*b*c*g^
3/(d*x + c)^2 - (b*x*e + a*e)^2*a*d*g^3/(d*x + c)^2)
```

maple [B] time = 0.05, size = 777, normalized size = 5.40

$$-\frac{Babd\,e^{2}\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{2\,(ad-bc)^{3}\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)^{2}g^{3}}+\frac{B\,b^{2}c\,e^{2}\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{2\,(ad-bc)^{3}\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)^{2}g^{3}}-\frac{Aabd\,e^{2}}{2\,(ad-bc)^{3}\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)^{2}g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x)
```

```
[Out] d^2*e/(a*d-b*c)^3/g^3*A/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-d*e/(a*d-
b*c)^3/g^3*A/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c-1/2*d*e^2/(a*d-b*c
)^3/g^3*A*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+1/2*e^2/(a*d-b*c)^3
/g^3*A*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+d^2*e/(a*d-b*c)^3/g^
3*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)
*a-d*e/(a*d-b*c)^3/g^3*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(
a*d-b*c)/(d*x+c)/d*e)*b*c+d^2*e/(a*d-b*c)^3/g^3*B/(1/(d*x+c)*a*e-1/(d*x+c)*
b*c/d*e+b/d*e)*a-d*e/(a*d-b*c)^3/g^3*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d
*e)*b*c-1/2*d*e^2/(a*d-b*c)^3/g^3*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*
e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+1/2*e^2/(a*d-b*c)^3/g^3*B*b^2/(1/(d*
x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-1/4*d
*e^2/(a*d-b*c)^3/g^3*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+1/4*e^
2/(a*d-b*c)^3/g^3*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c
```

maxima [A] time = 1.26, size = 255, normalized size = 1.77

$$\frac{1}{4}B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^{4}c-ab^{3}d\right)g^{3}x^{2}+2\left(ab^{3}c-a^{2}b^{2}d\right)g^{3}x+\left(a^{2}b^{2}c-a^{3}bd\right)g^{3}}-\frac{2\,\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{b^{3}g^{3}x^{2}+2\,ab^{2}g^{3}x+a^{2}bg^{3}}+\frac{2\,d^{2}\log(b}{\left(b^{3}c^{2}-2\,ab^{2}cd\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="maxima")
```

```
[Out] 1/4*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(
d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((
b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*
a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g
^3)
```

mupad [B] time = 5.04, size = 209, normalized size = 1.45

$$-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c+3\,B\,a\,d-B\,b\,c}{2\,(a\,d-b\,c)}+\frac{B\,b\,d\,x}{a\,d-b\,c}}{2\,a^{2}\,b\,g^{3}+4\,a\,b^{2}\,g^{3}\,x+2\,b^{3}\,g^{3}\,x^{2}}-\frac{B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}{2\,b^{2}\,g^{3}\,\left(2\,a\,x+b\,x^{2}+\frac{a^{2}}{b}\right)}-\frac{B\,d^{2}\,\mathrm{atanh}\left(\frac{2\,b^{3}\,c^{2}\,g^{3}-2\,a^{2}\,b\,d^{2}\,g^{3}}{2\,b\,g^{3}\,(a\,d-b\,c)^{2}}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{b\,g^{3}\,(a\,d-b\,c)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(a*g + b*g*x)^3,x)
```

```
[Out] - ((2*A*a*d - 2*A*b*c + 3*B*a*d - B*b*c)/(2*(a*d - b*c)) + (B*b*d*x)/(a*d -
 b*c))/(2*a^2*b*g^3 + 2*b^3*g^3*x^2 + 4*a*b^2*g^3*x) - (B*log((e*(a + b*x))
/(c + d*x)))/(2*b^2*g^3*(2*a*x + b*x^2 + a^2/b)) - (B*d^2*atanh((2*b^3*c^2*
g^3 - 2*a^2*b*d^2*g^3)/(2*b*g^3*(a*d - b*c)^2) - (2*b*d*x)/(a*d - b*c)))/(b
*g^3*(a*d - b*c)^2)
```

sympy [B] time = 2.71, size = 422, normalized size = 2.93

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}-\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{2bg^3\left(ad-bc\right)^2}+\frac{Bd^2\log\left(x+\frac{Ba^3d^5}{(ad-bc)^2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b**3*g**
3*x**2) - B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*d**4/(
a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b**3*c**
3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2)
 + B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d - b*
c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d**2/(
a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + (-2*A
*a*d + 2*A*b*c - 3*B*a*d + B*b*c - 2*B*b*d*x)/(4*a**3*b*d*g**3 - 4*a**2*b**
2*c*g**3 + x**2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 -
 8*a*b**3*c*g**3))
```

3.95 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=175

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}-$$

```
[Out] -1/9*B/b/g^4/(b*x+a)^3+1/6*B*d/b/(-a*d+b*c)/g^4/(b*x+a)^2-1/3*B*d^2/b/(-a*d
+b*c)^2/g^4/(b*x+a)-1/3*B*d^3*ln(b*x+a)/b/(-a*d+b*c)^3/g^4+1/3*(-A-B*ln(e*(
b*x+a)/(d*x+c)))/b/g^4/(b*x+a)^3+1/3*B*d^3*ln(d*x+c)/b/(-a*d+b*c)^3/g^4
```

Rubi [A] time = 0.13, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^4,x]
```

```
[Out] -B/(9*b*g^4*(a + b*x)^3) + (B*d)/(6*b*(b*c - a*d)*g^4*(a + b*x)^2) - (B*d^2
)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (B*d^3*Log[a + b*x])/(3*b*(b*c - a*d)
^3*g^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(3*b*g^4*(a + b*x)^3) + (B*d
^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bg^4(a+bx)^3}+\frac{B\int\frac{bc-ad}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bg^4(a+bx)^3}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bg^4(a+bx)^3}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)}\right.}{3bg^4}\\ &= -\frac{B}{9bg^4(a+bx)^3}+\frac{Bd}{6b(bc-ad)g^4(a+bx)^2}-\frac{Bd^2}{3b(bc-ad)^2g^4(a+bx)}-\frac{Bd^3\log(a+}{3b(bc-ad}\end{aligned}$$

Mathematica [**A**] time = 0.16, size = 141, normalized size = 0.81

$$-\frac{\frac{B\left((bc-ad)\left(11a^2d^2+abd(15dx-7c)+b^2\left(2c^2-3cdx+6d^2x^2\right)\right)-6d^3(a+bx)^3\log(c+dx)+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}+6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{18bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^4,x]
```

```
[Out] -1/18*(6*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*((b*c - a*d)*(11*a^2*d^2
 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)) + 6*d^3*(a +
b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(b*g^
4*(a + b*x)^3)
```

fricas [**B**] time = 0.61, size = 406, normalized size = 2.32

$$-\frac{2\,(3\,A+B)b^3c^3-9\,(2\,A+B)ab^2c^2d+18\,(A+B)a^2bcd^2-(6\,A+11\,B)a^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)x^2-3\left(Bb\right.}{18\left(\left(b^7c^3-3\,ab^6c^2d+3\,a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3\,a^2b^5c^2d+3\,a^3b^4cd^2-a^4b^3d^3\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="fricas")
```

```
[Out] -1/18*(2*(3*A + B)*b^3*c^3 - 9*(2*A + B)*a*b^2*c^2*d + 18*(A + B)*a^2*b*c*d
^2 - (6*A + 11*B)*a^3*d^3 + 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^
2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 6*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3
*x^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log
((b*e*x + a*e)/(d*x + c)))/((b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4
*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^
5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b
*d^3)*g^4)
```

giac [**B**] time = 2.13, size = 382, normalized size = 2.18

$$-\frac{\left(6\,Bb^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{18\,(bxe+ae)Bbde^3\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{18\,(bxe+ae)^2Bd^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}+6\,Ab^2e^4+2\,Bb^2e^4-\frac{18\,(bxe+ae)Abde}{dx+c}\right.}{18\left(\frac{(bxe+ae)^3b^2c^2g^4}{(dx+c)^3}-\frac{2\,(bxe+ae)^3abcdg^4}{(dx+c)^3}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] -1/18*(6*B*b^2*e^4*log((b*x*e + a*e)/(d*x + c)) - 18*(b*x*e + a*e)*B*b*d*e^
3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 18*(b*x*e + a*e)^2*B*d^2*e^2*log
((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 6*A*b^2*e^4 + 2*B*b^2*e^4 - 18*(b*x
*e + a*e)*A*b*d*e^3/(d*x + c) - 9*(b*x*e + a*e)*B*b*d*e^3/(d*x + c) + 18*(b
*x*e + a*e)^2*A*d^2*e^2/(d*x + c)^2 + 18*(b*x*e + a*e)^2*B*d^2*e^2/(d*x + c
)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d))
)/((b*x*e + a*e)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x*e + a*e)^3*a*b*c*d*g^4/
(d*x + c)^3 + (b*x*e + a*e)^3*a^2*d^2*g^4/(d*x + c)^3)
```

maple [B] time = 0.05, size = 1191, normalized size = 6.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x)
```

```
[Out] d^3*e/(a*d-b*c)^4/g^4*A/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-d^2*e/(a*
d-b*c)^4/g^4*A/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c-d^2*e^2/(a*d-b*c
)^4/g^4*A*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+d*e^2/(a*d-b*c)^4/g
^4*A*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+1/3*d*e^3/(a*d-b*c)^4/
g^4*A*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-1/3*e^3/(a*d-b*c)^4/g
^4*A*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*c+d^3*e/(a*d-b*c)^4/g^4*
B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a
-d^2*e/(a*d-b*c)^4/g^4*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(
a*d-b*c)/(d*x+c)/d*e)*b*c+d^3*e/(a*d-b*c)^4/g^4*B/(1/(d*x+c)*a*e-1/(d*x+c)*
b*c/d*e+b/d*e)*a-d^2*e/(a*d-b*c)^4/g^4*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b
/d*e)*b*c-d^2*e^2/(a*d-b*c)^4/g^4*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*
e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+d*e^2/(a*d-b*c)^4/g^4*B*b^2/(1/(d*x+
c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-1/2*d^2
*e^2/(a*d-b*c)^4/g^4*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+1/2*d*
e^2/(a*d-b*c)^4/g^4*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+1/3*d
*e^3/(a*d-b*c)^4/g^4*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d
*e+(a*d-b*c)/(d*x+c)/d*e)*a-1/3*e^3/(a*d-b*c)^4/g^4*B*b^3/(1/(d*x+c)*a*e-1/
(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c+1/9*d*e^3/(a*d-b
*c)^4/g^4*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-1/9*e^3/(a*d-b*
c)^4/g^4*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*c
```

maxima [B] time = 1.36, size = 428, normalized size = 2.45

$$-\frac{1}{18}\,B\left(\frac{6\,b^{2}d^{2}x^{2}+2\,b^{2}c^{2}-7\,abcd+11\,a^{2}d^{2}-3\left(b^{2}cd-5\,abd^{2}\right)x}{\left(b^{6}c^{2}-2\,ab^{5}cd+a^{2}b^{4}d^{2}\right)g^{4}x^{3}+3\left(ab^{5}c^{2}-2\,a^{2}b^{4}cd+a^{3}b^{3}d^{2}\right)g^{4}x^{2}+3\left(a^{2}b^{4}c^{2}-2\,a^{3}b^{3}cd+a^{4}b^{2}d^{2}\right)g^{4}x+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="maxima")
```

```
[Out] -1/18*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*lo
g(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^
2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*
d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x
^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

mupad [B] time = 5.58, size = 339, normalized size = 1.94

$$\frac{2\,A\,a\,c\,d}{3\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{A\,b\,c^2}{3\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{B\,b\,c^2}{9\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{A\,a^2\,d^2}{3\,b\,g^4\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(a*g + b*g*x)^4,x)
```

```
[Out] (2*A*a*c*d)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) - (B*d^3*atan((a*d*1i + b*c*1
i + b*d*x*2i)/(a*d - b*c))*2i)/(3*b*g^4*(a*d - b*c)^3) - (A*b*c^2)/(3*g^4*(
a*d - b*c)^2*(a + b*x)^3) - (B*b*c^2)/(9*g^4*(a*d - b*c)^2*(a + b*x)^3) - (
A*a^2*d^2)/(3*b*g^4*(a*d - b*c)^2*(a + b*x)^3) - (11*B*a^2*d^2)/(18*b*g^4*(
a*d - b*c)^2*(a + b*x)^3) - (5*B*a*d^2*x)/(6*g^4*(a*d - b*c)^2*(a + b*x)^3)
 - (B*b*d^2*x^2)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) - (B*log((e*(a + b*x))/(
c + d*x)))/(3*b*g^4*(a + b*x)^3) + (7*B*a*c*d)/(18*g^4*(a*d - b*c)^2*(a + b
*x)^3) + (B*b*c*d*x)/(6*g^4*(a*d - b*c)^2*(a + b*x)^3)
```

sympy [B] time = 4.25, size = 656, normalized size = 3.75

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}-\frac{Bd^3\log\left(x+\frac{-\frac{Ba^4d^7}{(ad-bc)^3}+\frac{4Ba^3bcd^6}{(ad-bc)^3}-\frac{6Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{4Bab^3c^3d^4}{(ad-bc)^3}+Bad^4-\frac{Bb^4c^4d^3}{(ad-bc)^3}+Bbcd^3}{2Bbd^4}\right)}{3bg^4\left(ad-bc\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9*a*b**
3*g**4*x**2 + 3*b**4*g**4*x**3) - B*d**3*log(x + (-B*a**4*d**7/(a*d - b*c)*
*3 + 4*B*a**3*b*c*d**6/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5/(a*d - b*c)
**3 + 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + B*a*d**4 - B*b**4*c**4*d**3/(a*
d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) + B*d**3*
log(x + (B*a**4*d**7/(a*d - b*c)**3 - 4*B*a**3*b*c*d**6/(a*d - b*c)**3 + 6*
B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3
+ B*a*d**4 + B*b**4*c**4*d**3/(a*d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3
*b*g**4*(a*d - b*c)**3) + (-6*A*a**2*d**2 + 12*A*a*b*c*d - 6*A*b**2*c**2 -
11*B*a**2*d**2 + 7*B*a*b*c*d - 2*B*b**2*c**2 - 6*B*b**2*d**2*x**2 + x*(-15*
B*a*b*d**2 + 3*B*b**2*c*d))/(18*a**5*b*d**2*g**4 - 36*a**4*b**2*c*d*g**4 +
18*a**3*b**3*c**2*g**4 + x**3*(18*a**2*b**4*d**2*g**4 - 36*a*b**5*c*d*g**4
+ 18*b**6*c**2*g**4) + x**2*(54*a**3*b**3*d**2*g**4 - 108*a**2*b**4*c*d*g**
4 + 54*a*b**5*c**2*g**4) + x*(54*a**4*b**2*d**2*g**4 - 108*a**3*b**3*c*d*g*
*4 + 54*a**2*b**4*c**2*g**4))
```

3.96 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=206

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{}{12bg}$$

```
[Out] -1/16*B/b/g^5/(b*x+a)^4+1/12*B*d/b/(-a*d+b*c)/g^5/(b*x+a)^3-1/8*B*d^2/b/(-a
*d+b*c)^2/g^5/(b*x+a)^2+1/4*B*d^3/b/(-a*d+b*c)^3/g^5/(b*x+a)+1/4*B*d^4*ln(b
*x+a)/b/(-a*d+b*c)^4/g^5+1/4*(-A-B*ln(e*(b*x+a)/(d*x+c)))/b/g^5/(b*x+a)^4-1
/4*B*d^4*ln(d*x+c)/b/(-a*d+b*c)^4/g^5
```

Rubi [A] time = 0.16, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = $\{2525, 12, 44\}$

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{}{12bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] -B/(16*b*g^5*(a + b*x)^4) + (B*d)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d
^2)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3)/(4*b*(b*c - a*d)^3*g^5*(a
 + b*x)) + (B*d^4*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(a
+ b*x))/(c + d*x)])/(4*b*g^5*(a + b*x)^4) - (B*d^4*Log[c + d*x])/(4*b*(b*c
- a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4bg^5(a+bx)^4} + \frac{B\int\frac{bc-ad}{g^4(a+bx)^5(c+dx)}\,dx}{4bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int\frac{1}{(a+bx)^5(c+dx)}\,dx}{4bg^5}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^5} - \frac{bd}{(bc-ad)^2(a+bx)^4} + \frac{bd^2}{(bc-ad)^3(a+bx)}\right.}{4bg^5}$$

$$= -\frac{B}{16bg^5(a+bx)^4} + \frac{Bd}{12b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2}{8b(bc-ad)^2g^5(a+bx)^2} + \frac{}{4b(bc-}$$

Mathematica [**A**]   time = 0.21, size = 158, normalized size = 0.77

$$\frac{\frac{B\left(\frac{12d^3(bc-ad)}{a+bx}-\frac{6d^2(bc-ad)^2}{(a+bx)^2}+\frac{4d(bc-ad)^3}{(a+bx)^3}-\frac{3(bc-ad)^4}{(a+bx)^4}+12d^4\log(a+bx)-12d^4\log(c+dx)\right)}{12(bc-ad)^4}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{(a+bx)^4}}{4bg^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^4) + (B*((-3*(b*c - a*d)^
4)/(a + b*x)^4 + (4*d*(b*c - a*d)^3)/(a + b*x)^3 - (6*d^2*(b*c - a*d)^2)/(a
 + b*x)^2 + (12*d^3*(b*c - a*d))/(a + b*x) + 12*d^4*Log[a + b*x] - 12*d^4*L
og[c + d*x]))/(12*(b*c - a*d)^4))/(4*b*g^5)
```

fricas [**B**]   time = 3.02, size = 629, normalized size = 3.05

$$-\frac{3\,(4\,A+B)b^4c^4-16\,(3\,A+B)ab^3c^3d+36\,(2\,A+B)a^2b^2c^2d^2-48\,(A+B)a^3bcd^3+(12\,A+25\,B)a^4d^4-12\,(}{48\left(\left(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\right)g^5x^4+4\left(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="fricas")
```

```
[Out] -1/48*(3*(4*A + B)*b^4*c^4 - 16*(3*A + B)*a*b^3*c^3*d + 36*(2*A + B)*a^2*b^
2*c^2*d^2 - 48*(A + B)*a^3*b*c*d^3 + (12*A + 25*B)*a^4*d^4 - 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 12*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*
B*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3
*b*c*d^3)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b
^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*
b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*
(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*
b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4
*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^
6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

giac [**B**]   time = 2.04, size = 528, normalized size = 2.56

$$-\frac{\left(12\,Bb^3e^5\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{48\,(bxe+ae)Bb^2de^4\log\left(\frac{bxe+ae}{dx+c}\right)}{dx+c}+\frac{72\,(bxe+ae)^2Bbd^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^2}-\frac{48\,(bxe+ae)^3Bd^3e^2\log\left(\frac{bxe+ae}{dx+c}\right)}{(dx+c)^3}+12\,A\right.}{48\left(\frac{(bxe+ae)^4b^3}{(dx+c)^4}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] -1/48*(12*B*b^3*e^5*log((b*x*e + a*e)/(d*x + c)) - 48*(b*x*e + a*e)*B*b^2*d
*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 72*(b*x*e + a*e)^2*B*b*d^2*e^
3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 48*(b*x*e + a*e)^3*B*d^3*e^2*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 12*A*b^3*e^5 + 3*B*b^3*e^5 - 48*(
b*x*e + a*e)*A*b^2*d*e^4/(d*x + c) - 16*(b*x*e + a*e)*B*b^2*d*e^4/(d*x + c)
 + 72*(b*x*e + a*e)^2*A*b*d^2*e^3/(d*x + c)^2 + 36*(b*x*e + a*e)^2*B*b*d^2*
e^3/(d*x + c)^2 - 48*(b*x*e + a*e)^3*A*d^3*e^2/(d*x + c)^3 - 48*(b*x*e + a*
e)^3*B*d^3*e^2/(d*x + c)^3)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*
e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x*
e + a*e)^4*a*b^2*c^2*d*g^5/(d*x + c)^4 + 3*(b*x*e + a*e)^4*a^2*b*c*d^2*g^5/
(d*x + c)^4 - (b*x*e + a*e)^4*a^3*d^3*g^5/(d*x + c)^4)
```

maple [B] time = 0.05, size = 1607, normalized size = 7.80

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x)
```

```
[Out] d^4*e/(a*d-b*c)^5/g^5*A/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-d^3*e/(a*
d-b*c)^5/g^5*A/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c-3/2*d^3*e^2/(a*d
-b*c)^5/g^5*A*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+3/2*d^2*e^2/(a*
d-b*c)^5/g^5*A*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+d^2*e^3/(a*d
-b*c)^5/g^5*A*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-d*e^3/(a*d-b*
c)^5/g^5*A*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*c-1/4*d*e^4/(a*d-b
*c)^5/g^5*A*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*a+1/4*e^4/(a*d-b*
c)^5/g^5*A*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*c+d^4*e/(a*d-b*c)^
5/g^5*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/
d*e)*a-d^3*e/(a*d-b*c)^5/g^5*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b
/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c+d^4*e/(a*d-b*c)^5/g^5*B/(1/(d*x+c)*a*e-1/(d
*x+c)*b*c/d*e+b/d*e)*a-d^3*e/(a*d-b*c)^5/g^5*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c
/d*e+b/d*e)*b*c-3/2*d^3*e^2/(a*d-b*c)^5/g^5*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*
c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+3/2*d^2*e^2/(a*d-b*c)^5/g^
5*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c
)/d*e)*c-3/4*d^3*e^2/(a*d-b*c)^5/g^5*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b
/d*e)^2*a+3/4*d^2*e^2/(a*d-b*c)^5/g^5*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*
e+b/d*e)^2*c+d^2*e^3/(a*d-b*c)^5/g^5*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e
+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a-d*e^3/(a*d-b*c)^5/g^5*B*b^3/(1/
(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c+1/
3*d^2*e^3/(a*d-b*c)^5/g^5*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a
-1/3*d*e^3/(a*d-b*c)^5/g^5*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*
c-1/4*d*e^4/(a*d-b*c)^5/g^5*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4
*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+1/4*e^4/(a*d-b*c)^5/g^5*B*b^4/(1/(d*x+c)
*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-1/16*d*e^
4/(a*d-b*c)^5/g^5*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*a+1/16*e^
4/(a*d-b*c)^5/g^5*B*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*c
```

maxima [B] time = 1.54, size = 647, normalized size = 3.14

$$\frac{1}{48}B\left(\frac{12\,b^3d^3x^3-3\,b^3c^3+13\,ab^2c^2d-23\,a^2bcd^2}{\left(b^8c^3-3\,ab^7c^2d+3\,a^2b^6cd^2-a^3b^5d^3\right)g^5x^4+4\left(ab^7c^3-3\,a^2b^6c^2d+3\,a^3b^5cd^2-a^4b^4d^3\right)g^5x^3+6\left(a^2b^6c^3-\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="maxima")
```

```
[Out] 1/48*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*
a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)
*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*
g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)
*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3
)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5
) - 12*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((
b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*
g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 +
 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

mupad **[B]** time = 6.17, size = 577, normalized size = 2.80

$$-\frac{\frac{12\,A\,a^3\,d^3-12\,A\,b^3\,c^3+25\,B\,a^3\,d^3-3\,B\,b^3\,c^3+36\,A\,a\,b^2\,c^2\,d-36\,A\,a^2\,b\,c\,d^2+13\,B\,a\,b^2\,c^2\,d-23\,B\,a^2\,b\,c\,d^2}{12\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}-\frac{d^2\,x^2\,\left(B\,b^3\,c-7\,B\,a\,b^2\,d\right)}{2\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}+}{4\,a^4\,b\,g^5+16\,a^3\,b^2\,g^5\,x+24\,a^2\,b^3\,g^5\,x^2+16\,a\,b^4\,g^5\,x^3+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(a*g + b*g*x)^5,x)
```

```
[Out] - ((12*A*a^3*d^3 - 12*A*b^3*c^3 + 25*B*a^3*d^3 - 3*B*b^3*c^3 + 36*A*a*b^2*c
^2*d - 36*A*a^2*b*c*d^2 + 13*B*a*b^2*c^2*d - 23*B*a^2*b*c*d^2)/(12*(a^3*d^3
 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (d^2*x^2*(B*b^3*c - 7*B*a*b^
2*d))/(2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d*x*(B*b^3
*c^2 + 13*B*a^2*b*d^2 - 5*B*a*b^2*c*d))/(3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2)) + (B*b^3*d^3*x^3)/(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d -
 3*a^2*b*c*d^2))/(4*a^4*b*g^5 + 4*b^5*g^5*x^4 + 16*a^3*b^2*g^5*x + 16*a*b^4
*g^5*x^3 + 24*a^2*b^3*g^5*x^2) - (B*log((e*(a + b*x))/(c + d*x)))/(4*b^2*g^
5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3)) - (B*d^4*atanh((
4*b^5*c^4*g^5 - 4*a^4*b*d^4*g^5 - 8*a*b^4*c^3*d*g^5 + 8*a^3*b^2*c*d^3*g^5)/
(4*b*g^5*(a*d - b*c)^4) - (2*b*d*x*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a
^2*b*c*d^2))/(a*d - b*c)^4))/(2*b*g^5*(a*d - b*c)^4)
```

sympy **[B]** time = 5.93, size = 944, normalized size = 4.58

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4a^4bg^5+16a^3b^2g^5x+24a^2b^3g^5x^2+16ab^4g^5x^3+4b^5g^5x^4}-\frac{Bd^4\log\left(x+\frac{-\frac{Ba^5d^9}{(ad-bc)^4}+\frac{5Ba^4bcd^8}{(ad-bc)^4}-\frac{10Ba^3b^2c^2d^7}{(ad-bc)^4}+\frac{10Ba^2b^3c^3d^6}{(ad-bc)^4}}{2Bbd^5}\right.}{4bg^5\left(ad-bc\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x + 24*a**
2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) - B*d**4*log(x +
 (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10*B*a**
3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4 -
 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a*d - b
*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) + B*d**4*log(x
 + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 10*B*a*
*3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4
+ 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(a*d -
b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) + (-12*A*a**3
*d**3 + 36*A*a**2*b*c*d**2 - 36*A*a*b**2*c**2*d + 12*A*b**3*c**3 - 25*B*a**
3*d**3 + 23*B*a**2*b*c*d**2 - 13*B*a*b**2*c**2*d + 3*B*b**3*c**3 - 12*B*b**
```

```
3*d**3*x**3 + x**2*(-42*B*a*b**2*d**3 + 6*B*b**3*c*d**2) + x*(-52*B*a**2*b*
d**3 + 20*B*a*b**2*c*d**2 - 4*B*b**3*c**2*d))/(48*a**7*b*d**3*g**5 - 144*a*
*6*b**2*c*d**2*g**5 + 144*a**5*b**3*c**2*d*g**5 - 48*a**4*b**4*c**3*g**5 +
x**4*(48*a**3*b**5*d**3*g**5 - 144*a**2*b**6*c*d**2*g**5 + 144*a*b**7*c**2*
d*g**5 - 48*b**8*c**3*g**5) + x**3*(192*a**4*b**4*d**3*g**5 - 576*a**3*b**5
*c*d**2*g**5 + 576*a**2*b**6*c**2*d*g**5 - 192*a*b**7*c**3*g**5) + x**2*(28
8*a**5*b**3*d**3*g**5 - 864*a**4*b**4*c*d**2*g**5 + 864*a**3*b**5*c**2*d*g*
*5 - 288*a**2*b**6*c**3*g**5) + x*(192*a**6*b**2*d**3*g**5 - 576*a**5*b**3*
c*d**2*g**5 + 576*a**4*b**4*c**2*d*g**5 - 192*a**3*b**5*c**3*g**5))
```

3.97 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \, dx$

Optimal. Leaf size=365

$$\frac{Bg^4(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(12B\log\left(\frac{e(a+bx)}{c+dx}\right)+12A+25B\right)}{30bd^5}+\frac{Bg^4(a+bx)(bc-ad)^4\Big(12B\log\left(\frac{e(a+bx)}{c+dx}\right)+12A}{30bd^4}$$

```
[Out] -1/10*B*(-a*d+b*c)*g^4*(b*x+a)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d+1/5*g^4*(b
*x+a)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b+1/30*B*(-a*d+b*c)^2*g^4*(b*x+a)^3*(
4*A+B+4*B*ln(e*(b*x+a)/(d*x+c)))/b/d^2-1/60*B*(-a*d+b*c)^3*g^4*(b*x+a)^2*(1
2*A+7*B+12*B*ln(e*(b*x+a)/(d*x+c)))/b/d^3+1/30*B*(-a*d+b*c)^4*g^4*(b*x+a)*(
12*A+13*B+12*B*ln(e*(b*x+a)/(d*x+c)))/b/d^4+1/30*B*(-a*d+b*c)^5*g^4*ln((-a*
d+b*c)/b/(d*x+c))*(12*A+25*B+12*B*ln(e*(b*x+a)/(d*x+c)))/b/d^5+2/5*B^2*(-a*
d+b*c)^5*g^4*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^5
```

Rubi [A] time = 0.85, antiderivative size = 557, normalized size of antiderivative = 1.53, number of steps used = 28, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}-\frac{2Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5bd^5}-\frac{Bg^4(a+bx)^2(bc-ad}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (13*B^2*(b*c - a*d)^4*g^4*x)/(30*d^4)
 - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^
4*(a + b*x)^3)/(30*b*d^2) + (2*B^2*(b*c - a*d)^4*g^4*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)])/(5*b*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(5*b*d^3) + (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*b*d^2) - (B*(b*c - a*d)*g^4*(a + b*
x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b*d) + (g^4*(a + b*x)^5*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b) - (5*B^2*(b*c - a*d)^5*g^4*Log[c
+ d*x])/(6*b*d^5) + (2*B^2*(b*c - a*d)^5*g^4*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(5*b*d^5) - (2*B*(b*c - a*d)^5*g^4*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x])/(5*b*d^5) - (B^2*(b*c - a*d)^5*g^4*Log[c + d*x
]^2)/(5*b*d^5) + (2*B^2*(b*c - a*d)^5*g^4*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])/(5*b*d^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{(2B)\int \frac{(bc-ad)g^5(a+bx)^4\left(A+B\,\mathrm{lo}\right.}{c+dx}}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int \frac{(a+bx)^4\left(A\right.}{}}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int\left(-\frac{b(bc-a}{}\right.}{}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int (a+bx)^3}{5a}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} - \frac{B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{5bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{2B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{5bd^4} - \frac{B(}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{2B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{5bd^4} - \frac{B(}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{60bd^3}$$

Mathematica [**A**] time = 0.49, size = 511, normalized size = 1.40

$$\frac{g^4\left(\frac{B(bc-ad)\left(-6d^4(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+8d^3(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-12d^2(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-24(bc-ad)^4\,\mathrm{lo}\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(b*c - a*d)*(
24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a
*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*
Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2
*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2
*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d
*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c
 - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12*d^5)))/(5*b)
```

fricas **[F]** time = 1.85, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^{2} b^{4} g^{4} x^{4} + 4\, A^{2} a b^{3} g^{4} x^{3} + 6\, A^{2} a^{2} b^{2} g^{4} x^{2} + 4\, A^{2} a^{3} b g^{4} x + A^{2} a^{4} g^{4} + \left(B^{2} b^{4} g^{4} x^{4} + 4\, B^{2} a b^{3} g^{4} x^{3} + 6\, B^{2} a^{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((b*e*x + a*e)/(d
*x + c))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x
^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log((b*e*x + a*e)/(d*x + c)), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[F]** time = 2.57, size = 0, normalized size = 0.00

$$\int \left(b g x + a g\right)^{4} \left(B \ln\left(\frac{\left(b x + a\right) e}{d x + c}\right) + A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

maxima **[B]** time = 2.38, size = 2389, normalized size = 6.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b -
```

```
 c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)
) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*
a^3*b*g^4 + 2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x +
 a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 1/3*(6*x^4*log(b*e*x/(d*x + c) + a
*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c
*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^
3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/30*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*
x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3
 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*
b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 + A^2*a^4*g^4
*x - 1/30*((12*g^4*log(e) + 25*g^4)*b^4*c^5 - (60*g^4*log(e) + 113*g^4)*a*b
^3*c^4*d + 4*(30*g^4*log(e) + 49*g^4)*a^2*b^2*c^3*d^2 - 12*(10*g^4*log(e) +
 13*g^4)*a^3*b*c^2*d^3 + 12*(5*g^4*log(e) + 4*g^4)*a^4*c*d^4)*B^2*log(d*x +
 c)/d^5 - 2/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 1
0*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x + a)*log(
(b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*
d^5) + 1/60*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 - 6*(b^5*c*d^4*g^4*log(e) - (1
0*g^4*log(e)^2 + g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 2*((4*g^4*log(e) + g^4)*b
^5*c^2*d^3 - 2*(10*g^4*log(e) + g^4)*a*b^4*c*d^4 + (60*g^4*log(e)^2 + 16*g^
4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 - ((12*g^4*log(e) + 7*g^4)*b^5*c^3*d^2
 - 3*(20*g^4*log(e) + 9*g^4)*a*b^4*c^2*d^3 + 3*(40*g^4*log(e) + 11*g^4)*a^2
*b^3*c*d^4 - (120*g^4*log(e)^2 + 72*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^2*x
^2 + 2*((12*g^4*log(e) + 13*g^4)*b^5*c^4*d - (60*g^4*log(e) + 59*g^4)*a*b^4
*c^3*d^2 + 6*(20*g^4*log(e) + 17*g^4)*a^2*b^3*c^2*d^3 - (120*g^4*log(e) + 7
9*g^4)*a^3*b^2*c*d^4 + (30*g^4*log(e)^2 + 48*g^4*log(e) + 23*g^4)*a^4*b*d^5
)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^
3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x + B^2*a^
5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 10*
a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 + 2*(12*B^2*b^
5*d^5*g^4*x^5*log(e) - 3*(b^5*c*d^4*g^4 - (20*g^4*log(e) + g^4)*a*b^4*d^5)*
B^2*x^4 + 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + 2*(15*g^4*log(e) + 2*g^4
)*a^2*b^3*d^5)*B^2*x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*
b^3*c*d^4*g^4 - 2*(10*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^
4*d*g^4 - 5*a*b^4*c^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g
^4 + (5*g^4*log(e) + 4*g^4)*a^4*b*d^5)*B^2*x + (12*a*b^4*c^4*d*g^4 - 54*a^2
*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 + (12*g^4*lo
g(e) + 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) - 2*(12*B^2*b^5*d^5*g^4*x^5*log(e
) - 3*(b^5*c*d^4*g^4 - (20*g^4*log(e) + g^4)*a*b^4*d^5)*B^2*x^4 + 4*(b^5*c^
2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + 2*(15*g^4*log(e) + 2*g^4)*a^2*b^3*d^5)*B^2*
x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 - 2*(
10*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^4*d*g^4 - 5*a*b^4*c
^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g^4 + (5*g^4*log(e)
+ 4*g^4)*a^4*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g + b g x\right)^4 \left(A + B \ln\left(\frac{e\,(a + b x)}{c + d x}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^4*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.98 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=309

$$-\frac{Bg^3(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{12bd^4}-\frac{Bg^3(a+bx)(bc-ad)^3\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+5\right.}{12bd^3}$$

```
[Out] -1/6*B*(-a*d+b*c)*g^3*(b*x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d+1/4*g^3*(b*
x+a)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b+1/12*B*(-a*d+b*c)^2*g^3*(b*x+a)^2*(3
*A+B+3*B*ln(e*(b*x+a)/(d*x+c)))/b/d^2-1/12*B*(-a*d+b*c)^3*g^3*(b*x+a)*(6*A+
5*B+6*B*ln(e*(b*x+a)/(d*x+c)))/b/d^3-1/12*B*(-a*d+b*c)^4*g^3*ln((-a*d+b*c)/
b/(d*x+c))*(6*A+11*B+6*B*ln(e*(b*x+a)/(d*x+c)))/b/d^4-1/2*B^2*(-a*d+b*c)^4*
g^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^4
```

Rubi [A] time = 0.65, antiderivative size = 474, normalized size of antiderivative = 1.53, number of steps used = 24, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bd^4}+\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bd^4}+\frac{Bg^3(a+bx)^2(bc-ad)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (5*B^2*(b*c - a*d)^3*g^3*x)/(12*d^3) +
 (B^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/(12*b*d^2) - (B^2*(b*c - a*d)^3*g^3*(a
 + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(2*b*d^3) + (B*(b*c - a*d)^2*g^3*(a +
 b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b*d^2) - (B*(b*c - a*d)*g^
3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b*d) + (g^3*(a + b*x
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) + (11*B^2*(b*c - a*d)^4*g
^3*Log[c + d*x])/(12*b*d^4) - (B^2*(b*c - a*d)^4*g^3*Log[-((d*(a + b*x))/(b
*c - a*d))]*Log[c + d*x])/(2*b*d^4) + (B*(b*c - a*d)^4*g^3*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[c + d*x])/(2*b*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[c
 + d*x]^2)/(4*b*d^4) - (B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(2*b*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b} - \frac{B\int \frac{(bc-ad)g^4(a+bx)^3\left(A+B\log\left(\right.\right.}{c+dx}}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3\left(A+\right.}{}}{2b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2\left(\right.}{}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int(a+bx)^2}{2d}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} + \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bd^3} + \frac{B(b}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bd^3} + \frac{B(b}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{12bd^2}$$

Mathematica [A] time = 0.37, size = 391, normalized size = 1.27

$$g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B(bc-ad)\left(2d^3(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+3d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-6(bc-ad)^3\,\mathrm{lo}\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(
6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(
c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c
- a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(
b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[
c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
 + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4))
)/(4*b)
```

fricas **[F]** time = 1.89, size = 0, normalized size = 0.00

$$\text{integral}\left(A^{2} b^{3} g^{3} x^{3} + 3\, A^{2} a b^{2} g^{3} x^{2} + 3\, A^{2} a^{2} b g^{3} x + A^{2} a^{3} g^{3} + \left(B^{2} b^{3} g^{3} x^{3} + 3\, B^{2} a b^{2} g^{3} x^{2} + 3\, B^{2} a^{2} b g^{3} x + B^{2} a^{3} g^{3}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^
3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[F]** time = 2.18, size = 0, normalized size = 0.00

$$\int \left(b g x + a g\right)^{3} \left(B \ln\left(\frac{\left(b x + a\right) e}{d x + c}\right) + A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima **[B]** time = 2.37, size = 1732, normalized size = 5.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B
*a^3*g^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b
^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3 + (2*x^3*log
(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
```

```
+ c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A
*B*a*b^2*g^3 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*
g^3 + A^2*a^3*g^3*x + 1/12*((6*g^3*log(e) + 11*g^3)*b^3*c^4 - 2*(12*g^3*log
(e) + 19*g^3)*a*b^2*c^3*d + 9*(4*g^3*log(e) + 5*g^3)*a^2*b*c^2*d^2 - 6*(4*g
^3*log(e) + 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 1/2*(b^4*c^4*g^3 - 4*a
*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d^4*g^3)*(
log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
 - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 - 2*(b^4*c*d^3
*g^3*log(e) - (6*g^3*log(e)^2 + g^3*log(e))*a*b^3*d^4)*B^2*x^3 + ((3*g^3*lo
g(e) + g^3)*b^4*c^2*d^2 - 2*(6*g^3*log(e) + g^3)*a*b^3*c*d^3 + (18*g^3*log(
e)^2 + 9*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 - ((6*g^3*log(e) + 5*g^3)*b
^4*c^3*d - (24*g^3*log(e) + 17*g^3)*a*b^3*c^2*d^2 + (36*g^3*log(e) + 19*g^3
)*a^2*b^2*c*d^3 - (12*g^3*log(e)^2 + 18*g^3*log(e) + 7*g^3)*a^3*b*d^4)*B^2*
x + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a)^2 + 3*(B^2*b^
4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2
*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3
 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) -
 2*(b^4*c*d^3*g^3 - (12*g^3*log(e) + g^3)*a*b^3*d^4)*B^2*x^3 + 3*(b^4*c^2*d
^2*g^3 - 4*a*b^3*c*d^3*g^3 + 3*(4*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 -
6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 - (4*g^3*log(e
) + 3*g^3)*a^3*b*d^4)*B^2*x - (6*a*b^3*c^3*d*g^3 - 21*a^2*b^2*c^2*d^2*g^3 +
 26*a^3*b*c*d^3*g^3 - (6*g^3*log(e) + 11*g^3)*a^4*d^4)*B^2)*log(b*x + a) -
(6*B^2*b^4*d^4*g^3*x^4*log(e) - 2*(b^4*c*d^3*g^3 - (12*g^3*log(e) + g^3)*a*
b^3*d^4)*B^2*x^3 + 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 + 3*(4*g^3*log(e)
 + g^3)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a
^2*b^2*c*d^3*g^3 - (4*g^3*log(e) + 3*g^3)*a^3*b*d^4)*B^2*x + 6*(B^2*b^4*d^4
*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*
b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c))/(b*d^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g + b g x\right)^3 \left(A + B \ln\left(\frac{e\, (a + b x)}{c + d x}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.99 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 \, dx$

Optimal. Leaf size=253

$$\frac{Bg^2(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+3B\right)}{3bd^3}+\frac{Bg^2(a+bx)(bc-ad)^2\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+B\right)}{3bd^2}-$$

```
[Out] -1/3*B*(-a*d+b*c)*g^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d+1/3*g^2*(b*
x+a)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b+1/3*B*(-a*d+b*c)^2*g^2*(b*x+a)*(2*A+
B+2*B*ln(e*(b*x+a)/(d*x+c)))/b/d^2+1/3*B*(-a*d+b*c)^3*g^2*ln((-a*d+b*c)/b/(
d*x+c))*(2*A+3*B+2*B*ln(e*(b*x+a)/(d*x+c)))/b/d^3+2/3*B^2*(-a*d+b*c)^3*g^2*
polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^3
```

Rubi [A] time = 0.55, antiderivative size = 389, normalized size of antiderivative = 1.54, number of steps used = 20, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}-\frac{2Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bd^3}+\frac{2ABg^2x(bc-ad)^2}{3d^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) + (
2*B^2*(b*c - a*d)^2*g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*b*d^2) -
 (B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*
d) + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b) - (B^2*
(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*Log[-((d
*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (2*B*(b*c - a*d)^3*g^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*b*d^3) - (B^2*(b*c -
a*d)^3*g^2*Log[c + d*x]^2)/(3*b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx=\frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b}-\frac{(2B)\int\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\right.\right.}{c+dx}}{3bg}$$

$$=\frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b}-\frac{\left(2B(bc-ad)g^2\right)\int\frac{(a+bx)^2\left(A+B\right.}{c+}}{3b}$$

$$=\frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b}-\frac{\left(2B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)\left(\right.}{}\right.}{}$$

$$=\frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b}-\frac{\left(2B(bc-ad)g^2\right)\int(a+bx)\left(A\right.}{3d}$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}-\frac{B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3bd}+$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}+\frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bd^2}-\frac{B(bc}{}$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}+\frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bd^2}-\frac{B(bc}{}$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}+\frac{B^2(bc-ad)^2g^2x}{3d^2}+\frac{2B^2(bc-ad)^2g^2(a+bx)\,\mathrm{lo}}{3bd^2}$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}+\frac{B^2(bc-ad)^2g^2x}{3d^2}+\frac{2B^2(bc-ad)^2g^2(a+bx)\,\mathrm{lo}}{3bd^2}$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}+\frac{B^2(bc-ad)^2g^2x}{3d^2}+\frac{2B^2(bc-ad)^2g^2(a+bx)\,\mathrm{lo}}{3bd^2}$$

$$=\frac{2AB(bc-ad)^2g^2x}{3d^2}+\frac{B^2(bc-ad)^2g^2x}{3d^2}+\frac{2B^2(bc-ad)^2g^2(a+bx)\,\mathrm{lo}}{3bd^2}$$

Mathematica [A] time = 0.29, size = 287, normalized size = 1.13

$$g^2\left(\frac{B(bc-ad)\left(-d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2Abdx(bc-ad)+2Bd(a+bx)(bc-ad)\log\left(\frac{e(a+bx)}{c+dx}\right)+B(bc-ad)^2\left(\right.\right.}{d^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(b*c - a*d)*(
2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c +
```

```
d*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a
*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*L
og[c + d*x] + B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + B*(b*c
- a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(3*b)
```

fricas [F] time = 0.96, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABb^2g^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b
^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)), x
)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.90, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^2 \left(B\ln\left(\frac{(bx+a)\,e}{dx+c}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [B] time = 2.33, size = 1165, normalized size = 4.60

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x
 + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
- (b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(
d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 + A^2*a^2*g^2
*x - 1/3*((2*g^2*log(e) + 3*g^2)*b^2*c^3 - (6*g^2*log(e) + 7*g^2)*a*b*c^2*d
 + 2*(3*g^2*log(e) + 2*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*
g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x + a)*lo
g((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(
b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 - (b^3*c*d^2*g^2*log(e) - (3*g^2
```

```
*log(e)^2 + g^2*log(e))*a*b^2*d^3)*B^2*x^2 + ((2*g^2*log(e) + g^2)*b^3*c^2*
d - 2*(3*g^2*log(e) + g^2)*a*b^2*c*d^2 + (3*g^2*log(e)^2 + 4*g^2*log(e) + g
^2)*a^2*b*d^3)*B^2*x + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B
^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + (B^2*b^3*d^3*g^2*x^3
 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^3*c^3*g^2 - 3*a*b^2
*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 + (2*B^2*b^3*d^3*g^2*x^
3*log(e) - (b^3*c*d^2*g^2 - (6*g^2*log(e) + g^2)*a*b^2*d^3)*B^2*x^2 + 2*(b^
3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 + (3*g^2*log(e) + 2*g^2)*a^2*b*d^3)*B^2*x +
 (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 + (2*g^2*log(e) + 3*g^2)*a^3*d^3)*B
^2)*log(b*x + a) - (2*B^2*b^3*d^3*g^2*x^3*log(e) - (b^3*c*d^2*g^2 - (6*g^2*
log(e) + g^2)*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 + (
3*g^2*log(e) + 2*g^2)*a^2*b*d^3)*B^2*x + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b
^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a))*log
(d*x + c))/(b*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)^2\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.100 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=180

$$-\frac{Bg(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{bd^2}-\frac{Bg(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bd}+\frac{g(a+bx)^2\left(\right.}{}$$

```
[Out] -B*(-a*d+b*c)*g*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d+1/2*g*(b*x+a)^2*(A+
B*ln(e*(b*x+a)/(d*x+c)))^2/b-B*(-a*d+b*c)^2*g*ln((-a*d+b*c)/b/(d*x+c))*(A+B
+B*ln(e*(b*x+a)/(d*x+c)))/b/d^2-B^2*(-a*d+b*c)^2*g*polylog(2,d*(b*x+a)/b/(d
*x+c))/b/d^2
```

Rubi [A] time = 0.46, antiderivative size = 285, normalized size of antiderivative = 1.58, number of steps used = 16, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}+\frac{Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx}{c+dx}\right.\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*x)/d) - (B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)])/(b*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(2*b) + (B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) - (B^2*(b*c - a*d)^2*g*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^2) + (B*(b*c - a*d)^2*
g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*d^2) + (B^2*(b*c -
a*d)^2*g*Log[c + d*x]^2)/(2*b*d^2) - (B^2*(b*c - a*d)^2*g*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/(b*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{B\int \frac{(bc-ad)g^2(a+bx)\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{c+dx}}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int \frac{(a+bx)\left(A+B\log\right.}{c+dx}}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int\left(\frac{b\left(A+B\log\left(\frac{e(a}{c+}\right.\right.}{d}\right.}{}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int\left(A+B\log\left(\right.\right.}{d}$$

$$= -\frac{AB(bc-ad)gx}{d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} + \frac{B(bc-ad}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx}{}$$

Mathematica [A] time = 0.17, size = 203, normalized size = 1.13

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B(bc-ad)\left(-2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2Bd(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)+B(bc-ad)\left(2\mathrm{Li}_2\left(\frac{b(c+}{bc-}\right.\right.\right.}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(2*
A*b*d*x + 2*B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 2*B*(b*c - a*d)*Lo
g[c + d*x] - 2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x
] + B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^2))/(2*b)
```

fricas [F] time = 0.88, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{bex+ae}{dx+c}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(d*x
 + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.62, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)\left(B\ln\left(\frac{\left(bx+a\right)e}{dx+c}\right)+A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [B] time = 2.21, size = 611, normalized size = 3.39

$$\frac{1}{2}A^{2}bgx^{2}+2\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)ABag+\left(x^{2}\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a
)/b - c*log(d*x + c)/d)*A*B*a*g + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b
*g + A^2*a*g*x + ((g*log(e) + g)*b*c^2 - (2*g*log(e) + g)*a*c*d)*B^2*log(d*
x + c)/d^2 + (b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b*x + a)*log((b*d*x
 + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^2) +
 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 - 2*(b^2*c*d*g*log(e) - (g*log(e)^2 + g*lo
g(e))*a*b*d^2)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2
*g)*log(b*x + a)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x - (b^2*c^2*g -
2*a*b*c*d*g)*B^2)*log(d*x + c)^2 + 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(
e) + g)*a*b*d^2 - b^2*c*d*g)*B^2*x + ((g*log(e) + g)*a^2*d^2 - a*b*c*d*g)*B
^2)*log(b*x + a) - 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(e) + g)*a*b*d^2
- b^2*c*d*g)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g
)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.101 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=128

$$\frac{2B\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{bg}+\frac{2B^2\text{Li}_3\left(\frac{b(c+dx)}{d(a+bx)}\right)}{bg}$$

```
[Out] -(A+B*ln(e*(b*x+a)/(d*x+c)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b/g+2*B*(A+B*ln(e*
(b*x+a)/(d*x+c)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b/g+2*B^2*polylog(3,b*(d*x
+c)/d/(b*x+a))/b/g
```

Rubi [B] time = 3.42, antiderivative size = 728, normalized size of antiderivative = 5.69, number of steps used = 46, number of rules used = 23, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.719, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396}

$$\frac{2AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}-\frac{2B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(a+bx)}{c+dx}\right)+\log(a+bx)+\log\left(\frac{1}{c+dx}\right)\right)}{bg}-2B^2\text{PolyLog}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x),x]
```

```
[Out] -((A*B*Log[g*(a + b*x)]^2)/(b*g)) + (B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (B^2
*Log[a + b*x]^2*Log[-c - d*x])/(b*g) + (2*B^2*Log[a + b*x]*Log[g*(a + b*x)]
*Log[-c - d*x])/(b*g) - (B^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b*g) + (B^2
*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(b*g) - (B^2*Log[
g*(a + b*x)]*Log[(c + d*x)^(-1)]^2)/(b*g) + (B^2*Log[a + b*x]^2*Log[(b*(c +
 d*x))/(b*c - a*d)])/(b*g) + (B^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c
 - a*d)])/(b*g) + ((A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[a*g + b*g*x])
/(b*g) + (2*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b*g) - (2
*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Lo
g[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b*g) - (B^2*Log[(e*(a + b*x
))/(c + d*x)]*Log[a*g + b*g*x]^2)/(b*g) - (B^2*Log[(b*(c + d*x))/(b*c - a*d
)]*Log[a*g + b*g*x]^2)/(b*g) + (2*A*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/(b*g) + (2*B^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(b*g) - (2*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c +
 d*x)])*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*Log[(c + d
*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) - (2*B^2*PolyLog[3,
-((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*PolyLog[3, (b*(c + d*x))/(b*c
 - a*d)])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
```

```
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{e(a+bx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{a+bx}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int \left(\frac{d\left(-A-B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{(bc-ad)(c+dx)}\right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} - (2B$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \left(\frac{A\log(ag+bgx)}{a+bx}+\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)\log(ag+bg}{a+bx}\right.}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2AB)\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{\left(2B^2\right)\int \frac{\log\left(\frac{e(a+bx)}{c+dx}\right.}{}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} + \frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - B^2\log$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} + \frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - 2B^2\Big(\mathrm{l}$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{2B^2\log(a+bx)\log(g(a+bx))\log(-c-dx)}{bg} - B^2\log(g($$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{2B^2\log(a+bx)\log(g(a+bx))\log(-c-dx)}{bg} + B^2\log\Big(-$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2(a+bx)\log(-c-dx)}{bg} + 2B^2$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2(a+bx)\log(-c-dx)}{bg} + 2B^2$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2(a+bx)\log(-c-dx)}{bg} + 2B^2$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2(a+bx)\log(-c-dx)}{bg} + 2B^2$$

Mathematica [A] time = 0.61, size = 250, normalized size = 1.95

$$\frac{A^2\log(a+bx)+2AB\log(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)-2AB\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+2AB\log(a+bx)\log\left(\frac{c}{d}+x\right)-2AB\log(}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x),x]
```

```
[Out] (A*B*Log[a/b + x]^2 + A^2*Log[a + b*x] - 2*A*B*Log[a/b + x]*Log[a + b*x] +
2*A*B*Log[c/d + x]*Log[a + b*x] - 2*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(-(b
*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - B^2*Log[(-(
b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*A*B*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)] + 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2
, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x
))])/(b*g)
```

fricas [F] time = 1.64, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(b*g*x + a*g), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.06, size = 1186, normalized size = 9.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(b*g*x+a*g),x)
```

```
[Out] -d/g/(a*d-b*c)*A^2/b*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*a+1/g/(a*d-b*
c)*A^2*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*c+d/g/(a*d-b*c)*A^2/b*ln(b/
d*e+(a*d-b*c)/(d*x+c)/d*e)*a-1/g/(a*d-b*c)*A^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d
*e)*c-d/g/(a*d-b*c)*B^2/b*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*ln(1-1/b/e*d*(b
/d*e+(a*d-b*c)/(d*x+c)/d*e))*a+1/g/(a*d-b*c)*B^2*ln(b/d*e+(a*d-b*c)/(d*x+c)
/d*e)^2*ln(1-1/b/e*d*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*c-2*d/g/(a*d-b*c)*B^2/b
*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*polylog(2,1/b/e*d*(b/d*e+(a*d-b*c)/(d*x+c)
/d*e))*a+2/g/(a*d-b*c)*B^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*polylog(2,1/b/e*
d*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*c+2*d/g/(a*d-b*c)*B^2/b*polylog(3,1/b/e*d*
(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*a-2/g/(a*d-b*c)*B^2*polylog(3,1/b/e*d*(b/d*e
+(a*d-b*c)/(d*x+c)/d*e))*c+1/3*d/g/(a*d-b*c)*B^2/b*ln(b/d*e+(a*d-b*c)/(d*x+
c)/d*e)^3*a-1/3/g/(a*d-b*c)*B^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^3*c-2*d/g/(
a*d-b*c)*A*B/b*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*a+2/g/(a*
```

```
d-b*c)*A*B*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*c-2*d/g/(a*d-
b*c)*A*B/b*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+
c)/d*e)*d)/b/e)*a+2/g/(a*d-b*c)*A*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-(-b
*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*c+d/g/(a*d-b*c)*A*B*ln(b/d*e+(a*d-
b*c)/(d*x+c)/d*e)^2/b*a-1/g/(a*d-b*c)*A*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2
*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{B^2\log(bx+a)\log(dx+c)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2\,ABbc\log(e)+\left(B^2bdx+B^2bc\right)\log(bx+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - integr
ate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log(b*x +
 a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) - 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x + (2*B^2*b*d*x + (b*c + a*d)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(a*g + b*g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{A^2}{a+bx}\,dx+\int\frac{B^2\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)^2}{a+bx}\,dx+\int\frac{2AB\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}{a+bx}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] (Integral(A**2/(a + b*x), x) + Integral(B**2*log(a*e/(c + d*x) + b*e*x/(c +
 d*x))**2/(a + b*x), x) + Integral(2*A*B*log(a*e/(c + d*x) + b*e*x/(c + d*x
))/(a + b*x), x))/g
```

3.102 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=126

$$-\frac{2B(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}-\frac{2B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] -2*B^2*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)-2*B*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)
))/(-a*d+b*c)/g^2/(b*x+a)-(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)/
g^2/(b*x+a)
```

Rubi [C] time = 0.77, antiderivative size = 470, normalized size of antiderivative = 3.73, number of steps used = 26, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d\,\mathrm{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{2B^2d\,\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{2Bd\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg^2(bc-ad)}-\frac{2B\left(B\log\left(\frac{e(}{}\right.\right.}{bg^2(a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-2*B^2)/(b*g^2*(a + b*x)) - (2*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) - (2*B*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(b*g^2*(a + b*x)) - (2*B*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2
/(b*g^2*(a + b*x)) + (2*B^2*d*Log[c + d*x])/(b*(b*c - a*d)*g^2) - (2*B^2*d*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)*g^2) + (2*B*
d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*(b*c - a*d)*g^2) +
(B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (2*B^2*d*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) - (2*B^2*d*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (2*B^2*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int \Bigg(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\Big(A+B\log\Big(\frac{e(a+bx)}{c+dx}}{(bc-ad)^2(a+bx)}}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(2Bd)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{(bc-ad)g^2}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^2} - \frac{\Big(A+B\,\mathrm{lo}}{bg^2}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^2} - \frac{\Big(A+B\,\mathrm{lo}}{bg^2}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^2} - \frac{\Big(A+B\,\mathrm{lo}}{bg^2}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx}{b(}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx}{b(}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{2B\Big(A+B\log\Big(\frac{e(a+bx)}{c+dx}}{bg^2(a+bx)}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{2B\Big(A+B\log\Big(\frac{e(a+bx)}{c+dx}}{bg^2(a+bx)}$$

Mathematica [C] time = 0.45, size = 314, normalized size = 2.49

$$-\frac{\frac{B\Big(2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2d(a+bx)\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2d(a+bx)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-Bd(a+bx)\Big(\log(a+bx)\Big(\log(a+}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)*(A + B*Log[(e
*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
 d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x
]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a + b*x)*((2*L
```

```
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)]))))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

fricas [A] time = 1.10, size = 150, normalized size = 1.19

$$-\frac{\left(A^2+2\,AB+2\,B^2\right)bc-\left(A^2+2\,AB+2\,B^2\right)ad+\left(B^2bdx+B^2bc\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,(\left(AB+B^2\right)bdx+(AB+B^2}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="fricas
")
```

```
[Out] -((A^2 + 2*A*B + 2*B^2)*b*c - (A^2 + 2*A*B + 2*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((b*e*x + a*e)/(d*x + c))^2 + 2*((A*B + B^2)*b*d*x + (A*B + B^2)*b*
c)*log((b*e*x + a*e)/(d*x + c)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*
b*d)*g^2)
```

giac [A] time = 2.08, size = 176, normalized size = 1.40

$$-\frac{\left(B^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^2+2\,ABe^2\log\left(\frac{bxe+ae}{dx+c}\right)+2\,B^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)+A^2e^2+2\,ABe^2+2\,B^2e^2\right)(dx+c)(\frac{bc}{(bce-ade)(bc-ad}}{(bxe+ae)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] -(B^2*e^2*log((b*x*e + a*e)/(d*x + c))^2 + 2*A*B*e^2*log((b*x*e + a*e)/(d*x
 + c)) + 2*B^2*e^2*log((b*x*e + a*e)/(d*x + c)) + A^2*e^2 + 2*A*B*e^2 + 2*B
^2*e^2)*(d*x + c)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)
*(b*c - a*d)))/((b*x*e + a*e)*g^2)
```

maple [B] time = 0.05, size = 828, normalized size = 6.57

$$\frac{B^2ade\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)^2}{(ad-bc)^2\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)g^2}-\frac{B^2bce\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)^2}{(ad-bc)^2\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)g^2}+\frac{2ABade\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{(ad-bc)^2\left(\frac{ae}{dx+c}-\frac{bce}{(dx+c)d}+\frac{be}{d}\right)g^2}-\frac{2A}{(ad-b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(b*g*x+a*g)^2,x)
```

```
[Out] d*e/(a*d-b*c)^2/g^2*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-e/(a*d-b*
c)^2/g^2*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c+2*d*e/(a*d-b*c)^2/
g^2*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/
d*e)*a-2*e/(a*d-b*c)^2/g^2*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b
/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c+2*d*e/(a*d-b*c)^2/g^2*A*B/(1/(d*x+c)*a*e-1/
(d*x+c)*b*c/d*e+b/d*e)*a-2*e/(a*d-b*c)^2/g^2*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b
*c/d*e+b/d*e)*b*c+d*e/(a*d-b*c)^2/g^2*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+
b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a-e/(a*d-b*c)^2/g^2*B^2/(1/(d*x+c)
*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*b*c+2*d*e/(
a*d-b*c)^2/g^2*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*
c)/(d*x+c)/d*e)*a-2*e/(a*d-b*c)^2/g^2*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+
b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c+2*d*e/(a*d-b*c)^2/g^2*B^2/(1/(d*
x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-2*e/(a*d-b*c)^2/g^2*B^2/(1/(d*x+c)*a*e-
1/(d*x+c)*b*c/d*e+b/d*e)*b*c
```

maxima [B] time = 1.40, size = 416, normalized size = 3.30

$$-\left(2\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{\left(b^2c-abd\right)g^2}-\frac{d\log(dx+c)}{\left(b^2c-abd\right)g^2}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{(bdx+ad)\log(bx+a)^2+(bd}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="maxima
")
```

```
[Out] -(2*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log
(d*x + c)/((b^2*c - a*b*d)*g^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - ((b
*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d -
 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a)
)*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))*
B^2 - 2*A*B*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1
/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x +
 c)/((b^2*c - a*b*d)*g^2)) - B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^
2*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

mupad [B] time = 5.26, size = 222, normalized size = 1.76

$$-\frac{A^2+2\,A\,B+2\,B^2}{x\,b^2\,g^2+a\,b\,g^2}-\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^2\,\left(\frac{B^2}{b^2\,g^2\,\left(x+\frac{a}{b}\right)}-\frac{B^2\,d}{b\,g^2\,\left(a\,d-b\,c\right)}\right)-\frac{\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\left(\frac{2\,B^2}{b^2\,d\,g^2}+\frac{2\,A\,B}{b^2\,d\,g^2}\right)}{\frac{x}{d}+\frac{a}{b\,d}}-\frac{B\,d\,\mathrm{at}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(a*g + b*g*x)^2,x)
```

```
[Out] - (A^2 + 2*B^2 + 2*A*B)/(b^2*g^2*x + a*b*g^2) - log((e*(a + b*x))/(c + d*x)
)^2*(B^2/(b^2*g^2*(x + a/b)) - (B^2*d)/(b*g^2*(a*d - b*c))) - (log((e*(a +
b*x))/(c + d*x))*((2*B^2)/(b^2*d*g^2) + (2*A*B)/(b^2*d*g^2)))/(x/d + a/(b*d
)) - (B*d*atan(((2*b*d*x + (b^2*c*g^2 + a*b*d*g^2)/(b*g^2))*1i)/(a*d - b*c)
)*(A + B)*4i)/(b*g^2*(a*d - b*c))
```

sympy [B] time = 3.59, size = 434, normalized size = 3.44

$$-\frac{2Bd\,(A+B)\log\left(x+\frac{2ABad^2+2ABbcd+2B^2ad^2+2B^2bcd-\frac{2Ba^2d^3(A+B)}{ad-bc}+\frac{4Babcd^2(A+B)}{ad-bc}-\frac{2Bb^2c^2d(A+B)}{ad-bc}}{4ABbd^2+4B^2bd^2}\right)}{bg^2\,(ad-bc)}+\frac{2Bd\,(A+B)\log\left(x+\frac{2A}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] -2*B*d*(A + B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d + 2*B**2*a*d**2 + 2*B**2
*b*c*d - 2*B*a**2*d**3*(A + B)/(a*d - b*c) + 4*B*a*b*c*d**2*(A + B)/(a*d -
b*c) - 2*B*b**2*c**2*d*(A + B)/(a*d - b*c))/(4*A*B*b*d**2 + 4*B**2*b*d**2))
/(b*g**2*(a*d - b*c)) + 2*B*d*(A + B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d +
 2*B**2*a*d**2 + 2*B**2*b*c*d + 2*B*a**2*d**3*(A + B)/(a*d - b*c) - 4*B*a*b
*c*d**2*(A + B)/(a*d - b*c) + 2*B*b**2*c**2*d*(A + B)/(a*d - b*c))/(4*A*B*b
*d**2 + 4*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B - 2*B**2)*log(e*(a +
 b*x)/(c + d*x))/(a*b*g**2 + b**2*g**2*x) + (B**2*c + B**2*d*x)*log(e*(a +
b*x)/(c + d*x))**2/(a**2*d*g**2 - a*b*c*g**2 + a*b*d*g**2*x - b**2*c*g**2*x
) + (-A**2 - 2*A*B - 2*B**2)/(a*b*g**2 + b**2*g**2*x)
```

3.103 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=268

$$-\frac{bB(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)^2}+\frac{2Bd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3(a+bx)(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+}{}$$

```
[Out] 2*B^2*d*(d*x+c)/(-a*d+b*c)^2/g^3/(b*x+a)-1/4*b*B^2*(d*x+c)^2/(-a*d+b*c)^2/g
^3/(b*x+a)^2+2*B*d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^2/g^3/(b*
x+a)-1/2*b*B*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^2/g^3/(b*x+a)
^2+d*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^2/g^3/(b*x+a)-1/2*b*(
d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^2/g^3/(b*x+a)^2
```

Rubi [C] time = 0.91, antiderivative size = 577, normalized size of antiderivative = 2.15, number of steps used = 30, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)\Big(}{bg^3(b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -B^2/(4*b*g^3*(a + b*x)^2) + (3*B^2*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (3
*B^2*d^2*Log[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (B^2*d^2*Log[a + b*x]^2)/(
2*b*(b*c - a*d)^2*g^3) - (B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b*g^3*
(a + b*x)^2) + (B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*(b*c - a*d)*g^
3*(a + b*x)) + (B*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b
*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(2*b*g^3*(a +
b*x)^2) - (3*B^2*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3) + (B^2*d^2*Log[-
((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) - (B*d^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) - (
B^2*d^2*Log[c + d*x]^2)/(2*b*(b*c - a*d)^2*g^3) + (B^2*d^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)^2} + \right.}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{(bc-ad)^2g^3} - \left(B\right.$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\,\mathrm{lo}\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\,\mathrm{lo}\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\,\mathrm{lo}\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{2bg^3(a+bx}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{2bg^3(a+bx}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+bx}{2b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+bx}{2b(bc-ad)^2g^3}$$

Mathematica [C] time = 0.46, size = 443, normalized size = 1.65

$$-\frac{B\left(-4d^2(a+bx)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+4d^2(a+bx)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+4d(a+bx)(ad-bc)\left(B\log\left(\frac{e(}{}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -1/4*(2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)^2*(A + B
*Log[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e
*(a + b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(
a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) -
2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*
```

```
(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
 - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Lo
g[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(b*g^3*(a + b*x)^2)
```

fricas [**A**] time = 0.57, size = 367, normalized size = 1.37

$$-\frac{\left(2A^2+2AB+B^2\right)b^2c^2-4\left(A^2+2AB+2B^2\right)abcd+\left(2A^2+6AB+7B^2\right)a^2d^2-2\left(B^2b^2d^2x^2+2B^2abd^2x\right.}{4\left(\left(b^5c^2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*((2*A^2 + 2*A*B + B^2)*b^2*c^2 - 4*(A^2 + 2*A*B + 2*B^2)*a*b*c*d + (2*
A^2 + 6*A*B + 7*B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b
^2*c^2 + 2*B^2*a*b*c*d)*log((b*e*x + a*e)/(d*x + c))^2 - 2*((2*A*B + 3*B^2)
*b^2*c*d - (2*A*B + 3*B^2)*a*b*d^2)*x - 2*((2*A*B + 3*B^2)*b^2*d^2*x^2 - (2
*A*B + B^2)*b^2*c^2 + 4*(A*B + B^2)*a*b*c*d + 2*(B^2*b^2*c*d + 2*(A*B + B^2
)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b
^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*
b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [**A**] time = 1.75, size = 424, normalized size = 1.58

$$-\frac{\left(2B^2be^3\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{4(bxe+ae)B^2de^2\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+4ABbe^3\log\left(\frac{bxe+ae}{dx+c}\right)+2B^2be^3\log\left(\frac{bxe+ae}{dx+c}\right)-\frac{8(bxe+ae)ABde^2}{dx+c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] -1/4*(2*B^2*b*e^3*log((b*x*e + a*e)/(d*x + c))^2 - 4*(b*x*e + a*e)*B^2*d*e^
2*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 4*A*B*b*e^3*log((b*x*e + a*e)/
(d*x + c)) + 2*B^2*b*e^3*log((b*x*e + a*e)/(d*x + c)) - 8*(b*x*e + a*e)*A*B
*d*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 8*(b*x*e + a*e)*B^2*d*e^2*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*A^2*b*e^3 + 2*A*B*b*e^3 + B^2*b*e
^3 - 4*(b*x*e + a*e)*A^2*d*e^2/(d*x + c) - 8*(b*x*e + a*e)*A*B*d*e^2/(d*x +
 c) - 8*(b*x*e + a*e)*B^2*d*e^2/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d
)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e + a*e)^2*b*c*g^3/(d*x + c)^
2 - (b*x*e + a*e)^2*a*d*g^3/(d*x + c)^2)
```

maple [**B**] time = 0.05, size = 1715, normalized size = 6.40

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(b*g*x+a*g)^3,x)
```

```
[Out] d^2*e/(a*d-b*c)^3/g^3*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-d*e/(a*
d-b*c)^3/g^3*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c-1/2*d*e^2/(a*d
-b*c)^3/g^3*A^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+1/2*e^2/(a*d-
b*c)^3/g^3*A^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+2*d^2*e/(a*d
-b*c)^3/g^3*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/
(d*x+c)/d*e)*a-2*d*e/(a*d-b*c)^3/g^3*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b
```

```
/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c+2*d^2*e/(a*d-b*c)^3/g^3*A*B/(1/(d
*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-2*d*e/(a*d-b*c)^3/g^3*A*B/(1/(d*x+c)*a
*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c-d*e^2/(a*d-b*c)^3/g^3*A*B*b/(1/(d*x+c)*a*e-
1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+e^2/(a*d-b*c)^
3/g^3*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/
(d*x+c)/d*e)*c-1/2*d*e^2/(a*d-b*c)^3/g^3*A*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c
/d*e+b/d*e)^2*a+1/2*e^2/(a*d-b*c)^3/g^3*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*
c/d*e+b/d*e)^2*c+d^2*e/(a*d-b*c)^3/g^3*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e
+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a-d*e/(a*d-b*c)^3/g^3*B^2/(1/(d*x
+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*b*c+2*d^
2*e/(a*d-b*c)^3/g^3*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a
*d-b*c)/(d*x+c)/d*e)*a-2*d*e/(a*d-b*c)^3/g^3*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b
*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c+2*d^2*e/(a*d-b*c)^3/g^3*B
^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-2*d*e/(a*d-b*c)^3/g^3*B^2/(1/(
d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c-1/2*d*e^2/(a*d-b*c)^3/g^3*B^2*b/(1/
(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a+
1/2*e^2/(a*d-b*c)^3/g^3*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*l
n(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*c-1/2*d*e^2/(a*d-b*c)^3/g^3*B^2*b/(1/(d*x+
c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+1/2*e^2
/(a*d-b*c)^3/g^3*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e
+(a*d-b*c)/(d*x+c)/d*e)*c-1/4*d*e^2/(a*d-b*c)^3/g^3*B^2*b/(1/(d*x+c)*a*e-1/
(d*x+c)*b*c/d*e+b/d*e)^2*a+1/4*e^2/(a*d-b*c)^3/g^3*B^2*b^2/(1/(d*x+c)*a*e-1
/(d*x+c)*b*c/d*e+b/d*e)^2*c
```

maxima [**B**]   time = 1.81, size = 848, normalized size = 3.16

$$\frac{1}{4}\left(2\left(\frac{2\,bdx - bc + 3\,ad}{\left(b^4c - ab^3d\right)g^3x^2 + 2\left(ab^3c - a^2b^2d\right)g^3x + \left(a^2b^2c - a^3bd\right)g^3} + \frac{2\,d^2\log\left(bx + a\right)}{\left(b^3c^2 - 2\,ab^2cd + a^2bd^2\right)g^3} - \frac{2\,d^2\log(}{(b^3c^2 - 2\,ab^2c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="maxima
")
```

```
[Out] 1/4*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a
^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2
 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c
*d + a^2*b*d^2)*g^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (b^2*c^2 - 8*a
*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2
 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*
b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*
d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)
*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d
^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c
^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 + 1/2*A*B*((2*b*d*x -
 b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x +
(a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^
3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2
*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b
*d^2)*g^3)) - 1/2*B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^3*g^3*x^2 +
 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*
g^3)
```

mupad [**B**]   time = 5.85, size = 507, normalized size = 1.89

$$-\frac{\frac{2\,A^2\,a\,d-2\,A^2\,b\,c+7\,B^2\,a\,d-B^2\,b\,c+6\,A\,B\,a\,d-2\,A\,B\,b\,c}{2\,\left(a\,d-b\,c\right)}+\frac{x\,\left(3\,b\,d\,B^2+2\,A\,b\,d\,B\right)}{a\,d-b\,c}}{2\,a^2\,b\,g^3+4\,a\,b^2\,g^3\,x+2\,b^3\,g^3\,x^2}-\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)^2\,\left(\frac{B^2}{2\,b^2\,g^3\,\left(2\,a\,x+b\,x^2+\frac{a^2}{b}\right)}-\frac{}{2\,b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(a*g + b*g*x)^3,x)
```

```
[Out] - ((2*A^2*a*d - 2*A^2*b*c + 7*B^2*a*d - B^2*b*c + 6*A*B*a*d - 2*A*B*b*c)/(2
*(a*d - b*c)) + (x*(3*B^2*b*d + 2*A*B*b*d))/(a*d - b*c))/(2*a^2*b*g^3 + 2*b
^3*g^3*x^2 + 4*a*b^2*g^3*x) - log((e*(a + b*x))/(c + d*x))^2*(B^2/(2*b^2*g^
3*(2*a*x + b*x^2 + a^2/b)) - (B^2*d^2)/(2*b*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*
c*d))) - (log((e*(a + b*x))/(c + d*x))*((A*B)/(b^2*d*g^3) + (B^2*x*(a*d - b
*c))/(b*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B^2*d^2*((2*a^2*d^2 + b^2*c
^2 - 3*a*b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)))/(b*g^3*(a^2*d^2 + b
^2*c^2 - 2*a*b*c*d))))/((b*x^2)/d + a^2/(b*d) + (2*a*x)/d) - (B*d^2*atan((B
*d^2*(2*b*d*x - (b^3*c^2*g^3 - a^2*b*d^2*g^3)/(b*g^3*(a*d - b*c)))*(2*A + 3
*B)*1i)/((a*d - b*c)*(3*B^2*d^2 + 2*A*B*d^2)))*(2*A + 3*B)*1i)/(b*g^3*(a*d
- b*c)^2)
```

sympy [**B**] time = 6.55, size = 894, normalized size = 3.34

$$-\frac{Bd^{2}\left(2A+3B\right)\log\left(x+\frac{2ABad^{3}+2ABbcd^{2}+3B^{2}ad^{3}+3B^{2}bcd^{2}-\frac{Ba^{3}d^{5}(2A+3B)}{(ad-bc)^{2}}+\frac{3Ba^{2}bcd^{4}(2A+3B)}{(ad-bc)^{2}}-\frac{3Bab^{2}c^{2}d^{3}(2A+3B)}{(ad-bc)^{2}}+\frac{Bb^{3}c^{3}d^{2}(2A+3B)}{(ad-bc)^{2}}}{4ABbd^{3}+6B^{2}bd^{3}}\right)}{2bg^{3}\left(ad-bc\right)^{2}}+- B$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] -B*d**2*(2*A + 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 + 3*B**2*a*d**3
+ 3*B**2*b*c*d**2 - B*a**3*d**5*(2*A + 3*B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d
**4*(2*A + 3*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3*(2*A + 3*B)/(a*d - b*
c)**2 + B*b**3*c**3*d**2*(2*A + 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 + 6*B**2
*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + B*d**2*(2*A + 3*B)*log(x + (2*A*B*a*d
**3 + 2*A*B*b*c*d**2 + 3*B**2*a*d**3 + 3*B**2*b*c*d**2 + B*a**3*d**5*(2*A +
 3*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4*(2*A + 3*B)/(a*d - b*c)**2 + 3*B*a
*b**2*c**2*d**3*(2*A + 3*B)/(a*d - b*c)**2 - B*b**3*c**3*d**2*(2*A + 3*B)/(
a*d - b*c)**2)/(4*A*B*b*d**3 + 6*B**2*b*d**3))/(2*b*g**3*(a*d - b*c)**2) +
(2*B**2*a*c*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(a
+ b*x)/(c + d*x))**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*
g**3*x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*
g**3*x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**
3*x**2) + (-2*A*B*a*d + 2*A*B*b*c - 3*B**2*a*d + B**2*b*c - 2*B**2*b*d*x)*l
og(e*(a + b*x)/(c + d*x))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + 4*a**2*b*
*2*d*g**3*x - 4*a*b**3*c*g**3*x + 2*a*b**3*d*g**3*x**2 - 2*b**4*c*g**3*x**2
) + (-2*A**2*a*d + 2*A**2*b*c - 6*A*B*a*d + 2*A*B*b*c - 7*B**2*a*d + B**2*b
*c + x*(-4*A*B*b*d - 6*B**2*b*d))/(4*a**3*b*d*g**3 - 4*a**2*b**2*c*g**3 + x
**2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 - 8*a*b**3*c*
g**3))
```

3.104 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=418

$$-\frac{b^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^3}-\frac{2b^2B(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4(a+bx)(bc-ad)^3}-2B$$

```
[Out] -2*B^2*d^2*(d*x+c)/(-a*d+b*c)^3/g^4/(b*x+a)+1/2*b*B^2*d*(d*x+c)^2/(-a*d+b*c
)^3/g^4/(b*x+a)^2-2/27*b^2*B^2*(d*x+c)^3/(-a*d+b*c)^3/g^4/(b*x+a)^3-2*B*d^2
*(d*x+c)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^4/(b*x+a)+b*B*d*(d*x+c)
^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^4/(b*x+a)^2-2/9*b^2*B*(d*x+c)
^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*d+b*c)^3/g^4/(b*x+a)^3-d^2*(d*x+c)*(A+B*
ln(e*(b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g^4/(b*x+a)+b*d*(d*x+c)^2*(A+B*ln(e*(
b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g^4/(b*x+a)^2-1/3*b^2*(d*x+c)^3*(A+B*ln(e*(
b*x+a)/(d*x+c)))^2/(-a*d+b*c)^3/g^4/(b*x+a)^3
```

Rubi [C] time = 1.06, antiderivative size = 680, normalized size of antiderivative = 1.63, number of steps used = 34, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(c+}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B^2)/(27*b*g^4*(a + b*x)^3) + (5*B^2*d)/(18*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (11*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (11*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)^3
*g^4) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*b*g^4*(a + b*x)^3) +
(B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*(b*c - a*d)*g^4*(a + b*x)^2
) - (2*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*(b*c - a*d)^2*g^4*(
a + b*x)) - (2*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*
b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(3*b*g^4*(a +
 b*x)^3) + (11*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*L
og[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (2
*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*b*(b*c - a*d)^
3*g^4) + (B^2*d^3*Log[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d
^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b*(b*c - a*d)^3*g^4) - (2*B
^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B)\int\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^4}-\frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)^3}+\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{3g^4}-\frac{\left(2Bd^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{3(bc-ad)^3g^4}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9bg^4(a+bx)^3}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{3b(bc-ad)^2g^4(a+bx)}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9bg^4(a+bx)^3}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{3b(bc-ad)^2g^4(a+bx)}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9bg^4(a+bx)^3}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{3b(bc-ad)^2g^4(a+bx)}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d^3\,\mathrm{lo}}{9b(bc-}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d^3\,\mathrm{lo}}{9b(bc-}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d^3\,\mathrm{lo}}{9b(bc-}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d^3\,\mathrm{lo}}{9b(bc-}$$

Mathematica [C] time = 0.69, size = 585, normalized size = 1.40

$$-\frac{B\left(36d^3(a+bx)^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-36d^3(a+bx)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+36d^2(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+12(bc-ad)^3\left(B\,\mathrm{l}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -1/54*(18*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(12*(b*c - a*d)^3*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(
```

```
a + b*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a +
b*x))/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])
*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x]
- d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c)
+ a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c
 + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c
- a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log
[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B
*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[
c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^3)/(b*g^4
*(a + b*x)^3)
```

fricas [**A**] time = 0.69, size = 672, normalized size = 1.61

$$-\frac{2\left(9\,A^2+6\,AB+2\,B^2\right)b^3c^3-27\left(2\,A^2+2\,AB+B^2\right)ab^2c^2d+54\left(A^2+2\,AB+2\,B^2\right)a^2bcd^2-\left(18\,A^2+66\,A\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="fricas
")
```

```
[Out] -1/54*(2*(9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - 27*(2*A^2 + 2*A*B + B^2)*a*b^2*c
^2*d + 54*(A^2 + 2*A*B + 2*B^2)*a^2*b*c*d^2 - (18*A^2 + 66*A*B + 85*B^2)*a^
3*d^3 + 6*((6*A*B + 11*B^2)*b^3*c*d^2 - (6*A*B + 11*B^2)*a*b^2*d^3)*x^2 + 1
8*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3
- 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((b*e*x + a*e)/(d*x + c))^2 - 3
*((6*A*B + 5*B^2)*b^3*c^2*d - 18*(2*A*B + 3*B^2)*a*b^2*c*d^2 + (30*A*B + 49
*B^2)*a^2*b*d^3)*x + 6*((6*A*B + 11*B^2)*b^3*d^3*x^3 + 2*(3*A*B + B^2)*b^3*
c^3 - 9*(2*A*B + B^2)*a*b^2*c^2*d + 18*(A*B + B^2)*a^2*b*c*d^2 + 3*(2*B^2*b
^3*c*d^2 + 3*(2*A*B + 3*B^2)*a*b^2*d^3)*x^2 - 3*(B^2*b^3*c^2*d - 6*B^2*a*b^
2*c*d^2 - 6*(A*B + B^2)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c
^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3
- 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3
 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 -
3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [**A**] time = 1.89, size = 709, normalized size = 1.70

$$-\frac{\left(18\,B^2b^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{54\,(bxe+ae)B^2bde^3\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+\frac{54\,(bxe+ae)^2B^2d^2e^2\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}+36\,ABb^2e^4\log\left(\frac{bxe+ae}{dx+c}\right)+1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] -1/54*(18*B^2*b^2*e^4*log((b*x*e + a*e)/(d*x + c))^2 - 54*(b*x*e + a*e)*B^2
*b*d*e^3*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 54*(b*x*e + a*e)^2*B^2*
d^2*e^2*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 + 36*A*B*b^2*e^4*log((b*
x*e + a*e)/(d*x + c)) + 12*B^2*b^2*e^4*log((b*x*e + a*e)/(d*x + c)) - 108*(
b*x*e + a*e)*A*B*b*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 54*(b*x*e
 + a*e)*B^2*b*d*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 108*(b*x*e + a
*e)^2*A*B*d^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 108*(b*x*e + a
*e)^2*B^2*d^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 18*A^2*b^2*e^4
 + 12*A*B*b^2*e^4 + 4*B^2*b^2*e^4 - 54*(b*x*e + a*e)*A^2*b*d*e^3/(d*x + c)
- 54*(b*x*e + a*e)*A*B*b*d*e^3/(d*x + c) - 27*(b*x*e + a*e)*B^2*b*d*e^3/(d*
```

```
x + c) + 54*(b*x*e + a*e)^2*A^2*d^2*e^2/(d*x + c)^2 + 108*(b*x*e + a*e)^2*A
*B*d^2*e^2/(d*x + c)^2 + 108*(b*x*e + a*e)^2*B^2*d^2*e^2/(d*x + c)^2)*(b*c/
((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/((b*x*e
+ a*e)^3*b^2*c^2*g^4/(d*x + c)^3 - 2*(b*x*e + a*e)^3*a*b*c*d*g^4/(d*x + c)^
3 + (b*x*e + a*e)^3*a^2*d^2*g^4/(d*x + c)^3)
```

maple [B] time = 0.05, size = 2624, normalized size = 6.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3*e^3/(a*d-b*c)^4/g^4*A^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*
c-2/27*e^3/(a*d-b*c)^4/g^4*B^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^
3*c+2*d^3*e/(a*d-b*c)^4/g^4*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a+d
^3*e/(a*d-b*c)^4/g^4*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a+d*e^2/(a
*d-b*c)^4/g^4*A^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+1/3*d*e^3
/(a*d-b*c)^4/g^4*A^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-1/2*d^
2*e^2/(a*d-b*c)^4/g^4*B^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a+2*d
^3*e/(a*d-b*c)^4/g^4*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(
a*d-b*c)/(d*x+c)/d*e)*a-1/3*e^3/(a*d-b*c)^4/g^4*B^2*b^3/(1/(d*x+c)*a*e-1/(d
*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*c+1/2*d*e^2/(a*d-b
*c)^4/g^4*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+2/27*d*e^3/(a
*d-b*c)^4/g^4*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a+d^3*e/(a*
d-b*c)^4/g^4*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)
/(d*x+c)/d*e)^2*a-d^2*e/(a*d-b*c)^4/g^4*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*
e+b/d*e)*b*c+2*d^3*e/(a*d-b*c)^4/g^4*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b
/d*e)*a-2*d^2*e/(a*d-b*c)^4/g^4*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)
*b*c-d^2*e^2/(a*d-b*c)^4/g^4*A*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^
2*a-2*d^2*e/(a*d-b*c)^4/g^4*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(
b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c-d^2*e^2/(a*d-b*c)^4/g^4*B^2*b/(1/(d*x+c)*a
*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+d*e^2/(a*d-
b*c)^4/g^4*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-
b*c)/(d*x+c)/d*e)*c-2/9*e^3/(a*d-b*c)^4/g^4*B^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c
)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-d^2*e^2/(a*d-b*c)^4/g^
4*A^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a-2/9*e^3/(a*d-b*c)^4/g^4
*A*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*c-2*d^2*e^2/(a*d-b*c)^4/
g^4*A*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x
+c)/d*e)*a-2*d^2*e/(a*d-b*c)^4/g^4*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d
*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c+2/3*d*e^3/(a*d-b*c)^4/g^4*A*B*b^2/(
1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+
2*d*e^2/(a*d-b*c)^4/g^4*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*l
n(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-d^2*e/(a*d-b*c)^4/g^4*B^2/(1/(d*x+c)*a*e-1
/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*b*c-2/3*e^3/(a*d-
b*c)^4/g^4*A*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-
b*c)/(d*x+c)/d*e)*c+1/3*d*e^3/(a*d-b*c)^4/g^4*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x
+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a+2/9*d*e^3/(a*d-b*c
)^4/g^4*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c
)/(d*x+c)/d*e)*a-d^2*e^2/(a*d-b*c)^4/g^4*B^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c
/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a+d*e^2/(a*d-b*c)^4/g^4*A*B
*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+2/9*d*e^3/(a*d-b*c)^4/g^4*
A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-2*d^2*e/(a*d-b*c)^4/g^4
*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c+2*d^3*e/(a*d-b*c)^4/g^4*A*
B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a
+d*e^2/(a*d-b*c)^4/g^4*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln
(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*c
```

maxima [B] time = 2.45, size = 1419, normalized size = 3.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="maxima
")
```

```
[Out] -1/54*(6*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
- 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c
^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d
+ a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d
^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^
4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b
*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^
2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b
^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 -
 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*
b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 3
3*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^
3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g
^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g
^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*
b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*
x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*
b^2*d^3*g^4)*x))*B^2 - 1/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11
*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2
)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^
4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
 a^5*b*d^2)*g^4) + 6*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*
a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3
 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/(
(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*log
(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*
b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2
*g^4*x + a^3*b*g^4)
```

mupad [B] time = 7.41, size = 1064, normalized size = 2.55

$$\frac{\frac{18 A^2 a^2 d^2-36 A^2 a b c d+18 A^2 b^2 c^2+66 A B a^2 d^2-42 A B a b c d+12 A B b^2 c^2+85 B^2 a^2 d^2-23 B^2 a b c d+4 B^2 b^2 c^2}{6 (a d-b c)}+\frac{x \left(-5 c B^2 b^2 d+49 a B^2 b d^2\right.}{2 (a d}}{x \left(27 a^2 b^3 c g^4-27 a^3 b^2 d g^4\right)-x^2 \left(27 a^2 b^3 d g^4-27 a b^4 c g^4\right)+x^3 \left(9 b^5 c g^4-9 a b^4 d g^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(a*g + b*g*x)^4,x)
```

```
[Out] ((18*A^2*a^2*d^2 + 18*A^2*b^2*c^2 + 85*B^2*a^2*d^2 + 4*B^2*b^2*c^2 + 66*A*B
*a^2*d^2 + 12*A*B*b^2*c^2 - 36*A^2*a*b*c*d - 23*B^2*a*b*c*d - 42*A*B*a*b*c*
d)/(6*(a*d - b*c)) + (x*(49*B^2*a*b*d^2 - 5*B^2*b^2*c*d + 30*A*B*a*b*d^2 -
6*A*B*b^2*c*d))/(2*(a*d - b*c)) + (d*x^2*(11*B^2*b^2*d + 6*A*B*b^2*d))/(a*d
 - b*c))/(x*(27*a^2*b^3*c*g^4 - 27*a^3*b^2*d*g^4) - x^2*(27*a^2*b^3*d*g^4 -
 27*a*b^4*c*g^4) + x^3*(9*b^5*c*g^4 - 9*a*b^4*d*g^4) + 9*a^3*b^2*c*g^4 - 9*
a^4*b*d*g^4) - log((e*(a + b*x))/(c + d*x))^2*(B^2/(3*b^2*g^4*(3*a^2*x + a^
3/b + b^2*x^3 + 3*a*b*x^2)) - (B^2*d^3)/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b
^2*c^2*d - 3*a^2*b*c*d^2))) - (log((e*(a + b*x))/(c + d*x))*((2*A*B)/(3*b^2
*d*g^4) + (2*B^2*d^3*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(
a*d - b*c))/(3*b*d^2)) + (3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d
^2)/(3*b*d^4)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2
)) - (2*B^2*d^3*x^2*((b^2*c - a*b*d)/(3*d^2) - (2*b*(a*d - b*c))/(3*d^2)))/
(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (2*B^2*d^3*
```

```
x*(b*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^
2)) + (3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*d^3) + (2*a*(a*d - b*c))/(3*d^2)
))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))))/((3*a^2*
x)/d + a^3/(b*d) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (B*d^3*atan((B*d^3*((b^4*
c^3*g^4 + a^3*b*d^3*g^4 - a*b^3*c^2*d*g^4 - a^2*b^2*c*d^2*g^4)/(b^3*c^2*g^4
 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4) + 2*b*d*x)*(6*A + 11*B)*(b^3*c^2*g^4 +
a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4)*1i)/(b*g^4*(a*d - b*c)^3*(11*B^2*d^3 + 6*A
*B*d^3)))*(6*A + 11*B)*2i)/(9*b*g^4*(a*d - b*c)^3)
```

sympy [**B**] time = 34.30, size = 1544, normalized size = 3.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*(6*A + 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B*b*c*d**3 + 11*B**2*a*d**
4 + 11*B**2*b*c*d**3 - B*a**4*d**7*(6*A + 11*B)/(a*d - b*c)**3 + 4*B*a**3*b
*c*d**6*(6*A + 11*B)/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5*(6*A + 11*B)/
(a*d - b*c)**3 + 4*B*a*b**3*c**3*d**4*(6*A + 11*B)/(a*d - b*c)**3 - B*b**4*
c**4*d**3*(6*A + 11*B)/(a*d - b*c)**3)/(12*A*B*b*d**4 + 22*B**2*b*d**4))/(9
*b*g**4*(a*d - b*c)**3) + B*d**3*(6*A + 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B
*b*c*d**3 + 11*B**2*a*d**4 + 11*B**2*b*c*d**3 + B*a**4*d**7*(6*A + 11*B)/(a
*d - b*c)**3 - 4*B*a**3*b*c*d**6*(6*A + 11*B)/(a*d - b*c)**3 + 6*B*a**2*b**
2*c**2*d**5*(6*A + 11*B)/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4*(6*A + 11*B)
/(a*d - b*c)**3 + B*b**4*c**4*d**3*(6*A + 11*B)/(a*d - b*c)**3)/(12*A*B*b*d
**4 + 22*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3*B**2*a**2*c*d**2 + 3*
B**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**3*x**2 + B**2*b**2*c**
3 + B**2*b**2*d**3*x**3)*log(e*(a + b*x)/(c + d*x))**2/(3*a**6*d**3*g**4 -
9*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9*a**4*b**2*c**2*d*g**4 - 27*
a**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4*x**2 - 3*a**3*b**3*c**3*g**
4 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c*d**2*g**4*x**2 + 3*a**3*b**
3*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27*a**2*b**4*c**2*d*g**4*x**2
- 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*g**4*x**2 + 9*a*b**5*c**2*d*
g**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a**2*d**2 + 12*A*B*a*b*c*d - 6
*A*B*b**2*c**2 - 11*B**2*a**2*d**2 + 7*B**2*a*b*c*d - 15*B**2*a*b*d**2*x -
2*B**2*b**2*c**2 + 3*B**2*b**2*c*d*x - 6*B**2*b**2*d**2*x**2)*log(e*(a + b*
x)/(c + d*x))/(9*a**5*b*d**2*g**4 - 18*a**4*b**2*c*d*g**4 + 27*a**4*b**2*d*
*2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*a**3*b**3*c*d*g**4*x + 27*a**3*b**3*
d**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4*x - 54*a**2*b**4*c*d*g**4*x**2 + 9*
a**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c**2*g**4*x**2 - 18*a*b**5*c*d*g**4*x*
*3 + 9*b**6*c**2*g**4*x**3) - (18*A**2*a**2*d**2 - 36*A**2*a*b*c*d + 18*A**
2*b**2*c**2 + 66*A*B*a**2*d**2 - 42*A*B*a*b*c*d + 12*A*B*b**2*c**2 + 85*B**
2*a**2*d**2 - 23*B**2*a*b*c*d + 4*B**2*b**2*c**2 + x**2*(36*A*B*b**2*d**2 +
 66*B**2*b**2*d**2) + x*(90*A*B*a*b*d**2 - 18*A*B*b**2*c*d + 147*B**2*a*b*d
**2 - 15*B**2*b**2*c*d))/(54*a**5*b*d**2*g**4 - 108*a**4*b**2*c*d*g**4 + 54
*a**3*b**3*c**2*g**4 + x**3*(54*a**2*b**4*d**2*g**4 - 108*a*b**5*c*d*g**4 +
 54*b**6*c**2*g**4) + x**2*(162*a**3*b**3*d**2*g**4 - 324*a**2*b**4*c*d*g**
4 + 162*a*b**5*c**2*g**4) + x*(162*a**4*b**2*d**2*g**4 - 324*a**3*b**3*c*d*
g**4 + 162*a**2*b**4*c**2*g**4))
```

3.105 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=575

$$-\frac{b^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^4}-\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^5(a+bx)^3(bc-ad)^4}+$$

```
[Out] 2*B^2*d^3*(d*x+c)/(-a*d+b*c)^4/g^5/(b*x+a)-3/4*b*B^2*d^2*(d*x+c)^2/(-a*d+b*
c)^4/g^5/(b*x+a)^2+2/9*b^2*B^2*d*(d*x+c)^3/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/32*
b^3*B^2*(d*x+c)^4/(-a*d+b*c)^4/g^5/(b*x+a)^4+2*B*d^3*(d*x+c)*(A+B*ln(e*(b*x
+a)/(d*x+c)))/(-a*d+b*c)^4/g^5/(b*x+a)-3/2*b*B*d^2*(d*x+c)^2*(A+B*ln(e*(b*x
+a)/(d*x+c)))/(-a*d+b*c)^4/g^5/(b*x+a)^2+2/3*b^2*B*d*(d*x+c)^3*(A+B*ln(e*(b
*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/8*b^3*B*(d*x+c)^4*(A+B*ln(e*(b
*x+a)/(d*x+c)))/(-a*d+b*c)^4/g^5/(b*x+a)^4+d^3*(d*x+c)*(A+B*ln(e*(b*x+a)/(d
*x+c)))^2/(-a*d+b*c)^4/g^5/(b*x+a)-3/2*b*d^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d
*x+c)))^2/(-a*d+b*c)^4/g^5/(b*x+a)^2+b^2*d*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/4*b^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/(-a*d+b*c)^4/g^5/(b*x+a)^4
```

Rubi [C] time = 1.23, antiderivative size = 763, normalized size of antiderivative = 1.33, number of steps used = 38, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}+\frac{B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx}{2bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(32*b*g^5*(a + b*x)^4) + (7*B^2*d)/(72*b*(b*c - a*d)*g^5*(a + b*x)^3)
- (13*B^2*d^2)/(48*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(24*b*(b
*c - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(24*b*(b*c - a*d)^4*
g^5) - (B^2*d^4*Log[a + b*x]^2)/(4*b*(b*c - a*d)^4*g^5) - (B*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(8*b*g^5*(a + b*x)^4) + (B*d*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(2*b*(b*c - a*d)^3*g^5*(a + b*x)) + (B*d^4*Lo
g[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b*(b*c - a*d)^4*g^5) -
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(4*b*g^5*(a + b*x)^4) - (25*B^2*d^4*
Log[c + d*x])/(24*b*(b*c - a*d)^4*g^5) + (B^2*d^4*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B*d^4*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B^2*d^4*Log[c +
d*x]^2)/(4*b*(b*c - a*d)^4*g^5) + (B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5(c+dx)}\,dx}{2bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^5}-\frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)^4}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}\,dx}{2g^5}+\frac{\left(Bd^4\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{2(bc-ad)^4g^5}-$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8bg^5(a+bx)^4}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4b(bc-ad)^2g^5(a+bx}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8bg^5(a+bx)^4}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4b(bc-ad)^2g^5(a+bx}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8bg^5(a+bx)^4}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{4b(bc-ad)^2g^5(a+bx}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24}$$

Mathematica [C] time = 0.97, size = 748, normalized size = 1.30

$$-\frac{\frac{B\left(-144d^4(a+bx)^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+144d^4(a+bx)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+144d^3(a+bx)^3(ad-bc)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+72d^2(\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -1/288*(72*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(36*(b*c - a*d)^4*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B
*Log[(e*(a + b*x))/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e
*(a + b*x))/(c + d*x)]) + 144*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a
 + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 +
 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a +
 b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^
2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x
] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) +
a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*
(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c +
d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*
(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d
*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^4)/(b*g^5*(a +
 b*x)^4)
```

fricas [**A**] time = 1.50, size = 1035, normalized size = 1.80

$$-\frac{9(8A^2+4AB+B^2)b^4c^4-32(9A^2+6AB+2B^2)ab^3c^3d+216(2A^2+2AB+B^2)a^2b^2c^2d^2-288(A^2+2A}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algorithm="fricas
")
```

```
[Out] -1/288*(9*(8*A^2 + 4*A*B + B^2)*b^4*c^4 - 32*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*
c^3*d + 216*(2*A^2 + 2*A*B + B^2)*a^2*b^2*c^2*d^2 - 288*(A^2 + 2*A*B + 2*B^
2)*a^3*b*c*d^3 + (72*A^2 + 300*A*B + 415*B^2)*a^4*d^4 - 12*((12*A*B + 25*B^
2)*b^4*c*d^3 - (12*A*B + 25*B^2)*a*b^3*d^4)*x^3 + 6*((12*A*B + 13*B^2)*b^4*
c^2*d^2 - 16*(6*A*B + 11*B^2)*a*b^3*c*d^3 + (84*A*B + 163*B^2)*a^2*b^2*d^4)
*x^2 - 72*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 +
4*B^2*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2
 + 4*B^2*a^3*b*c*d^3)*log((b*e*x + a*e)/(d*x + c))^2 - 4*((12*A*B + 7*B^2)*
b^4*c^3*d - 12*(6*A*B + 5*B^2)*a*b^3*c^2*d^2 + 108*(2*A*B + 3*B^2)*a^2*b^2*
c*d^3 - (156*A*B + 271*B^2)*a^3*b*d^4)*x - 12*((12*A*B + 25*B^2)*b^4*d^4*x^
4 - 3*(4*A*B + B^2)*b^4*c^4 + 16*(3*A*B + B^2)*a*b^3*c^3*d - 36*(2*A*B + B^
2)*a^2*b^2*c^2*d^2 + 48*(A*B + B^2)*a^3*b*c*d^3 + 4*(3*B^2*b^4*c*d^3 + 2*(6
*A*B + 11*B^2)*a*b^3*d^4)*x^3 - 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 6*
(2*A*B + 3*B^2)*a^2*b^2*d^4)*x^2 + 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 +
 18*B^2*a^2*b^2*c*d^3 + 12*(A*B + B^2)*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x
 + c)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a
^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 -
4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d +
 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^
4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^
5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3
+ a^8*b*d^4)*g^5)
```

giac [**A**] time = 2.23, size = 995, normalized size = 1.73

$$-\frac{\left(72\,B^2b^3e^5\log\left(\frac{bxe+ae}{dx+c}\right)^2-\frac{288\,(bxe+ae)B^2b^2de^4\log\left(\frac{bxe+ae}{dx+c}\right)^2}{dx+c}+\frac{432\,(bxe+ae)^2B^2bd^2e^3\log\left(\frac{bxe+ae}{dx+c}\right)^2}{(dx+c)^2}-\frac{288\,(bxe+ae)^3B^2d^3e^2\log\Big(}{(dx+c)^3}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] -1/288*(72*B^2*b^3*e^5*log((b*x*e + a*e)/(d*x + c))^2 - 288*(b*x*e + a*e)*B
^2*b^2*d*e^4*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c) + 432*(b*x*e + a*e)^2
*B^2*b*d^2*e^3*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^2 - 288*(b*x*e + a*
e)^3*B^2*d^3*e^2*log((b*x*e + a*e)/(d*x + c))^2/(d*x + c)^3 + 144*A*B*b^3*e
^5*log((b*x*e + a*e)/(d*x + c)) + 36*B^2*b^3*e^5*log((b*x*e + a*e)/(d*x + c
)) - 576*(b*x*e + a*e)*A*B*b^2*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
 - 192*(b*x*e + a*e)*B^2*b^2*d*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) +
 864*(b*x*e + a*e)^2*A*B*b*d^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2
 + 432*(b*x*e + a*e)^2*B^2*b*d^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
^2 - 576*(b*x*e + a*e)^3*A*B*d^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
^3 - 576*(b*x*e + a*e)^3*B^2*d^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
^3 + 72*A^2*b^3*e^5 + 36*A*B*b^3*e^5 + 9*B^2*b^3*e^5 - 288*(b*x*e + a*e)*A^
2*b^2*d*e^4/(d*x + c) - 192*(b*x*e + a*e)*A*B*b^2*d*e^4/(d*x + c) - 64*(b*x
*e + a*e)*B^2*b^2*d*e^4/(d*x + c) + 432*(b*x*e + a*e)^2*A^2*b*d^2*e^3/(d*x
+ c)^2 + 432*(b*x*e + a*e)^2*A*B*b*d^2*e^3/(d*x + c)^2 + 216*(b*x*e + a*e)^
2*B^2*b*d^2*e^3/(d*x + c)^2 - 288*(b*x*e + a*e)^3*A^2*d^3*e^2/(d*x + c)^3 -
 576*(b*x*e + a*e)^3*A*B*d^3*e^2/(d*x + c)^3 - 576*(b*x*e + a*e)^3*B^2*d^3*
e^2/(d*x + c)^3)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*
(b*c - a*d)))/((b*x*e + a*e)^4*b^3*c^3*g^5/(d*x + c)^4 - 3*(b*x*e + a*e)^4*
a*b^2*c^2*d*g^5/(d*x + c)^4 + 3*(b*x*e + a*e)^4*a^2*b*c*d^2*g^5/(d*x + c)^4
 - (b*x*e + a*e)^4*a^3*d^3*g^5/(d*x + c)^4)
```

maple [**B**] time = 0.05, size = 3538, normalized size = 6.15

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(b*g*x+a*g)^5,x)
```

```
[Out] -3/2*d^3*e^2/(a*d-b*c)^5/g^5*A^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^
2*a+3/2*d^2*e^2/(a*d-b*c)^5/g^5*A^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/
d*e)^2*c-2*d^3*e/(a*d-b*c)^5/g^5*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e
)*b*c-d^3*e/(a*d-b*c)^5/g^5*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c
+2*d^4*e/(a*d-b*c)^5/g^5*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a+2*d^
4*e/(a*d-b*c)^5/g^5*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a
*d-b*c)/(d*x+c)/d*e)*a+d^4*e/(a*d-b*c)^5/g^5*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b
*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a+1/4*e^4/(a*d-b*c)^5/g^5*B
^2*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c)
/d*e)^2*c+1/8*e^4/(a*d-b*c)^5/g^5*B^2*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+
b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c+d^2*e^3/(a*d-b*c)^5/g^5*A^2*b^2/
(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-d*e^3/(a*d-b*c)^5/g^5*A^2*b^3/(
1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*c+3/4*d^2*e^2/(a*d-b*c)^5/g^5*B^2*
b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*c+2/9*d^2*e^3/(a*d-b*c)^5/g^5
*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*a-3/4*d^3*e^2/(a*d-b*c)^
5/g^5*B^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*a-1/4*d*e^4/(a*d-b*c)
^5/g^5*A^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*a-2/9*d*e^3/(a*d-b
*c)^5/g^5*B^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*c-1/32*d*e^4/(a
```

```
*d-b*c)^5/g^5*B^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*a+1/8*e^4/(
a*d-b*c)^5/g^5*A*B*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*c+1/4*e^4/
(a*d-b*c)^5/g^5*A^2*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*c+1/32*e^
4/(a*d-b*c)^5/g^5*B^2*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*c+d^4*e
/(a*d-b*c)^5/g^5*A^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a+2*d^4*e/(a*d
-b*c)^5/g^5*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*a-3*d^3*e^2/(a*d-b*
c)^5/g^5*A*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)
/(d*x+c)/d*e)*a-1/2*d*e^4/(a*d-b*c)^5/g^5*A*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*
b*c/d*e+b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+3*d^2*e^2/(a*d-b*c)^5/g^
5*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x
+c)/d*e)*c+2*d^2*e^3/(a*d-b*c)^5/g^5*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d
*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a-2*d*e^3/(a*d-b*c)^5/g^5*A*B*b
^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e
)*c-2*d^3*e/(a*d-b*c)^5/g^5*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(
b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b*c-1/8*d*e^4/(a*d-b*c)^5/g^5*B^2*b^3/(1/(d*x+
c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+2*d^4*e
/(a*d-b*c)^5/g^5*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-
b*c)/(d*x+c)/d*e)*a-d^3*e/(a*d-b*c)^5/g^5*B^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/
d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*b*c-2*d^3*e/(a*d-b*c)^5/g^5*B^
2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b
*c-2*d^3*e/(a*d-b*c)^5/g^5*A*B/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)*b*c+
3/2*d^2*e^2/(a*d-b*c)^5/g^5*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)
^2*c+2/3*d^2*e^3/(a*d-b*c)^5/g^5*A*B*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b
/d*e)^3*a-2/3*d*e^3/(a*d-b*c)^5/g^5*A*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*
e+b/d*e)^3*c-1/8*d*e^4/(a*d-b*c)^5/g^5*A*B*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c
/d*e+b/d*e)^4*a-3/2*d^3*e^2/(a*d-b*c)^5/g^5*A*B*b/(1/(d*x+c)*a*e-1/(d*x+c)*
b*c/d*e+b/d*e)^2*a-3/2*d^3*e^2/(a*d-b*c)^5/g^5*B^2*b/(1/(d*x+c)*a*e-1/(d*x+
c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*a+3/2*d^2*e^2/(a*d-b*c)
^5/g^5*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)
/(d*x+c)/d*e)*c+3/2*d^2*e^2/(a*d-b*c)^5/g^5*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c
)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*c-3/2*d^3*e^2/(a*d-b*c
)^5/g^5*B^2*b/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^2*ln(b/d*e+(a*d-b*c)/
(d*x+c)/d*e)^2*a+d^2*e^3/(a*d-b*c)^5/g^5*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b
*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*a+2/3*d^2*e^3/(a*d-b*c)^5
/g^5*B^2*b^2/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(
d*x+c)/d*e)*a-2/3*d*e^3/(a*d-b*c)^5/g^5*B^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*
c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-1/4*d*e^4/(a*d-b*c)^5/g^5*
B^2*b^3/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c
)/d*e)^2*a+1/2*e^4/(a*d-b*c)^5/g^5*A*B*b^4/(1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e
+b/d*e)^4*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c-d*e^3/(a*d-b*c)^5/g^5*B^2*b^3/(
1/(d*x+c)*a*e-1/(d*x+c)*b*c/d*e+b/d*e)^3*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*
c
```

maxima [B] time = 3.41, size = 2123, normalized size = 3.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algorithm="maxima
")
```

```
[Out] 1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2
 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d
^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^
3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d
^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*
d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*
g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4
```

```
*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/(
d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d
^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(1
3*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)
^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
+ a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2
*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*
d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*
a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^
4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*
log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*
b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*
b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g
^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 + 1/24*A*B*((12*b^3*d^3*x^3 -
 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 -
7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^
3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 -
 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3
- 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3
 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 -
3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c
) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a
^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d +
 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c
)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d
^4)*g^5)) - 1/4*B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^5*x^4 + 4
*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^2
/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4
*b*g^5)
```

mupad [**B**]   time = 10.30, size = 1881, normalized size = 3.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(a*g + b*g*x)^5,x)
```

```
[Out] (B*d^4*atan((B*d^4*(12*A + 25*B)*(24*b^5*c^4*g^5 - 24*a^4*b*d^4*g^5 - 48*a*
b^4*c^3*d*g^5 + 48*a^3*b^2*c*d^3*g^5)*1i)/(24*b*g^5*(a*d - b*c)^4*(25*B^2*d
^4 + 12*A*B*d^4)) + (B*d^5*x*(12*A + 25*B)*(b^4*c^3*g^5 - a^3*b*d^3*g^5 - 3
*a*b^3*c^2*d*g^5 + 3*a^2*b^2*c*d^2*g^5)*2i)/(g^5*(a*d - b*c)^4*(25*B^2*d^4
+ 12*A*B*d^4)))*(12*A + 25*B)*1i)/(12*b*g^5*(a*d - b*c)^4) - log((e*(a + b*
x))/(c + d*x))^2*(B^2/(4*b^2*g^5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 +
 4*a*b^2*x^3)) - (B^2*d^4)/(4*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2
- 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - (log((e*(a + b*x))/(c + d*x))*((A*B)/(
2*b^2*d*g^5) + (B^2*d^4*(a*(a*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3)
 + (a*(a*d - b*c))/(4*b*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a
^2*b*c*d^2)/(12*b*d^4)) + (4*a^4*d^4 + b^4*c^4 + 10*a^2*b^2*c^2*d^2 - 5*a*b
^3*c^3*d - 10*a^3*b*c*d^3)/(4*b*d^5)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*
b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (B^2*d^4*x^2*(b*(b*((4*a^2*
d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (4*a^2
*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*d^3) + (a*(a*d - b*c))/(2*d^2)) - a*((b^2*c
- a*b*d)/(4*d^2) - (b*(a*d - b*c))/(2*d^2)) + (b^3*c^2 + 4*a^2*b*d^2 - 5*a*
b^2*c*d)/(4*d^3)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^
3*c^3*d - 4*a^3*b*c*d^3)) - (B^2*d^4*x^3*(b*((b^2*c - a*b*d)/(4*d^2) - (b*(
```

```
a*d - b*c))/(2*d^2)) + (b^3*c - a*b^2*d)/(4*d^2)))/(2*b*g^5*(a^4*d^4 + b^4*
c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (B^2*d^4*x*(b*(
a*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)
) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + a*
(b*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2
)) + (4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*d^3) + (a*(a*d - b*c))/(2*d^2)) +
 (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(4*d^4)))/(2*b*g^5*
(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))))/
((4*a^3*x)/d + a^4/(b*d) + (b^3*x^4)/d + (6*a^2*b*x^2)/d + (4*a*b^2*x^3)/d)
 - ((72*A^2*a^3*d^3 - 72*A^2*b^3*c^3 + 415*B^2*a^3*d^3 - 9*B^2*b^3*c^3 + 30
0*A*B*a^3*d^3 - 36*A*B*b^3*c^3 + 216*A^2*a*b^2*c^2*d - 216*A^2*a^2*b*c*d^2
+ 55*B^2*a*b^2*c^2*d - 161*B^2*a^2*b*c*d^2 + 156*A*B*a*b^2*c^2*d - 276*A*B*
a^2*b*c*d^2)/(12*(a*d - b*c)) + (x^2*(163*B^2*a*b^2*d^3 - 13*B^2*b^3*c*d^2
+ 84*A*B*a*b^2*d^3 - 12*A*B*b^3*c*d^2))/(2*(a*d - b*c)) + (x*(271*B^2*a^2*b
*d^3 + 7*B^2*b^3*c^2*d - 53*B^2*a*b^2*c*d^2 + 156*A*B*a^2*b*d^3 + 12*A*B*b^
3*c^2*d - 60*A*B*a*b^2*c*d^2))/(3*(a*d - b*c)) + (d*x^3*(25*B^2*b^3*d^2 + 1
2*A*B*b^3*d^2))/(a*d - b*c))/(x*(96*a^3*b^4*c^2*g^5 + 96*a^5*b^2*d^2*g^5 -
192*a^4*b^3*c*d*g^5) + x^3*(96*a*b^6*c^2*g^5 + 96*a^3*b^4*d^2*g^5 - 192*a^2
*b^5*c*d*g^5) + x^4*(24*b^7*c^2*g^5 + 24*a^2*b^5*d^2*g^5 - 48*a*b^6*c*d*g^5
) + x^2*(144*a^2*b^5*c^2*g^5 + 144*a^4*b^3*d^2*g^5 - 288*a^3*b^4*c*d*g^5) +
 24*a^6*b*d^2*g^5 + 24*a^4*b^3*c^2*g^5 - 48*a^5*b^2*c*d*g^5)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

3.106 $\int \frac{\log\left(\frac{d(a+bx)}{b(c+dx)}\right)}{cf+dfx}\,dx$

Optimal. Leaf size=28

$$\frac{\mathrm{Li}_2\left(\frac{bc-ad}{b(c+dx)}\right)}{df}$$

```
[Out] polylog(2,(-a*d+b*c)/b/(d*x+c))/d/f
```

Rubi [A] time = 0.02, antiderivative size = 29, normalized size of antiderivative = 1.04, number of steps used = 1, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.034$, Rules used = {2447}

$$\frac{\mathrm{PolyLog}\left(2,1-\frac{d(a+bx)}{b(c+dx)}\right)}{df}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(d*(a + b*x))/(b*(c + d*x))]/(c*f + d*f*x),x]
```

```
[Out] PolyLog[2, 1 - (d*(a + b*x))/(b*(c + d*x))]/(d*f)
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\log\left(\frac{d(a+bx)}{b(c+dx)}\right)}{cf+dfx}\,dx = \frac{\mathrm{Li}_2\left(1-\frac{d(a+bx)}{b(c+dx)}\right)}{df}$$

Mathematica [B] time = 0.05, size = 114, normalized size = 4.07

$$\frac{\log\left(\frac{bc-ad}{bc+bdx}\right)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-2\log\left(\frac{d(a+bx)}{b(c+dx)}\right)+\log\left(\frac{bc-ad}{bc+bdx}\right)\right)-2\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)}{2df}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(d*(a + b*x))/(b*(c + d*x))]/(c*f + d*f*x),x]
```

```
[Out] (Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Lo
g[(d*(a + b*x))/(b*(c + d*x))] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/(2*d*f)
```

fricas [A] time = 0.68, size = 30, normalized size = 1.07

$$\frac{\mathrm{Li}_2\left(-\frac{bdx+ad}{bdx+bc}+1\right)}{df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x, algorithm="fricas")
```

```
[Out] dilog(-(b*d*x + a*d)/(b*d*x + b*c) + 1)/(d*f)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 0.05, size = 30, normalized size = 1.07

$$\frac{\operatorname{dilog}\left(\frac{ad-bc}{(dx+c)b}+1\right)}{df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x)
```

```
[Out] 1/d*dilog(1+(a*d-b*c)/b/(d*x+c))/f
```

maxima [**B**] time = 1.17, size = 158, normalized size = 5.64

$$-\frac{b\left(\frac{\log(dx+c)^2}{bf}-\frac{2\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\mathrm{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)}{bf}\right)}{2d}-\frac{b\left(\frac{d\log(bx+a)}{b}-\frac{d\log(dx+c)}{b}\right)\log\left(dfx+cf\right)}{d^2f}+\frac{\log\left(dfx+cf\right)\log}{df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x, algorithm="maxima")
```

```
[Out] -1/2*b*(log(d*x + c)^2/(b*f) - 2*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d
) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*f))/d - b*(d*log(b*x + a)/b
- d*log(d*x + c)/b)*log(d*f*x + c*f)/(d^2*f) + log(d*f*x + c*f)*log((b*x +
a)*d/((d*x + c)*b))/(d*f)
```

mupad [**B**] time = 4.25, size = 25, normalized size = 0.89

$$\frac{\mathrm{Li}_2\left(\frac{d\,(a+b\,x)}{b\,(c+d\,x)}\right)}{d\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log((d*(a + b*x))/(b*(c + d*x)))/(c*f + d*f*x),x)
```

```
[Out] dilog((d*(a + b*x))/(b*(c + d*x)))/(d*f)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\log\left(\frac{ad}{bc+bdx}+\frac{bdx}{bc+bdx}\right)}{c+dx}\, dx}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x)
```

```
[Out] Integral(log(a*d/(b*c + b*d*x) + b*d*x/(b*c + b*d*x))/(c + d*x), x)/f
```

3.107 $\int \frac{\log\left(1+\frac{1}{a+bx}\right)}{a+bx} \, dx$

Optimal. Leaf size=15

$$\frac{\text{Li}_2\left(-\frac{1}{a+bx}\right)}{b}$$

```
[Out] polylog(2,-1/(b*x+a))/b
```

Rubi [A] time = 0.01, antiderivative size = 15, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2447}

$$\frac{\text{PolyLog}\left(2,-\frac{1}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[Log[1 + (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] PolyLog[2, -(a + b*x)^(-1)]/b
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\log\left(1+\frac{1}{a+bx}\right)}{a+bx} \, dx = \frac{\text{Li}_2\left(-\frac{1}{a+bx}\right)}{b}$$

Mathematica [B] time = 0.01, size = 140, normalized size = 9.33

$$-\frac{\text{Li}_2(-a-bx)}{b}+\frac{\log^2\left(\frac{ab-(a+1)b}{b(a+bx)}\right)}{2b}+\frac{\log\left(\frac{b(-a-bx-1)}{(-a-1)b+ab}\right)\log\left(\frac{ab-(a+1)b}{b(a+bx)}\right)}{b}-\frac{\log\left(\frac{a+bx+1}{a+bx}\right)\log\left(\frac{ab-(a+1)b}{b(a+bx)}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[1 + (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] (Log[(b*(-1 - a - b*x))/((-1 - a)*b + a*b)]*Log[(a*b - (1 + a)*b)/(b*(a + b
*x))])/b + Log[(a*b - (1 + a)*b)/(b*(a + b*x))]^2/(2*b) - (Log[(a*b - (1 +
a)*b)/(b*(a + b*x))]*Log[(1 + a + b*x)/(a + b*x)])/b - PolyLog[2, -a - b*x]
/b
```

fricas [A] time = 0.66, size = 22, normalized size = 1.47

$$\frac{\text{Li}_2\left(-\frac{bx+a+1}{bx+a}+1\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1+1/(b*x+a))/(b*x+a),x, algorithm="fricas")
```

```
[Out] dilog(-(b*x + a + 1)/(b*x + a) + 1)/b
```

giac [B] time = 39.25, size = 320, normalized size = 21.33

$$\frac{1}{2}\left((a+1)b-ab\right)^{2}\left(\frac{\log\left(\frac{|bx+a+1|}{|bx+a|}\right)}{b^{4}}-\frac{\log\left(\left|\frac{bx+a+1}{bx+a}-1\right|\right)}{b^{4}}-\frac{1}{b^{4}\left(\frac{bx+a+1}{bx+a}-1\right)}-\frac{\log\left(\frac{1}{a-\frac{\left(\frac{\left(a-\frac{\left(\frac{(bx+a+1)a}{bx+a}-a-1\right)b}{\frac{(bx+a+1)b}{bx+a}-b}+1\right)a}{a-\frac{\left(\frac{(bx+a+1)a}{bx+a}-a-1\right)b}{\frac{(bx+a+1)b}{bx+a}-b}}-a-1\right)b}{\frac{\left(a-\frac{\left(\frac{(bx+a+1)a}{bx+a}-a-1\right)b}{\frac{(bx+a+1)b}{bx+a}-b}+1\right)b}{a-\frac{\left(\frac{(bx+a+1)a}{bx+a}-a-1\right)b}{\frac{(bx+a+1)b}{bx+a}-b}}-b}}+1\right)}{b^{4}\left(\frac{bx+a+1}{bx+a}-1\right)^{2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1+1/(b*x+a))/(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*((a + 1)*b - a*b)^2*(log(abs(b*x + a + 1)/abs(b*x + a))/b^4 - log(abs((
b*x + a + 1)/(b*x + a) - 1))/b^4 - 1/(b^4*((b*x + a + 1)/(b*x + a) - 1)) -
log(1/(a - ((a - ((b*x + a + 1)*a/(b*x + a) - a - 1)*b/((b*x + a + 1)*b/(b*
x + a) - b) + 1)*a/(a - ((b*x + a + 1)*a/(b*x + a) - a - 1)*b/((b*x + a + 1
)*b/(b*x + a) - b)) - a - 1)*b/((a - ((b*x + a + 1)*a/(b*x + a) - a - 1)*b/
((b*x + a + 1)*b/(b*x + a) - b) + 1)*b/(a - ((b*x + a + 1)*a/(b*x + a) - a
- 1)*b/((b*x + a + 1)*b/(b*x + a) - b)) - b)) + 1)/(b^4*((b*x + a + 1)/(b*x
 + a) - 1)^2))
```

maple [A] time = 0.04, size = 15, normalized size = 1.00

$$\frac{\operatorname{dilog}\left(1+\frac{1}{bx+a}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(1+1/(b*x+a))/(b*x+a),x)
```

```
[Out] 1/b*dilog(1+1/(b*x+a))
```

maxima [B] time = 1.21, size = 61, normalized size = 4.07

$$\frac{2\,\log\left(bx+a+1\right)\log\left(bx+a\right)-\log\left(bx+a\right)^{2}}{2\,b}-\frac{\log\left(bx+a+1\right)\log\left(bx+a\right)+\mathrm{Li}_{2}\left(-bx-a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1+1/(b*x+a))/(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(2*log(b*x + a + 1)*log(b*x + a) - log(b*x + a)^2)/b - (log(b*x + a + 1
)*log(b*x + a) + dilog(-b*x - a))/b
```

mupad [B] time = 4.03, size = 15, normalized size = 1.00

$$\frac{\mathrm{polylog}\left(2,-\frac{1}{a+b\,x}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(1/(a + b*x) + 1)/(a + b*x),x)
```

```
[Out] polylog(2, -1/(a + b*x))/b
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(1+\frac{1}{a+bx}\right)}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(1+1/(b*x+a))/(b*x+a),x)
```

```
[Out] Integral(log(1 + 1/(a + b*x))/(a + b*x), x)
```

3.108 $\int \frac{\log\left(1-\frac{1}{a+bx}\right)}{a+bx}\,dx$

Optimal. Leaf size=13

$$\frac{\text{Li}_2\left(\frac{1}{a+bx}\right)}{b}$$

```
[Out] polylog(2,1/(b*x+a))/b
```

Rubi [A] time = 0.01, antiderivative size = 13, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.050$, Rules used = {2447}

$$\frac{\text{PolyLog}\left(2,\frac{1}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[Log[1 - (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] PolyLog[2, (a + b*x)^(-1)]/b
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\log\left(1-\frac{1}{a+bx}\right)}{a+bx}\,dx = \frac{\text{Li}_2\left(\frac{1}{a+bx}\right)}{b}$$

Mathematica [B] time = 0.02, size = 133, normalized size = 10.23

$$-\frac{\text{Li}_2(a+bx)}{b}+\frac{\log^2\left(\frac{ab-(a-1)b}{b(a+bx)}\right)}{2b}+\frac{\log\left(\frac{b(a+bx-1)}{(a-1)b-ab}\right)\log\left(\frac{ab-(a-1)b}{b(a+bx)}\right)}{b}-\frac{\log\left(\frac{a+bx-1}{a+bx}\right)\log\left(\frac{ab-(a-1)b}{b(a+bx)}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[1 - (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] (Log[(b*(-1 + a + b*x))/((-1 + a)*b - a*b)]*Log[(-((-1 + a)*b) + a*b)/(b*(a
 + b*x))])/b + Log[(-((-1 + a)*b) + a*b)/(b*(a + b*x))]^2/(2*b) - (Log[(-((
-1 + a)*b) + a*b)/(b*(a + b*x))]*Log[(-1 + a + b*x)/(a + b*x)])/b - PolyLog
[2, a + b*x]/b
```

fricas [A] time = 0.81, size = 22, normalized size = 1.69

$$\frac{\text{Li}_2\left(-\frac{bx+a-1}{bx+a}+1\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-1/(b*x+a))/(b*x+a),x, algorithm="fricas")
```

```
[Out] dilog(-(b*x + a - 1)/(b*x + a) + 1)/b
```

giac [B] time = 30.47, size = 322, normalized size = 24.77

$$-\frac{1}{2}\left((a-1)b-ab\right)^{2}\left(\frac{\log\left(\frac{|bx+a-1|}{|bx+a|}\right)}{b^{4}}-\frac{\log\left(\left|\frac{bx+a-1}{bx+a}-1\right|\right)}{b^{4}}-\frac{1}{b^{4}\left(\frac{bx+a-1}{bx+a}-1\right)}-\frac{\log\left(-\frac{1}{a-\frac{\left(\frac{\left(a-\frac{\left(\frac{(bx+a-1)a}{bx+a}-a+1\right)b}{\frac{(bx+a-1)b}{bx+a}-b}-1\right)a}{a-\frac{\left(\frac{(bx+a-1)a}{bx+a}-a+1\right)b}{\frac{(bx+a-1)b}{bx+a}-b}}-a+1\right)b}{\frac{\left(a-\frac{\left(\frac{(bx+a-1)a}{bx+a}-a+1\right)b}{\frac{(bx+a-1)b}{bx+a}-b}-1\right)b}{a-\frac{\left(\frac{(bx+a-1)a}{bx+a}-a+1\right)b}{\frac{(bx+a-1)b}{bx+a}-b}}-b}}+\right.}{b^{4}\left(\frac{bx+a-1}{bx+a}-1\right)^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-1/(b*x+a))/(b*x+a),x, algorithm="giac")
```

```
[Out] -1/2*((a - 1)*b - a*b)^2*(log(abs(b*x + a - 1)/abs(b*x + a))/b^4 - log(abs(
(b*x + a - 1)/(b*x + a) - 1))/b^4 - 1/(b^4*((b*x + a - 1)/(b*x + a) - 1)) -
 log(-1/(a - ((a - ((b*x + a - 1)*a/(b*x + a) - a + 1)*b/((b*x + a - 1)*b/(
b*x + a) - b) - 1)*a/(a - ((b*x + a - 1)*a/(b*x + a) - a + 1)*b/((b*x + a -
 1)*b/(b*x + a) - b)) - a + 1)*b/((a - ((b*x + a - 1)*a/(b*x + a) - a + 1)*
b/((b*x + a - 1)*b/(b*x + a) - b) - 1)*b/(a - ((b*x + a - 1)*a/(b*x + a) -
a + 1)*b/((b*x + a - 1)*b/(b*x + a) - b)) - b)) + 1)/(b^4*((b*x + a - 1)/(b
*x + a) - 1)^2))
```

maple [A] time = 0.04, size = 17, normalized size = 1.31

$$\frac{\operatorname{dilog}\left(1-\frac{1}{bx+a}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(1-1/(b*x+a))/(b*x+a),x)
```

```
[Out] 1/b*dilog(1-1/(b*x+a))
```

maxima [B] time = 1.30, size = 59, normalized size = 4.54

$$-\frac{\log\left(bx+a\right)^{2}-2\,\log\left(bx+a\right)\log\left(bx+a-1\right)}{2\,b}-\frac{\log\left(bx+a\right)\log\left(-bx-a+1\right)+\mathrm{Li}_{2}\left(bx+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-1/(b*x+a))/(b*x+a),x, algorithm="maxima")
```

```
[Out] -1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(b*x + a - 1))/b - (log(b*x + a)*l
og(-b*x - a + 1) + dilog(b*x + a))/b
```

mupad [B] time = 4.23, size = 13, normalized size = 1.00

$$\frac{\mathrm{polylog}\left(2,\frac{1}{a+b\,x}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(1 - 1/(a + b*x))/(a + b*x),x)
```

```
[Out] polylog(2, 1/(a + b*x))/b
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(1-\frac{1}{a+bx}\right)}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(1-1/(b*x+a))/(b*x+a),x)
```

```
[Out] Integral(log(1 - 1/(a + b*x))/(a + b*x), x)
```

3.109 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x] + b^2*g^2*Defer[Int
][x^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+\left(b^2g^2\right)\int\end{aligned}$$

Mathematica [A] time = 0.62, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

fricas [A] time = 0.79, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((b*e*x + a*e)/(d*x +
c)) + A), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.15, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2}}{B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2}}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2}{A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$g^{2}\left(\int \frac{a^{2}}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+\int \frac{b^{2}x^{2}}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+\int \frac{2abx}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] g**2*(Integral(a**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Inte
gral(b**2*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integral(
2*a*b*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x))
```

3.110 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=33

$$\text{Int}\left(\frac{ag+bgx}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= (ag)\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

fricas [A] time = 1.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[A]** time = 1.02, size = 0, normalized size = 0.00

$$\int \frac{bgx+ag}{B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx+ag}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

mupad **[A]** time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g+b\,g\,x}{A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(a + b*x))/(c + d*x))), x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int \frac{a}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+\int \frac{bx}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] g*(Integral(a/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integral(b
*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x))
```

3.111 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=35

$$\operatorname{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

fricas [A] time = 1.64, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((b*e*x + a*e)/(d*x + c)
)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.18, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa+Abx+Ba\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)+Bbx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Integral(1/(A*a + A*b*x + B*a*log(a*e/(c + d*x) + b*e*x/(c + d*x)) + B*b*x*
log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)/g
```

3.112 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=50

$$\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{Bg^2(bc-ad)}$$

```
[Out] e*exp(A/B)*Ei((-A-B*ln(e*(b*x+a)/(d*x+c)))/B)/B/(-a*d+b*c)/g^2
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx = \int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.10, size = 52, normalized size = 1.04

$$\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{bBcg^2-aBdg^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] (e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)])/(b*B*c
*g^2 - a*B*d*g^2)
```

fricas [A] time = 1.35, size = 47, normalized size = 0.94

$$\frac{ee^{\frac{A}{B}}\,\text{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{A}{B}\right)}}{bex+ae}\right)}{(Bbc-Bad)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas
")
```

```
[Out] e*e^(A/B)*log_integral((d*x + c)*e^(-A/B)/(b*e*x + a*e))/((B*b*c - B*a*d)*g
^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{2}+2Aabx+Ab^{2}x^{2}+Ba^{2}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)+2Babx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)+Bb^{2}x^{2}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Integral(1/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(a*e/(c + d*x) + b
*e*x/(c + d*x)) + 2*B*a*b*x*log(a*e/(c + d*x) + b*e*x/(c + d*x)) + B*b**2*x
**2*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)/g**2
```

3.113 $\displaystyle\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=107

$$\frac{be^2e^{\frac{2A}{B}}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)}{Bg^3(bc-ad)^2}-\frac{dee^{A/B}\operatorname{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{Bg^3(bc-ad)^2}$$

```
[Out] b*e^2*exp(2*A/B)*Ei(-2*(A+B*ln(e*(b*x+a)/(d*x+c)))/B)/B/(-a*d+b*c)^2/g^3-d*
e*exp(A/B)*Ei((-A-B*ln(e*(b*x+a)/(d*x+c)))/B)/B/(-a*d+b*c)^2/g^3
```

Rubi [F] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.17, size = 89, normalized size = 0.83

$$\frac{ee^{A/B}\left(bee^{A/B}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)-d\operatorname{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)\right)}{Bg^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] (e*E^(A/B)*(b*e*E^(A/B)*ExpIntegralEi[(-2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/B] - d*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)]))/(B*(
b*c - a*d)^2*g^3)
```

fricas [A] time = 0.66, size = 130, normalized size = 1.21

$$\frac{be^2e^{\left(\frac{2A}{B}\right)}\operatorname{log\_integral}\left(\frac{\left(d^2x^2+2\,cdx+c^2\right)e^{\left(-\frac{2A}{B}\right)}}{b^2e^2x^2+2\,abe^2x+a^2e^2}\right)-dee^{\frac{A}{B}}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{A}{B}\right)}}{bex+ae}\right)}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas
")
```

```
[Out] (b*e^2*e^(2*A/B)*log_integral((d^2*x^2 + 2*c*d*x + c^2)*e^(-2*A/B)/(b^2*e^2
*x^2 + 2*a*b*e^2*x + a^2*e^2)) - d*e*e^(A/B)*log_integral((d*x + c)*e^(-A/B
)/(b*e*x + a*e)))/((B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*d^2)*g^3)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**F**] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{3}+3Aa^{2}bx+3Aab^{2}x^{2}+Ab^{3}x^{3}+Ba^{3}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)+3Ba^{2}bx\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)+3Bab^{2}x^{2}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)+Bb^{3}x^{3}\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx}{g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Integral(1/(A*a**3 + 3*A*a**2*b*x + 3*A*a*b**2*x**2 + A*b**3*x**3 + B*a**3*
log(a*e/(c + d*x) + b*e*x/(c + d*x)) + 3*B*a**2*b*x*log(a*e/(c + d*x) + b*e
*x/(c + d*x)) + 3*B*a*b**2*x**2*log(a*e/(c + d*x) + b*e*x/(c + d*x)) + B*b*
*3*x**3*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)/g**3
```

3.114 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x] + b^2*g^2*Defer[I
nt][x^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+\Big(\end{aligned}$$

Mathematica [A] time = 1.35, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

fricas [A] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((b*e*x + a*e)/(d*x
+ c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x + c)) + A^2), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 1.09, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2}}{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^{3}dg^{2}x^{4}+a^{3}cg^{2}+\left(b^{3}cg^{2}+3\,ab^{2}dg^{2}\right)x^{3}+3\left(ab^{2}cg^{2}+a^{2}bdg^{2}\right)x^{2}+\left(3\,a^{2}bcg^{2}+a^{3}dg^{2}\right)x}{(bc-ad)B^{2}\log\left(bx+a\right)-(bc-ad)B^{2}\log\left(dx+c\right)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^{2}}+\int\frac{4\,b^{3}dg}{(bc-ad)B^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] -(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^2*c*
g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/((b*c - a*d)*B^2*lo
g(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) -
 a*d*log(e))*B^2) + integrate((4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2 + a^3*d*g^2
+ 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*g^2)*x)/((b*
c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B
+ (b*c*log(e) - a*d*log(e))*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2}{{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^{3}cg^{2}+a^{3}dg^{2}x+3a^{2}bcg^{2}x+3a^{2}bdg^{2}x^{2}+3ab^{2}cg^{2}x^{2}+3ab^{2}dg^{2}x^{3}+b^{3}cg^{2}x^{3}+b^{3}dg^{2}x^{4}}{ABad-ABbc+\left(B^{2}ad-B^{2}bc\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}-\frac{g^{2}\left(\int\frac{a^{3}d}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (a**3*c*g**2 + a**3*d*g**2*x + 3*a**2*b*c*g**2*x + 3*a**2*b*d*g**2*x**2 + 3
*a*b**2*c*g**2*x**2 + 3*a*b**2*d*g**2*x**3 + b**3*c*g**2*x**3 + b**3*d*g**2
*x**4)/(A*B*a*d - A*B*b*c + (B**2*a*d - B**2*b*c)*log(e*(a + b*x)/(c + d*x)
)) - g**2*(Integral(a**3*d/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)
 + Integral(3*a**2*b*c/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + I
ntegral(3*b**3*c*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + In
tegral(4*b**3*d*x**3/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Int
egral(6*a*b**2*c*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integ
ral(9*a*b**2*d*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Inte
gral(6*a**2*b*d*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x))/(B*(a*d
 - b*c))
```

3.115 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=33

$$\operatorname{Int}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

fricas [A] time = 0.95, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{bgx+ag}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e
*x + a*e)/(d*x + c)) + A^2), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[A]** time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{\left(B \ln \left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima **[A]** time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^2dgx^3 + a^2cg + \left(b^2cg + 2\,abdg\right)x^2 + \left(2\,abcg + a^2dg\right)x}{(bc - ad)B^2 \log\left(bx + a\right) - (bc - ad)B^2 \log\left(dx + c\right) + (bc - ad)AB + \left(bc\log(e) - ad\log(e)\right)B^2} + \int \frac{}{(bc - ad)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*d*g)
*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a
*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate((3*b^2*d*g*x^2 + 2*a*b
*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/((b*c - a*d)*B^2*log(b*x + a) -
 (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))
*B^2), x)
```

mupad **[A]** time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g + b\,g\,x}{{\left(A + B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^2cg + a^2dgx + 2abcgx + 2abdgx^2 + b^2cgx^2 + b^2dgx^3}{ABad - ABbc + \left(B^2ad - B^2bc\right)\log\left(\frac{e(a+bx)}{c+dx}\right)} - \frac{g\left(\int \frac{a^2d}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\, dx + \int \frac{2abc}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\, dx + \int\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (a**2*c*g + a**2*d*g*x + 2*a*b*c*g*x + 2*a*b*d*g*x**2 + b**2*c*g*x**2 + b**
2*d*g*x**3)/(A*B*a*d - A*B*b*c + (B**2*a*d - B**2*b*c)*log(e*(a + b*x)/(c +
 d*x))) - g*(Integral(a**2*d/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))),
x) + Integral(2*a*b*c/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + In
tegral(2*b**2*c*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integr
al(3*b**2*d*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integra
l(4*a*b*d*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x))/(B*(a*d - b*c
))
```

3.116 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx = \int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.63, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

fricas [A] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(
d*x + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

maple [A] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$d\int \frac{1}{\left(bcg - adg\right)B^2\log\left(bx + a\right) - \left(bcg - adg\right)B^2\log\left(dx + c\right) + \left(bcg - adg\right)AB + \left(bcg\log(e) - adg\log(e)\right)B^2}\,dx-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] d*integrate(1/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d
*x + c) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2), x) - (d
*x + c)/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d*x + c
) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g + b\,g\,x\right)\,\left(A + B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{c + dx}{ABadg - ABbcg + \left(B^2adg - B^2bcg\right)\log\left(\frac{e(a+bx)}{c+dx}\right)} - \frac{d\int \frac{1}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx}{Bg\left(ad - bc\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (c + d*x)/(A*B*a*d*g - A*B*b*c*g + (B**2*a*d*g - B**2*b*c*g)*log(e*(a + b*x
)/(c + d*x))) - d*Integral(1/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))),
x)/(B*g*(a*d - b*c))
```

3.117 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=103

$$-\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{B^2g^2(bc-ad)}-\frac{c+dx}{Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}$$

```
[Out] -e*exp(A/B)*Ei((-A-B*ln(e*(b*x+a)/(d*x+c)))/B)/B^2/(-a*d+b*c)/g^2+(-d*x-c)/
B/(-a*d+b*c)/g^2/(b*x+a)/(A+B*ln(e*(b*x+a)/(d*x+c)))
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.18, size = 87, normalized size = 0.84

$$\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)+\frac{B(c+dx)}{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}}{B^2g^2(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] (e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)] + (B*(c
 + d*x))/((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(B^2*(-(b*c) + a
*d)*g^2)
```

fricas [A] time = 0.74, size = 199, normalized size = 1.93

$$-\frac{Bdx+Bc+\left((Bbex+Bae)e^{\frac{A}{B}}\log\left(\frac{bex+ae}{dx+c}\right)+(Abex+Aae)e^{\frac{A}{B}}\right)\text{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{A}{B}\right)}}{bex+ae}\right)}{\left(AB^2b^2c-AB^2abd\right)g^2x+\left(AB^2abc-AB^2a^2d\right)g^2+\left(\left(B^3b^2c-B^3abd\right)g^2x+\left(B^3abc-B^3a^2d\right)g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fric
as")
```

```
[Out] -(B*d*x + B*c + ((B*b*e*x + B*a*e)*e^(A/B)*log((b*e*x + a*e)/(d*x + c)) + (
A*b*e*x + A*a*e)*e^(A/B))*log_integral((d*x + c)*e^(-A/B)/(b*e*x + a*e)))/(
(A*B^2*b^2*c - A*B^2*a*b*d)*g^2*x + (A*B^2*a*b*c - A*B^2*a^2*d)*g^2 + ((B^3
*b^2*c - B^3*a*b*d)*g^2*x + (B^3*a*b*c - B^3*a^2*d)*g^2)*log((b*e*x + a*e)/
(d*x + c)))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

maple [F] time = 1.34, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{2}\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(abcg^{2} - a^{2}dg^{2}\right)AB + \left(abcg^{2}\log(e) - a^{2}dg^{2}\log(e)\right)B^{2} + \Big(\left(b^{2}cg^{2} - abdg^{2}\right)AB + \left(b^{2}cg^{2}\log(e) - abdg^{2}\log(e)\right)B^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxi
ma")
```

```
[Out] -(d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2*log
(e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2*log
(e))*B^2)*x + ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^2)
*log(b*x + a) - ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^
2)*log(d*x + c)) + integrate(-1/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2 + (B^2*b^
2*g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b*g^2)*x +
(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a) - (B^2*b^2*g
^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{c+dx}{ABa^2dg^2 - ABabcg^2 + ABabdg^2x - ABb^2cg^2x + \left(B^2a^2dg^2 - B^2abcg^2 + B^2abdg^2x - B^2b^2cg^2x\right)\log\left(\frac{e(a+bx)}{c+dx}\right)} -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (c + d*x)/(A*B*a**2*d*g**2 - A*B*a*b*c*g**2 + A*B*a*b*d*g**2*x - A*B*b**2*c
*g**2*x + (B**2*a**2*d*g**2 - B**2*a*b*c*g**2 + B**2*a*b*d*g**2*x - B**2*b*
*2*c*g**2*x)*log(e*(a + b*x)/(c + d*x))) - Integral(1/(A*a**2 + 2*A*a*b*x +
 A*b**2*x**2 + B*a**2*log(a*e/(c + d*x) + b*e*x/(c + d*x)) + 2*B*a*b*x*log(
a*e/(c + d*x) + b*e*x/(c + d*x)) + B*b**2*x**2*log(a*e/(c + d*x) + b*e*x/(c
 + d*x))), x)/(B*g**2)
```

3.118 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=212

$$-\frac{2be^2e^{\frac{2A}{B}}\text{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)}{B^2g^3(bc-ad)^2}+\frac{dee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{B^2g^3(bc-ad)^2}-\frac{b(c+dx)^2}{Bg^3(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}+\frac{\quad}{Bg^3}$$

```
[Out] -2*b*e^2*exp(2*A/B)*Ei(-2*(A+B*ln(e*(b*x+a)/(d*x+c)))/B)/B^2/(-a*d+b*c)^2/g
^3+d*e*exp(A/B)*Ei((-A-B*ln(e*(b*x+a)/(d*x+c)))/B)/B^2/(-a*d+b*c)^2/g^3+d*(
d*x+c)/B/(-a*d+b*c)^2/g^3/(b*x+a)/(A+B*ln(e*(b*x+a)/(d*x+c)))-b*(d*x+c)^2/B
/(-a*d+b*c)^2/g^3/(b*x+a)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))
```

Rubi [F] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.65, size = 136, normalized size = 0.64

$$\frac{-2be^2e^{\frac{2A}{B}}\text{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)+dee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)-\frac{B(c+dx)(bc-ad)}{(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}}{B^2g^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] (-2*b*e^2*E^((2*A)/B)*ExpIntegralEi[(-2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/B] + d*e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)
] - (B*(b*c - a*d)*(c + d*x))/((a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])))/(B^2*(b*c - a*d)^2*g^3)
```

fricas [B] time = 0.62, size = 570, normalized size = 2.69

$$-\frac{Bbc^2-Bacd+\left(Bbcd-Bad^2\right)x-\left(\left(Bb^2dex^2+2\,Babdex+Ba^2de\right)e^{\frac{A}{B}}\log\left(\frac{bex+ae}{dx+c}\right)+\left(Ab^2dex^2+2\,Aabdex+Aa^2\right.\right.}{\left(AB^2b^4c^2-2\,AB^2ab^3cd+AB^2a^2b^2d^2\right)g^3x^2+2\left(AB^2ab^3c^2-2\,AB^2a^2b^2cd+AB^2a^3bd^2\right)g^3x+\left(AB^2a^2b^2c^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fric
as")
```

```
[Out] -(B*b*c^2 - B*a*c*d + (B*b*c*d - B*a*d^2)*x - ((B*b^2*d*e*x^2 + 2*B*a*b*d*e
*x + B*a^2*d*e)*e^(A/B)*log((b*e*x + a*e)/(d*x + c)) + (A*b^2*d*e*x^2 + 2*A
*a*b*d*e*x + A*a^2*d*e)*e^(A/B))*log_integral((d*x + c)*e^(-A/B)/(b*e*x + a
*e)) + 2*((B*b^3*e^2*x^2 + 2*B*a*b^2*e^2*x + B*a^2*b*e^2)*e^(2*A/B)*log((b*
e*x + a*e)/(d*x + c)) + (A*b^3*e^2*x^2 + 2*A*a*b^2*e^2*x + A*a^2*b*e^2)*e^(
2*A/B))*log_integral((d^2*x^2 + 2*c*d*x + c^2)*e^(-2*A/B)/(b^2*e^2*x^2 + 2*
a*b*e^2*x + a^2*e^2)))/((A*B^2*b^4*c^2 - 2*A*B^2*a*b^3*c*d + A*B^2*a^2*b^2*
d^2)*g^3*x^2 + 2*(A*B^2*a*b^3*c^2 - 2*A*B^2*a^2*b^2*c*d + A*B^2*a^3*b*d^2)*
g^3*x + (A*B^2*a^2*b^2*c^2 - 2*A*B^2*a^3*b*c*d + A*B^2*a^4*d^2)*g^3 + ((B^3
*b^4*c^2 - 2*B^3*a*b^3*c*d + B^3*a^2*b^2*d^2)*g^3*x^2 + 2*(B^3*a*b^3*c^2 -
2*B^3*a^2*b^2*c*d + B^3*a^3*b*d^2)*g^3*x + (B^3*a^2*b^2*c^2 - 2*B^3*a^3*b*c
*d + B^3*a^4*d^2)*g^3)*log((b*e*x + a*e)/(d*x + c)))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{3} \left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

maple [F] time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{3} \left(B \ln\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\bigl(a^{2}bcg^{3} - a^{3}dg^{3}\bigr)AB + \bigl(a^{2}bcg^{3}\log(e) - a^{3}dg^{3}\log(e)\bigr)B^{2} + \Bigl(\bigl(b^{3}cg^{3} - ab^{2}dg^{3}\bigr)AB + \bigl(b^{3}cg^{3}\log(e) - ab^{2}dg^{3}\,\mathrm{lo}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxi
ma")
```

```
[Out] -(d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d*g^3
*log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b^2*d
*g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g^3*l
og(e) - a^2*b*d*g^3*log(e))*B^2)*x + ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2
*(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(b*x
 + a) - ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*
B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate((b*d*x + 2
*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e) - a*b^3*d*g
^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*g^3*log(e) -
```

```
 a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B + (a*b^3*c*g^
3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 - a^3*b*d*g^3
)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x + ((b^4*c*g^3 -
a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2
*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*log(b*x + a) -
 ((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x
^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)
*log(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{\left(a g + b g x\right)^{3} \left(A + B \ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.119 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx$

Optimal. Leaf size=182

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{5b}-\frac{2Bg^4(bc-ad)^5\log(c+dx)}{5bd^5}+\frac{2Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}+$$

```
[Out] 2/5*B*(-a*d+b*c)^4*g^4*x/d^4-1/5*B*(-a*d+b*c)^3*g^4*(b*x+a)^2/b/d^3+2/15*B*
(-a*d+b*c)^2*g^4*(b*x+a)^3/b/d^2-1/10*B*(-a*d+b*c)*g^4*(b*x+a)^4/b/d+1/5*g^
4*(b*x+a)^5*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b-2/5*B*(-a*d+b*c)^5*g^4*ln(d*x
+c)/b/d^5
```

Rubi [A] time = 0.11, antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{5b}+\frac{2Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}+\frac{2Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (2*B*(b*c - a*d)^4*g^4*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(5*b*
d^3) + (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g^4*
(a + b*x)^4)/(10*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]))/(5*b) - (2*B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5b} - \frac{B\int \frac{2(bc-ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg} \\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int \frac{(a+bx)^4}{c+dx}\,dx}{5b} \\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int \Bigl(-\frac{b(bc-ad)^3}{d^4}}{} \\
&= \frac{2B(bc-ad)^4g^4x}{5d^4} - \frac{B(bc-ad)^3g^4(a+bx)^2}{5bd^3} + \frac{2B(bc-ad)^2g^4(a+b}{15bd^2}
\end{aligned}
$$

Mathematica [A] time = 0.09, size = 144, normalized size = 0.79

$$\frac{g^4\Bigl((a+bx)^5\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{B(bc-ad)\bigl(4d^3(a+bx)^3(bc-ad)-6d^2(a+bx)^2(bc-ad)^2+12bdx(bc-ad)^3-12(bc-ad)^4\log(c+dx)-3d^4(a+b}{6d^5}}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(b*c - a*d)
*(12*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a
*d)*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]))/(6*d^
5)))/(5*b)
```

fricas [B] time = 0.78, size = 454, normalized size = 2.49

$$\frac{6\,Ab^5d^5g^4x^5 + 12\,Ba^5d^5g^4\log(bx+a) - 3\left(Bb^5cd^4 - (10\,A+B)ab^4d^5\right)g^4x^4 + 4\left(Bb^5c^2d^3 - 5\,Bab^4cd^4 + (15\,A + 4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] 1/30*(6*A*b^5*d^5*g^4*x^5 + 12*B*a^5*d^5*g^4*log(b*x + a) - 3*(B*b^5*c*d^4
- (10*A + B)*a*b^4*d^5)*g^4*x^4 + 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 + (15*
A + 4*B)*a^2*b^3*d^5)*g^4*x^3 - 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 10*B
*a^2*b^3*c*d^4 - 2*(5*A + 3*B)*a^3*b^2*d^5)*g^4*x^2 + 6*(2*B*b^5*c^4*d - 10
*B*a*b^4*c^3*d^2 + 20*B*a^2*b^3*c^2*d^3 - 20*B*a^3*b^2*c*d^4 + (5*A + 8*B)*
a^4*b*d^5)*g^4*x - 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 -
 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 6*(B*b^5*d^5*g^
4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*d^5
*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^
2 + 2*c*d*x + c^2)))/(b*d^5)
```

giac [B] time = 72.97, size = 496, normalized size = 2.73

$$\frac{2\,Ba^5g^4\log(bx+a)}{5\,b} + \frac{1}{5}\left(Ab^4g^4 + Bb^4g^4\right)x^5 - \frac{\left(Bb^4cg^4 - 10\,Aab^3dg^4 - 11\,Bab^3dg^4\right)x^4}{10\,d} + \frac{2\left(Bb^4c^2g^4 - 5\,Bab^3cdg^4 +\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] 2/5*B*a^5*g^4*log(b*x + a)/b + 1/5*(A*b^4*g^4 + B*b^4*g^4)*x^5 - 1/10*(B*b^
4*c*g^4 - 10*A*a*b^3*d*g^4 - 11*B*a*b^3*d*g^4)*x^4/d + 2/15*(B*b^4*c^2*g^4
- 5*B*a*b^3*c*d*g^4 + 15*A*a^2*b^2*d^2*g^4 + 19*B*a^2*b^2*d^2*g^4)*x^3/d^2
+ 1/5*(B*b^4*g^4*x^5 + 5*B*a*b^3*g^4*x^4 + 10*B*a^2*b^2*g^4*x^3 + 10*B*a^3*
b*g^4*x^2 + 5*B*a^4*g^4*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x
 + c^2)) - 1/5*(B*b^4*c^3*g^4 - 5*B*a*b^3*c^2*d*g^4 + 10*B*a^2*b^2*c*d^2*g^
4 - 10*A*a^3*b*d^3*g^4 - 16*B*a^3*b*d^3*g^4)*x^2/d^3 + 1/5*(2*B*b^4*c^4*g^4
 - 10*B*a*b^3*c^3*d*g^4 + 20*B*a^2*b^2*c^2*d^2*g^4 - 20*B*a^3*b*c*d^3*g^4 +
 5*A*a^4*d^4*g^4 + 13*B*a^4*d^4*g^4)*x/d^4 - 2/5*(B*b^4*c^5*g^4 - 5*B*a*b^3
*c^4*d*g^4 + 10*B*a^2*b^2*c^3*d^2*g^4 - 10*B*a^3*b*c^2*d^3*g^4 + 5*B*a^4*c*
d^4*g^4)*log(-d*x - c)/d^5
```

maple [B] time = 0.19, size = 1606, normalized size = 8.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] -40/d^2*B*g^4*b^2/(a*d-b*c)*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*a^3*c^3-12/d^4*
B*g^4/(a*d-b*c)*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*a*c^5*b^4+30/d*B*g^4*b/(a*d
-b*c)*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*a^4*c^2+30/d^3*B*g^4*b^3/(a*d-b*c)*ln
(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*a^2*c^4+1/d*B*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c
+b)^2/d^2)*a^4*c*g^4+2/5/d^5*B*g^4*ln(1/(d*x+c))*c^5*b^4+8/5/d^5*B*g^4*b^4*
c^5*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)+1/5/d^5*B*g^4*b^4*ln(e*(a/(d*x+c)*d-1/(
d*x+c)*b*c+b)^2/d^2)*c^5-1/10/d*B*g^4*b^4*c*x^4+2/15/d^2*B*g^4*b^4*c^2*x^3-
1/5/d^3*B*g^4*b^4*c^3*x^2+2/5/d^4*B*g^4*b^4*c^4*x+2/d*B*g^4*ln(1/(d*x+c))*a
^4*c+2*B*g^4*b*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b)^2/d^2)*a^3*x^2+B*g^4*b^3*
ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b)^2/d^2)*a*x^4-12*B*g^4/(a*d-b*c)*ln(a/(d*
x+c)*d-1/(d*x+c)*b*c+b)*a^5*c+2*B*g^4*b^2*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b
)^2/d^2)*a^2*x^3+8/d*B*g^4*a^4*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*c-113/30/d^4
*B*g^4*b^3*a*c^4+98/15/d^3*B*g^4*b^2*a^2*c^3-26/5/d^2*B*g^4*b*a^3*c^2+2/d^3
*A*g^4*a^2*b^2*c^3-1/d^4*A*g^4*a*b^3*c^4-2/d^2*A*g^4*a^3*b*c^2+8/5*B*x*a^4*
g^4+1/5*A*g^4*x^5*b^4+A*g^4*x*a^4+5/6/d^5*B*g^4*b^4*c^5-16/d^2*B*g^4*b*a^3*
ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*c^2+2/d^3*B*g^4*ln(e*(a/(d*x+c)*d-1/(d*x+c)
*b*c+b)^2/d^2)*a^2*b^2*c^3-2/d^2*B*g^4*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b)^2
/d^2)*a^3*b*c^2-1/d^4*B*g^4*b^3*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b)^2/d^2)*a
*c^4+4/d^3*B*g^4*b^2*ln(1/(d*x+c))*a^2*c^3-8/d^4*B*g^4*b^3*c^4*ln(a/(d*x+c)
*d-1/(d*x+c)*b*c+b)*a-2/d^4*B*g^4*b^3*ln(1/(d*x+c))*a*c^4+16/d^3*B*g^4*b^2*
a^2*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*c^3-4/d^2*B*g^4*b*ln(1/(d*x+c))*a^3*c^2
+2/d^5*B*g^4/(a*d-b*c)*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*c^6*b^5+2*d*B*g^4/b/
(a*d-b*c)*ln(a/(d*x+c)*d-1/(d*x+c)*b*c+b)*a^6-2/d*B*g^4*b^2*a^2*x^2*c+4/d^2
*B*g^4*b^2*a^2*x*c^2-2/d^3*B*g^4*b^3*a*x*c^3-4/d*B*g^4*b*a^3*x*c-2/3/d*B*g^
4*b^3*a*x^3*c+1/d^2*B*g^4*b^3*a*x^2*c^2+1/5/d^5*A*g^4*b^4*c^5+1/d*A*g^4*a^4
*c+8/5/d*B*a^4*c*g^4+8/15*B*g^4*b^2*a^2*x^3+1/10*B*g^4*b^3*a*x^4+6/5*B*g^4*
b*a^3*x^2+2*A*g^4*x^3*a^2*b^2+A*g^4*x^4*a*b^3+2*A*g^4*x^2*a^3*b-2/5*B*g^4/b
*ln(1/(d*x+c))*a^5+1/5*B*g^4*b^4*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b)^2/d^2)*
x^5+B*ln(e*(a/(d*x+c)*d-1/(d*x+c)*b*c+b)^2/d^2)*x*a^4*g^4-8/5*B*g^4/b*a^5*l
n(a/(d*x+c)*d-1/(d*x+c)*b*c+b)
```

maxima [B] time = 1.44, size = 885, normalized size = 4.86

$$\frac{1}{5}\,Ab^{4}g^{4}x^{5}+Aab^{3}g^{4}x^{4}+2\,Aa^{2}b^{2}g^{4}x^{3}+2\,Aa^{3}bg^{4}x^{2}+\left(x\log\left(\frac{b^{2}ex^{2}}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{2\,abex}{d^{2}x^{2}+2\,cdx+c^{2}}+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*
d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*lo
g(d*x + c)/d)*B*a^4*g^4 + 2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) +
2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*
a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*a^
3*b*g^4 + 2*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x
^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)
/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2
*d^2)*x)/(b^2*d^2))*B*a^2*b^2*g^4 + 1/3*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c
*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*
x + c^2)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2
 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x
)/(b^3*d^3))*B*a*b^3*g^4 + 1/30*(6*x^5*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b
^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)
*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

mupad [B] time = 4.99, size = 1025, normalized size = 5.63

$$x^2 \left(\frac{(5\,a\,d+5\,b\,c) \left(\frac{\left(\frac{b^3\,g^4\,(25\,A\,a\,d+5\,A\,b\,c+2\,B\,a\,d-2\,B\,b\,c)}{5\,d} - \frac{A\,b^3\,g^4\,(5\,a\,d+5\,b\,c)}{5\,d} \right) (5\,a\,d+5\,b\,c)}{5\,b\,d} - \frac{a\,b^2\,g^4\,(10\,A\,a\,d+5\,A\,b\,c+2\,B\,a\,d-2\,B\,b\,c)}{d} + \frac{A\,a\,b^3\,c\,g^4}{d} \right.}{10\,b\,d} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] x^2*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))
/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b
^2*g^4*(10*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/d + (A*a*b^3*c*g^4)/d))/(1
0*b*d) + (a^2*b*g^4*(5*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/d - (a*c*((b^3
*g^4*(25*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d +
5*b*c))/(5*d)))/(2*b*d)) - x^3*((((b^3*g^4*(25*A*a*d + 5*A*b*c + 2*B*a*d -
2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(15*b
*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/(3*d) + (A*a*b^3
*c*g^4)/(3*d)) + x*((a^3*g^4*(5*A*a*d + 10*A*b*c + 4*B*a*d - 4*B*b*c))/d -
((5*a*d + 5*b*c)*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d + 5*A*b*c + 2*B*a*
d - 2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(
5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/d + (A*a*b^3*
c*g^4)/d))/(5*b*d) + (2*a^2*b*g^4*(5*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/
d - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/(5*d) - (A*b^3
*g^4*(5*a*d + 5*b*c))/(5*d)))/(b*d)))/(5*b*d) + (a*c*((((b^3*g^4*(25*A*a*d
+ 5*A*b*c + 2*B*a*d - 2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*
(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b
*c))/d + (A*a*b^3*c*g^4)/d))/(b*d)) + log((e*(a + b*x)^2)/(c + d*x)^2)*((B*
b^4*g^4*x^5)/5 + B*a^4*g^4*x + 2*B*a^3*b*g^4*x^2 + B*a*b^3*g^4*x^4 + 2*B*a^
2*b^2*g^4*x^3) + x^4*((b^3*g^4*(25*A*a*d + 5*A*b*c + 2*B*a*d - 2*B*b*c))/(2
0*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(20*d)) - (log(c + d*x)*(2*B*b^4*c^5*g^4
 + 10*B*a^4*c*d^4*g^4 - 20*B*a^3*b*c^2*d^3*g^4 + 20*B*a^2*b^2*c^3*d^2*g^4 -
```

```
 10*B*a*b^3*c^4*d*g^4))/(5*d^5) + (A*b^4*g^4*x^5)/5 + (2*B*a^5*g^4*log(a +
b*x))/(5*b)
```

sympy [**B**] time = 6.74, size = 998, normalized size = 5.48

$$\frac{Ab^4g^4x^5}{5}+\frac{2Ba^5g^4\log\left(x+\frac{\frac{2Ba^6d^5g^4}{b}+10Ba^5cd^4g^4-20Ba^4bc^2d^3g^4+20Ba^3b^2c^3d^2g^4-10Ba^2b^3c^4dg^4+2Bab^4c^5g^4}{2Ba^5d^5g^4+10Ba^4bcd^4g^4-20Ba^3b^2c^2d^3g^4+20Ba^2b^3c^3d^2g^4-10Bab^4c^4dg^4+2Bb^5c^5g^4}\right)}{5b}-\frac{2Bcg^4\,(5a^4d^4-1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b**4*g**4*x**5/5 + 2*B*a**5*g**4*log(x + (2*B*a**6*d**5*g**4/b + 10*B*a**
5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g**4 + 20*B*a**3*b**2*c**3*d**2*g**4
- 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b**4*c**5*g**4)/(2*B*a**5*d**5*g**4 +
10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g**4 + 20*B*a**2*b**3*c*
*3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**5*g**4))/(5*b) - 2*B*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4)*log(x + (12*B*a**5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g
**4 + 20*B*a**3*b**2*c**3*d**2*g**4 - 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b*
*4*c**5*g**4 - 2*B*a*c*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*
c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4) + 2*B*b*c**2*g**4*(5*a**4*d**4 - 1
0*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/
(2*B*a**5*d**5*g**4 + 10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g*
*4 + 20*B*a**2*b**3*c**3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**
5*g**4))/(5*d**5) + x**4*(A*a*b**3*g**4 + B*a*b**3*g**4/10 - B*b**4*c*g**4/
(10*d)) + x**3*(2*A*a**2*b**2*g**4 + 8*B*a**2*b**2*g**4/15 - 2*B*a*b**3*c*g
**4/(3*d) + 2*B*b**4*c**2*g**4/(15*d**2)) + x**2*(2*A*a**3*b*g**4 + 6*B*a**
3*b*g**4/5 - 2*B*a**2*b**2*c*g**4/d + B*a*b**3*c**2*g**4/d**2 - B*b**4*c**3
*g**4/(5*d**3)) + x*(A*a**4*g**4 + 8*B*a**4*g**4/5 - 4*B*a**3*b*c*g**4/d +
4*B*a**2*b**2*c**2*g**4/d**2 - 2*B*a*b**3*c**3*g**4/d**3 + 2*B*b**4*c**4*g*
*4/(5*d**4)) + (B*a**4*g**4*x + 2*B*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g**4*x
**3 + B*a*b**3*g**4*x**4 + B*b**4*g**4*x**5/5)*log(e*(a + b*x)**2/(c + d*x)
**2)
```

3.120 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=151

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4b}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}-\frac{Bg^3x(bc-ad)^3}{2d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}-Bg^3(a+$$

```
[Out] -1/2*B*(-a*d+b*c)^3*g^3*x/d^3+1/4*B*(-a*d+b*c)^2*g^3*(b*x+a)^2/b/d^2-1/6*B*
(-a*d+b*c)*g^3*(b*x+a)^3/b/d+1/4*g^3*(b*x+a)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^
2))/b+1/2*B*(-a*d+b*c)^4*g^3*ln(d*x+c)/b/d^4
```

Rubi [A] time = 0.10, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 43}

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4b}-\frac{Bg^3x(bc-ad)^3}{2d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}-Bg^3(a+$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -(B*(b*c - a*d)^3*g^3*x)/(2*d^3) + (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(4*b*d
^2) - (B*(b*c - a*d)*g^3*(a + b*x)^3)/(6*b*d) + (g^3*(a + b*x)^4*(A + B*Log
[(e*(a + b*x)^2)/(c + d*x)^2]))/(4*b) + (B*(b*c - a*d)^4*g^3*Log[c + d*x])/
(2*b*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx &= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4b}-\frac{B\int\frac{2(bc-ad)g^4(a+bx)^3}{c+dx}\,dx}{4bg}\\ &= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4b}-\frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3}{c+dx}\,dx}{2b}\\ &= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4b}-\frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2}{d^3}\right.}{}\\ &= -\frac{B(bc-ad)^3g^3x}{2d^3}+\frac{B(bc-ad)^2g^3(a+bx)^2}{4bd^2}-\frac{B(bc-ad)g^3(a+}{6bd}\end{aligned}$$

Mathematica [**A**] time = 0.09, size = 122, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{3d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - (B*(b*c - a*d)
*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x
)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/(3*d^4)))/(4*b)
```

fricas [**B**] time = 1.09, size = 341, normalized size = 2.26

$$\frac{3\,Ab^4d^4g^3x^4+6\,Ba^4d^4g^3\log(bx+a)-2\left(Bb^4cd^3-(6\,A+B)ab^3d^4\right)g^3x^3+3\left(Bb^4c^2d^2-4\,Bab^3cd^3+3\,(2\,A+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] 1/12*(3*A*b^4*d^4*g^3*x^4 + 6*B*a^4*d^4*g^3*log(b*x + a) - 2*(B*b^4*c*d^3 -
 (6*A + B)*a*b^3*d^4)*g^3*x^3 + 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + 3*(2*A
 + B)*a^2*b^2*d^4)*g^3*x^2 - 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*b
^2*c*d^3 - (2*A + 3*B)*a^3*b*d^4)*g^3*x + 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 3*(B*b^4*d^4*g^3*
x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*x
)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b*d^4)
```

giac [**B**] time = 17.61, size = 361, normalized size = 2.39

$$\frac{Ba^4g^3\log(bx+a)}{2\,b}+\frac{1}{4}\left(Ab^3g^3+Bb^3g^3\right)x^4-\frac{\left(Bb^3cg^3-6\,Aab^2dg^3-7\,Bab^2dg^3\right)x^3}{6\,d}+\frac{1}{4}\left(Bb^3g^3x^4+4\,Bab^2g^3x^3+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] 1/2*B*a^4*g^3*log(b*x + a)/b + 1/4*(A*b^3*g^3 + B*b^3*g^3)*x^4 - 1/6*(B*b^3
*c*g^3 - 6*A*a*b^2*d*g^3 - 7*B*a*b^2*d*g^3)*x^3/d + 1/4*(B*b^3*g^3*x^4 + 4*
B*a*b^2*g^3*x^3 + 6*B*a^2*b*g^3*x^2 + 4*B*a^3*g^3*x)*log((b^2*x^2 + 2*a*b*x
```

```
 + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) + 1/4*(B*b^3*c^2*g^3 - 4*B*a*b^2*c*d*g^3
 + 6*A*a^2*b*d^2*g^3 + 9*B*a^2*b*d^2*g^3)*x^2/d^2 - 1/2*(B*b^3*c^3*g^3 - 4*
B*a*b^2*c^2*d*g^3 + 6*B*a^2*b*c*d^2*g^3 - 2*A*a^3*d^3*g^3 - 5*B*a^3*d^3*g^3
)*x/d^3 + 1/2*(B*b^3*c^4*g^3 - 4*B*a*b^2*c^3*d*g^3 + 6*B*a^2*b*c^2*d^2*g^3
- 4*B*a^3*c*d^3*g^3)*log(d*x + c)/d^4
```

maple [B] time = 0.08, size = 1249, normalized size = 8.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] 1/4*A*g^3*x^4*b^3+3/2*B*x*a^3*g^3+A*g^3*x*a^3+3/2/d*B*a^3*c*g^3+1/d*A*g^3*a
^3*c-11/12/d^4*B*g^3*b^3*c^4-1/4/d^4*A*g^3*b^3*c^4+2/d*B*g^3*ln(1/(d*x+c))*
a^3*c-1/4/d^4*B*g^3*b^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c^4-1/6
/d*B*g^3*b^3*c*x^3-1/2/d^4*B*g^3*ln(1/(d*x+c))*c^4*b^3-3/2/d^4*B*g^3*b^3*c^
4*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)+6/d*B*g^3*a^3*ln(1/(d*x+c)*a*d-1/(d*x+c
)*b*c+b)*c+1/4/d^2*B*g^3*b^3*c^2*x^2-1/2/d^3*B*g^3*b^3*c^3*x-10*B*g^3/(a*d-
b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^4*c+B*g^3*b^2*ln((1/(d*x+c)*a*d-1/
(d*x+c)*b*c+b)^2/d^2*e)*a*x^3+3/2*B*g^3*b*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b
)^2/d^2*e)*a^2*x^2+1/d*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a^3*c*
g^3+19/6/d^3*B*g^3*b^2*a*c^3-3/2/d^2*A*g^3*a^2*b*c^2-15/4/d^2*B*g^3*b*a^2*c
^2+1/d^3*A*g^3*a*b^2*c^3+10/d^3*B*g^3/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*
b*c+b)*a*c^4*b^3+20/d*B*g^3*b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a
^3*c^2-20/d^2*B*g^3*b^2/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c^3
+3/4*B*g^3*b*a^2*x^2+1/6*B*g^3*b^2*a*x^3-3/2*B*g^3/b*a^4*ln(1/(d*x+c)*a*d-1
/(d*x+c)*b*c+b)+1/4*B*g^3*b^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x
^4-1/2*B*g^3/b*ln(1/(d*x+c))*a^4+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2
*e)*x*a^3*g^3+3/2*A*g^3*x^2*a^2*b+A*g^3*x^3*a*b^2+2*d*B*g^3/b/(a*d-b*c)*ln(
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^5+6/d^3*B*g^3*b^2*a*ln(1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)*c^3-2/d^4*B*g^3/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^5
*b^4-3/d^2*B*g^3*b*ln(1/(d*x+c))*a^2*c^2+1/d^3*B*g^3*ln((1/(d*x+c)*a*d-1/(d
*x+c)*b*c+b)^2/d^2*e)*a*b^2*c^3-3/2/d^2*B*g^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^2/d^2*e)*a^2*b*c^2-3/d*B*g^3*b*a^2*x*c-1/d*B*g^3*b^2*a*x^2*c+2/d^2*B*
g^3*b^2*a*x*c^2-9/d^2*B*g^3*b*a^2*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2+2/d
^3*B*g^3*b^2*ln(1/(d*x+c))*a*c^3
```

maxima [B] time = 1.60, size = 647, normalized size = 4.28

$$\frac{1}{4}\,Ab^{3}g^{3}x^{4}+Aab^{2}g^{3}x^{3}+\frac{3}{2}\,Aa^{2}bg^{3}x^{2}+\left(x\log\left(\frac{b^{2}ex^{2}}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{2\,abex}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+\frac{2\,a\,l}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(b^2*e*x^
2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(
d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*a^3*
g^3 + 3/2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2
 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b
^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + (x^3*log
(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2)
+ a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
 + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*
B*a*b^2*g^3 + 1/12*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e
*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
```

```
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^
3 + A*a^3*g^3*x
```

mupad [**B**] time = 4.74, size = 567, normalized size = 3.75

$$\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\left(B\,a^3\,g^3\,x+\frac{3\,B\,a^2\,b\,g^3\,x^2}{2}+B\,a\,b^2\,g^3\,x^3+\frac{B\,b^3\,g^3\,x^4}{4}\right)-x^2\left(\frac{\left(\frac{b^2\,g^3\,(8\,A\,a\,d+2\,A\,b\,c+B\,a\,d-B\,b\,c)}{2\,d}-\frac{A\,b^2\,g}{}\right.}{4\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] log((e*(a + b*x)^2)/(c + d*x)^2)*((B*b^3*g^3*x^4)/4 + B*a^3*g^3*x + (3*B*a^
2*b*g^3*x^2)/2 + B*a*b^2*g^3*x^3) - x^2*((((b^2*g^3*(8*A*a*d + 2*A*b*c + B*
a*d - B*b*c))/(2*d) - (A*b^2*g^3*(2*a*d + 2*b*c))/(2*d))*(2*a*d + 2*b*c))/(
4*b*d) - (a*b*g^3*(3*A*a*d + 2*A*b*c + B*a*d - B*b*c))/d + (A*a*b^2*c*g^3)/
(2*d)) + x*(((2*a*d + 2*b*c)*((((b^2*g^3*(8*A*a*d + 2*A*b*c + B*a*d - B*b*c
))/(2*d) - (A*b^2*g^3*(2*a*d + 2*b*c))/(2*d))*(2*a*d + 2*b*c))/(2*b*d) - (2
*a*b*g^3*(3*A*a*d + 2*A*b*c + B*a*d - B*b*c))/d + (A*a*b^2*c*g^3)/d))/(2*b*
d) + (a^2*g^3*(4*A*a*d + 6*A*b*c + 3*B*a*d - 3*B*b*c))/d - (a*c*((b^2*g^3*(
8*A*a*d + 2*A*b*c + B*a*d - B*b*c))/(2*d) - (A*b^2*g^3*(2*a*d + 2*b*c))/(2*
d)))/(b*d)) + x^3*((b^2*g^3*(8*A*a*d + 2*A*b*c + B*a*d - B*b*c))/(6*d) - (A
*b^2*g^3*(2*a*d + 2*b*c))/(6*d)) + (log(c + d*x)*(B*b^3*c^4*g^3 - 4*B*a^3*c
*d^3*g^3 + 6*B*a^2*b*c^2*d^2*g^3 - 4*B*a*b^2*c^3*d*g^3))/(2*d^4) + (A*b^3*g
^3*x^4)/4 + (B*a^4*g^3*log(a + b*x))/(2*b)
```

sympy [**B**] time = 4.89, size = 707, normalized size = 4.68

$$\frac{Ab^3g^3x^4}{4}+\frac{Ba^4g^3\log\left(x+\frac{\frac{Ba^5d^4g^3}{b}+4Ba^4cd^3g^3-6Ba^3bc^2d^2g^3+4Ba^2b^2c^3dg^3-Bab^3c^4g^3}{Ba^4d^4g^3+4Ba^3bcd^3g^3-6Ba^2b^2c^2d^2g^3+4Bab^3c^3dg^3-Bb^4c^4g^3}\right)}{2b}-\frac{Bcg^3\,(2ad-bc)\left(2a^2d^2-2abcd+b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b**3*g**3*x**4/4 + B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*b) - B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*d**4) + x**3*(A*a*b**2*g**3 + B*a
*b**2*g**3/6 - B*b**3*c*g**3/(6*d)) + x**2*(3*A*a**2*b*g**3/2 + 3*B*a**2*b*
g**3/4 - B*a*b**2*c*g**3/d + B*b**3*c**2*g**3/(4*d**2)) + x*(A*a**3*g**3 +
3*B*a**3*g**3/2 - 3*B*a**2*b*c*g**3/d + 2*B*a*b**2*c**2*g**3/d**2 - B*b**3*
c**3*g**3/(2*d**3)) + (B*a**3*g**3*x + 3*B*a**2*b*g**3*x**2/2 + B*a*b**2*g*
*3*x**3 + B*b**3*g**3*x**4/4)*log(e*(a + b*x)**2/(c + d*x)**2)
```

3.121 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx$

Optimal. Leaf size=120

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3b}-\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{2Bg^2x(bc-ad)^2}{3d^2}-\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

```
[Out] 2/3*B*(-a*d+b*c)^2*g^2*x/d^2-1/3*B*(-a*d+b*c)*g^2*(b*x+a)^2/b/d+1/3*g^2*(b*
x+a)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b-2/3*B*(-a*d+b*c)^3*g^2*ln(d*x+c)/b
/d^3
```

Rubi **[A]** time = 0.07, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 43}

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3b}+\frac{2Bg^2x(bc-ad)^2}{3d^2}-\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (2*B*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B*(b*c - a*d)*g^2*(a + b*x)^2)/(3*b*d)
 + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b) - (2*B*
(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b} - \frac{B\int\frac{2(bc-ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\frac{(a+bx)^2}{c+dx}\,d}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\Big(-\frac{b(bc-a}{d^2}}{3}$$

$$= \frac{2B(bc-ad)^2g^2x}{3d^2} - \frac{B(bc-ad)g^2(a+bx)^2}{3bd} + \frac{g^2(a+bx)^3\Big(A+B}{3b}$$

Mathematica [**A**] time = 0.06, size = 98, normalized size = 0.82

$$\frac{g^2\left(\frac{B(ad-bc)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{d^3}+(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(-(b*c) + a
*d)*(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c - a*d)^2*Log[c + d
*x]))/d^3))/(3*b)
```

fricas [**B**] time = 0.75, size = 243, normalized size = 2.02

$$Ab^3d^3g^2x^3 + 2\,Ba^3d^3g^2\log(bx+a) - \left(Bb^3cd^2 - (3\,A+B)ab^2d^3\right)g^2x^2 + \Big(2\,Bb^3c^2d - 6\,Bab^2cd^2 + (3\,A+4\,B)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] 1/3*(A*b^3*d^3*g^2*x^3 + 2*B*a^3*d^3*g^2*log(b*x + a) - (B*b^3*c*d^2 - (3*A
 + B)*a*b^2*d^3)*g^2*x^2 + (2*B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + (3*A + 4*B)*a
^2*b*d^3)*g^2*x - 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*log
(d*x + c) + (B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*g^2*
x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b*d^3)
```

giac [**B**] time = 3.43, size = 252, normalized size = 2.10

$$\frac{2\,Ba^3g^2\log(bx+a)}{3\,b}+\frac{1}{3}\left(Ab^2g^2+Bb^2g^2\right)x^3-\frac{\left(Bb^2cg^2-3\,Aabdg^2-4\,Babdg^2\right)x^2}{3\,d}+\frac{1}{3}\Big(Bb^2g^2x^3+3\,Babg^2x^2+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] 2/3*B*a^3*g^2*log(b*x + a)/b + 1/3*(A*b^2*g^2 + B*b^2*g^2)*x^3 - 1/3*(B*b^2
*c*g^2 - 3*A*a*b*d*g^2 - 4*B*a*b*d*g^2)*x^2/d + 1/3*(B*b^2*g^2*x^3 + 3*B*a*
b*g^2*x^2 + 3*B*a^2*g^2*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x
 + c^2)) + 1/3*(2*B*b^2*c^2*g^2 - 6*B*a*b*c*d*g^2 + 3*A*a^2*d^2*g^2 + 7*B*a
```

```
^2*d^2*g^2)*x/d^2 - 2/3*(B*b^2*c^3*g^2 - 3*B*a*b*c^2*d*g^2 + 3*B*a^2*c*d^2*
g^2)*log(-d*x - c)/d^3
```

maple [B] time = 0.08, size = 915, normalized size = 7.62

$$\frac{B b^2 g^2 x^3 \ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2 e}{d^2}\right)}{3}+\frac{A b^2 g^2 x^3}{3}+\frac{2B a^4 d g^2 \ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{(ad-bc)\,b}-\frac{8B a^3 c g^2 \ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{ad-bc}+ 12B a^2 b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] 1/3*B*g^2*b*a*x^2+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x*a^2*g^2+1
/d*A*g^2*a^2*c+1/3/d^3*A*g^2*b^2*c^3+1/d^3*B*g^2*c^3*b^2+4/3/d*B*g^2*a^2*c-
4/3*B*g^2/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^3-2/3*B*g^2/b*ln(1/(d*x+c))
*a^3+1/3*B*g^2*b^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x^3+A*g^2*x^
2*a*b+4/3*B*x*a^2*g^2+A*g^2*x*a^2+1/3*A*g^2*x^3*b^2-1/d^2*B*g^2*ln((1/(d*x+
c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a*b*c^2-2/d*B*g^2*a*b*c*x+2*d*B*g^2/b/(a*d
-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^4-2/d^2*B*g^2*b*ln(1/(d*x+c))*a*c
^2-4/d^2*B*g^2*b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^2+4/d*B*g^2*ln(1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c+2/d*B*g^2*ln(1/(d*x+c))*a^2*c+1/d*B*ln((1/(
d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a^2*c*g^2+4/3/d^3*B*g^2*ln(1/(d*x+c)*a
*d-1/(d*x+c)*b*c+b)*c^3*b^2-1/d^2*A*g^2*a*b*c^2-8/d^2*B*g^2/(a*d-b*c)*ln(1/
(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^3*b^2-7/3/d^2*B*g^2*b*a*c^2+12/d*B*g^2*b/(
a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c^2+2/3/d^3*B*g^2*ln(1/(d*x+
c))*c^3*b^2+1/3/d^3*B*g^2*b^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c
^3-8*B*g^2/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^3*c+B*g^2*b*ln((1/
(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a*x^2+2/3/d^2*B*g^2*c^2*b^2*x-1/3/d*B
*g^2*b^2*c*x^2+2/d^3*B*g^2/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^4*
b^3
```

maxima [B] time = 1.41, size = 437, normalized size = 3.64

$$\frac{1}{3}Ab^2g^2x^3+Aabg^2x^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2cdx+c^2}+\frac{2abex}{d^2x^2+2cdx+c^2}+\frac{a^2e}{d^2x^2+2cdx+c^2}\right)+\frac{2a\log(bx+a)}{b}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(b^2*e*x^2
/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d
^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2
 - 2*(b*c - a*d)*x/(b*d))*B*a*b*g^2 + 1/3*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*
d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
 + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

mupad [B] time = 4.59, size = 296, normalized size = 2.47

$$x^2\left(\frac{b\,g^2\,\left(9\,A\,a\,d+3\,A\,b\,c+2\,B\,a\,d-2\,B\,b\,c\right)}{6\,d}-\frac{A\,b\,g^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,d}\right)-x\left(\frac{\left(3\,a\,d+3\,b\,c\right)\left(\frac{b\,g^2\,(9\,A\,a\,d+3\,A\,b\,c+2\,B\,a\,d-2}{3\,d}\right.}{3\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] x^2*((b*g^2*(9*A*a*d + 3*A*b*c + 2*B*a*d - 2*B*b*c))/(6*d) - (A*b*g^2*(3*a*
d + 3*b*c))/(6*d)) - x*(((3*a*d + 3*b*c)*((b*g^2*(9*A*a*d + 3*A*b*c + 2*B*a
*d - 2*B*b*c))/(3*d) - (A*b*g^2*(3*a*d + 3*b*c))/(3*d)))/(3*b*d) - (a*g^2*(
3*A*a*d + 3*A*b*c + 2*B*a*d - 2*B*b*c))/d + (A*a*b*c*g^2)/d) + log((e*(a +
b*x)^2)/(c + d*x)^2)*((B*b^2*g^2*x^3)/3 + B*a^2*g^2*x + B*a*b*g^2*x^2) - (l
og(c + d*x)*(2*B*b^2*c^3*g^2 + 6*B*a^2*c*d^2*g^2 - 6*B*a*b*c^2*d*g^2))/(3*d
^3) + (A*b^2*g^2*x^3)/3 + (2*B*a^3*g^2*log(a + b*x))/(3*b)
```

sympy **[B]** time = 3.51, size = 517, normalized size = 4.31

$$\frac{Ab^2g^2x^3}{3} + \frac{2Ba^3g^2\log\left(x + \frac{\frac{2Ba^4d^3g^2}{b} + 6Ba^3cd^2g^2 - 6Ba^2bc^2dg^2 + 2Bab^2c^3g^2}{2Ba^3d^3g^2 + 6Ba^2bcd^2g^2 - 6Bab^2c^2dg^2 + 2Bb^3c^3g^2}\right)}{3b} - \frac{2Bcg^2\left(3a^2d^2 - 3abcd + b^2c^2\right)\log\left(x + \frac{8Ba^3c}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b**2*g**2*x**3/3 + 2*B*a**3*g**2*log(x + (2*B*a**4*d**3*g**2/b + 6*B*a**3
*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2)/(2*B*a**3*d**
3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g*
*2))/(3*b) - 2*B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (8*B*
a**3*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2 - 2*B*a*c*
g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2) + 2*B*b*c**2*g**2*(3*a**2*d**2 -
 3*a*b*c*d + b**2*c**2)/d)/(2*B*a**3*d**3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6
*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g**2))/(3*d**3) + x**2*(A*a*b*g**2 +
B*a*b*g**2/3 - B*b**2*c*g**2/(3*d)) + x*(A*a**2*g**2 + 4*B*a**2*g**2/3 - 2*
B*a*b*c*g**2/d + 2*B*b**2*c**2*g**2/(3*d**2)) + (B*a**2*g**2*x + B*a*b*g**2
*x**2 + B*b**2*g**2*x**3/3)*log(e*(a + b*x)**2/(c + d*x)**2)
```

3.122 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=78

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}-\frac{Bgx(bc-ad)}{d}$$

```
[Out] -B*(-a*d+b*c)*g*x/d+1/2*g*(b*x+a)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b+B*(-a
*d+b*c)^2*g*ln(d*x+c)/b/d^2
```

Rubi [A] time = 0.06, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}-\frac{Bgx(bc-ad)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -((B*(b*c - a*d)*g*x)/d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(2*b) + (B*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} - \frac{B\int \frac{2(bc-ad)g^2(a+bx)}{c+dx}\,dx}{2bg} \\
&= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int \frac{a+bx}{c+dx}\,dx}{b} \\
&= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int \left(\frac{b}{d}+\frac{-bc+ad}{d(c+dx)}\right)}{b} \\
&= -\frac{B(bc-ad)gx}{d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} + \frac{B(bc-ad)^2}{}
\end{aligned}
$$

Mathematica [**A**] time = 0.05, size = 72, normalized size = 0.92

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{2B(ad-bc)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (2*B*(-(b*c) + a
*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2))/(2*b)
```

fricas [**A**] time = 0.58, size = 148, normalized size = 1.90

$$\frac{Ab^2d^2gx^2 + 2\,Ba^2d^2g\log(bx+a) - 2\left(Bb^2cd-(A+B)abd^2\right)gx + 2\left(Bb^2c^2-2\,Babcd\right)g\log(dx+c) + \left(Bb^2d^2\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + 2*B*a^2*d^2*g*log(b*x + a) - 2*(B*b^2*c*d - (A + B)*
a*b*d^2)*g*x + 2*(B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^
2 + 2*B*a*b*d^2*g*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
 + c^2)))/(b*d^2)
```

giac [**A**] time = 0.84, size = 131, normalized size = 1.68

$$\frac{Ba^2g\log(bx+a)}{b}+\frac{1}{2}\left(Abg+Bbg\right)x^2+\frac{1}{2}\left(Bbgx^2+2\,Bagx\right)\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right)-\frac{\left(Bbcg-Aadg-2\,Badg\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] B*a^2*g*log(b*x + a)/b + 1/2*(A*b*g + B*b*g)*x^2 + 1/2*(B*b*g*x^2 + 2*B*a*g
*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) - (B*b*c*g - A
*a*d*g - 2*B*a*d*g)*x/d + (B*b*c^2*g - 2*B*a*c*d*g)*log(d*x + c)/d^2
```

maple [**B**] time = 0.07, size = 560, normalized size = 7.18

$$\frac{2B\,a^3dg\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{(ad-bc)\,b}-\frac{6B\,a^2cg\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{ad-bc}+\frac{6Bab\,c^2g\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{(ad-bc)\,d}-\frac{2B\,b^2c^3g\ln\left(\frac{ad}{dx+c}\right.}{(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] -1/d*g*B*b*c*x+1/d*B*g*a*c+1/d*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e
)*a*c*g+1/d*A*g*a*c-1/2/d^2*A*g*b*c^2+1/2*A*g*x^2*b+2/d*B*g*ln(1/(d*x+c))*a
*c+2/d*B*g*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c-B*g/b*ln(1/(d*x+c))*a^2+g*
B*a*x+g*A*a*x-1/d^2*B*g*c^2*b-1/d^2*B*g*ln(1/(d*x+c))*c^2*b-B*g/b*ln(1/(d*x
+c)*a*d-1/(d*x+c)*b*c+b)*a^2-1/d^2*B*g*b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*
c^2-2/d^2*B*g/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*b^2+2*d*B*g/b
/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^3+6/d*B*g/(a*d-b*c)*ln(1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^2*b-1/2/d^2*B*g*ln((1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^2/d^2*e)*b*c^2+1/2*B*g*b*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*
x^2+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x*a*g-6*B*g/(a*d-b*c)*ln(
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c
```

maxima [B] time = 1.32, size = 250, normalized size = 3.21

$$\frac{1}{2}\,Abgx^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)+\frac{2\,a\log\left(bx+a\right)}{b}-\frac{2\,c\log\left(dx+\right.}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2
*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)
/b - 2*c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x
+ c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c
^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b
*d))*B*b*g + A*a*g*x
```

mupad [B] time = 4.39, size = 120, normalized size = 1.54

$$x\,\left(\frac{g\,\left(2\,A\,a\,d+A\,b\,c+B\,a\,d-B\,b\,c\right)}{d}-\frac{A\,g\,\left(a\,d+b\,c\right)}{d}\right)+\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\,\left(\frac{B\,b\,g\,x^2}{2}+B\,a\,g\,x\right)+\frac{A\,b\,g\,x^2}{2}+\frac{B\,a^2\,g\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] x*((g*(2*A*a*d + A*b*c + B*a*d - B*b*c))/d - (A*g*(a*d + b*c))/d) + log((e*
(a + b*x)^2)/(c + d*x)^2)*((B*b*g*x^2)/2 + B*a*g*x) + (A*b*g*x^2)/2 + (B*a^
2*g*log(a + b*x))/b - (B*c*g*log(c + d*x)*(2*a*d - b*c))/d^2
```

sympy [B] time = 2.02, size = 250, normalized size = 3.21

$$\frac{Abgx^2}{2}+\frac{Ba^2g\log\left(x+\frac{\frac{Ba^3d^2g}{b}+2Ba^2cdg-Babc^2g}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{b}-\frac{Bcg\left(2ad-bc\right)\log\left(x+\frac{3Ba^2cdg-Babc^2g-Bacg(2ad-bc)+\frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{d^2}+x\left(A\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b*g*x**2/2 + B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/b - B*c*g*(2*a*d -
b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B*b*c
**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/d**
2 + x*(A*a*g + B*a*g - B*b*c*g/d) + (B*a*g*x + B*b*g*x**2/2)*log(e*(a + b*x
)**2/(c + d*x)**2)
```

3.123 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=83

$$\frac{2B\text{Li}_2\left(\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/g+2*B*polylog(2,
1+(-a*d+b*c)/d/(b*x+a))/b/g
```

Rubi [A] time = 0.29, antiderivative size = 122, normalized size of antiderivative = 1.47, number of steps used = 10, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg}+\frac{2B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}-\frac{B\log^2(g(a+}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x),x]
```

```
[Out] -((B*Log[g*(a + b*x)]^2)/(b*g)) + ((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
*Log[a*g + b*g*x])/(b*g) + (2*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*
g*x])/(b*g) + (2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int\frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(ag+bgx)}{e(a+bx)^2}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int\frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(ag+bgx)}{(a+bx)^2}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int\left(\frac{2be\log(ag+bgx)}{a+bx}-\frac{2de\log(ag+bgx)}{c+dx}\right)dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{(2B)\int\frac{\log(ag+bgx)}{a+bx}\,dx}{g} + \frac{(2Bd)\int\frac{\log(ag+bgx)}{c+dx}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - (2B)\int$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - (2B)\,\text{Subst}$$

$$= -\frac{B\log^2(g(a+bx))}{bg} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a}{bg}$$

Mathematica [A] time = 0.05, size = 88, normalized size = 1.06

$$\frac{\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+2B\log\left(\frac{b(c+dx)}{bc-ad}\right)-B\log(a+bx)+A\right)+2B\,\text{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)}{bg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x),x]
```

```
[Out] (Log[a + b*x]*(A - B*Log[a + b*x] + B*Log[(e*(a + b*x)^2)/(c + d*x)^2] + 2*
B*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*B*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)])/(b*g)
```

fricas [F] time = 2.74, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x, algorithm="fricas
")
```

```
[Out] integral((B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A)/(b*g*x + a*g), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)/(b*g*x + a*g), x)
```

maple [B] time = 0.13, size = 552, normalized size = 6.65

$$\frac{2Bad\ln\left(\frac{1}{dx+c}\right)\ln\left(\frac{b+\frac{ad-bc}{dx+c}}{b}\right)}{(ad-bc)\,bg}+\frac{Bad\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2e}{d^2}\right)\ln\left(b+\frac{ad-bc}{dx+c}\right)}{(ad-bc)\,bg}-\frac{Bad\ln\left(b+\frac{ad-bc}{dx+c}\right)^2}{(ad-bc)\,bg}-\frac{2Bc\ln\left(\frac{1}{dx+c}\right)\ln\left(b+\right.}{(ad-bc)\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x)
```

```
[Out] d/g*A/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a-1/g*A/(a*d-b*c)*ln(1/
(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c-1/g*A/b*ln(1/(d*x+c))+d/g*B/b*ln(1/(d*x+c)*(
a*d-b*c)+b)/(a*d-b*c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a-1/g*B*l
n(1/(d*x+c)*(a*d-b*c)+b)/(a*d-b*c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2
*e)*c-d/g*B/b/(a*d-b*c)*ln(1/(d*x+c)*(a*d-b*c)+b)^2*a+1/g*B/(a*d-b*c)*ln(1/
(d*x+c)*(a*d-b*c)+b)^2*c-1/g*B/b*ln(1/(d*x+c))*ln((1/(d*x+c)*a*d-1/(d*x+c)*
b*c+b)^2/d^2*e)+2*d/g*B/b*dilog((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*a-2/g*
B*dilog((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*c+2*d/g*B/b*ln(1/(d*x+c))*ln((
1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*a-2/g*B*ln(1/(d*x+c))*ln((1/(d*x+c)*(a*
d-b*c)+b)/b)/(a*d-b*c)*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-B\left(\frac{2\,\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int\frac{bdx\log(e)+bc\log(e)+2\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^2dgx^2+abcg+\left(b^2cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx\right.}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x, algorithm="maxima
")
```

```
[Out] -B*(2*log(b*x + a)*log(d*x + c)/(b*g) - integrate((b*d*x*log(e) + b*c*log(e
) + 2*(2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g
 + a*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(a*g + b*g*x), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A}{a+bx}\, dx + \int \frac{B\log\left(\frac{a^{2}e}{c^{2}+2cdx+d^{2}x^{2}}+\frac{2abex}{c^{2}+2cdx+d^{2}x^{2}}+\frac{b^{2}ex^{2}}{c^{2}+2cdx+d^{2}x^{2}}\right)}{a+bx}\, dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g),x)
```

```
[Out] (Integral(A/(a + b*x), x) + Integral(B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x*
*2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x
+ d**2*x**2))/(a + b*x), x))/g
```

3.124 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=65

$$-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{2B}{bg^2(a+bx)}$$

```
[Out] -2*B/b/g^2/(b*x+a)-(d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)/g^2/(
b*x+a)
```

Rubi [A] time = 0.08, antiderivative size = 105, normalized size of antiderivative = 1.62, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{bg^2(a+bx)}-\frac{2Bd\log(a+bx)}{bg^2(bc-ad)}+\frac{2Bd\log(c+dx)}{bg^2(bc-ad)}-\frac{2B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] (-2*B)/(b*g^2*(a + b*x)) - (2*B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b*g^2*(a + b*x)) + (2*B*d*Log[c + d*x]
)/(b*(b*c - a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{B\int\frac{2(bc-ad)}{g(a+bx)^2(c+dx)}\,dx}{bg}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{(2B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2}-\frac{bd}{(bc-ad)^2(a+bx)}+\frac{d^2}{(bc-ad)^2(c+dx)}\right.}{bg^2}\\ &= -\frac{2B}{bg^2(a+bx)}-\frac{2Bd\log(a+bx)}{b(bc-ad)g^2}-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{2Bd\log(c+dx)}{b(bc-ad)g^2}\end{aligned}$$

Mathematica [A] time = 0.06, size = 111, normalized size = 1.71

$$\frac{2B(bc-ad)\left(-\frac{1}{(a+bx)(bc-ad)}-\frac{d\log(a+bx)}{(bc-ad)^2}+\frac{d\log(c+dx)}{(bc-ad)^2}\right)}{bg^2}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b*g^2*(a + b*x))) + (2*B*(b*c -
 a*d)*(-(1/((b*c - a*d)*(a + b*x))) - (d*Log[a + b*x])/(b*c - a*d)^2 + (d*L
og[c + d*x])/(b*c - a*d)^2))/(b*g^2)
```

fricas [A] time = 0.68, size = 110, normalized size = 1.69

$$-\frac{(A+2\,B)bc-(A+2\,B)ad+(Bbdx+Bbc)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x, algorithm="fric
as")
```

```
[Out] -((A + 2*B)*b*c - (A + 2*B)*a*d + (B*b*d*x + B*b*c)*log((b^2*e*x^2 + 2*a*b*
e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*
c - a^2*b*d)*g^2)
```

giac [B] time = 0.45, size = 188, normalized size = 2.89

$$\left(2\left(b^2cg^2-abdg^2\right)\left(\frac{d\log\left(\left|\frac{bcg}{bgx+ag}-\frac{adg}{bgx+ag}+d\right|\right)}{b^4c^2g^4-2\,ab^3cdg^4+a^2b^2d^2g^4}-\frac{1}{\left(b^2cg^2-abdg^2\right)\left(bgx+ag\right)bg}\right)-\frac{\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)}{\left(bgx+ag\right)bg}\right)B-\frac{A}{(bgx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x, algorithm="giac
")
```

```
[Out] (2*(b^2*c*g^2 - a*b*d*g^2)*(d*log(abs(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x +
a*g) + d))/(b^4*c^2*g^4 - 2*a*b^3*c*d*g^4 + a^2*b^2*d^2*g^4) - 1/((b^2*c*g^
2 - a*b*d*g^2)*(b*g*x + a*g)*b*g)) - log((b*x + a)^2*e/(d*x + c)^2)/((b*g*x
 + a*g)*b*g))*B - A/((b*g*x + a*g)*b*g)
```

maple [**B**] time = 0.08, size = 157, normalized size = 2.42

$$\frac{Bd\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}e}{d^{2}}\right)}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)(ad-bc)\,g^{2}}+\frac{Ad}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)(ad-bc)\,g^{2}}-\frac{2Bd}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)(dx+c)\,b\,g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x)
```

```
[Out] d/g^2*A/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)/(a*d-b*c)-2*d/g^2/(1/(d*x+c)*a*d-1/
(d*x+c)*b*c+b)*B/b/(d*x+c)+d/g^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*B/(a*d-b*c
)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)
```

maxima [**B**] time = 1.22, size = 187, normalized size = 2.88

$$-B\left(\frac{\log\left(\frac{b^{2}ex^{2}}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{2\,abex}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)}{b^{2}g^{2}x+abg^{2}}+\frac{2}{b^{2}g^{2}x+abg^{2}}+\frac{2\,d\log\left(bx+a\right)}{\left(b^{2}c-abd\right)g^{2}}-\frac{2\,d\log\left(dx+c\right)}{\left(b^{2}c-abd\right)g^{2}}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x, algorithm="maxi
ma")
```

```
[Out] -B*(log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x
+ c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^2*g^2*x + a*b*g^2) + 2/(b^2*g^
2*x + a*b*g^2) + 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - 2*d*log(d*x + c)/
((b^2*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

mupad [**B**] time = 5.25, size = 108, normalized size = 1.66

$$-\frac{A+2\,B}{x\,b^{2}\,g^{2}+a\,b\,g^{2}}-\frac{B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^{2}}{{\left(c+d\,x\right)}^{2}}\right)}{b^{2}\,g^{2}\,\left(x+\frac{a}{b}\right)}-\frac{B\,d\,\mathrm{atan}\left(\frac{b\,c\,2{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}+1{}\mathrm{i}\right)\,4{}\mathrm{i}}{b\,g^{2}\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(a*g + b*g*x)^2,x)
```

```
[Out] - (A + 2*B)/(b^2*g^2*x + a*b*g^2) - (B*log((e*(a + b*x)^2)/(c + d*x)^2))/(b
^2*g^2*(x + a/b)) - (B*d*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*4i)/(b*
g^2*(a*d - b*c))
```

sympy [**B**] time = 1.72, size = 255, normalized size = 3.92

$$-\frac{B\log\left(\frac{e(a+bx)^{2}}{(c+dx)^{2}}\right)}{abg^{2}+b^{2}g^{2}x}-\frac{2Bd\log\left(x+\frac{-\frac{2Ba^{2}d^{3}}{ad-bc}+\frac{4Babcd^{2}}{ad-bc}+2Bad^{2}-\frac{2Bb^{2}c^{2}d}{ad-bc}+2Bbcd}{4Bbd^{2}}\right)}{bg^{2}\left(ad-bc\right)}+\frac{2Bd\log\left(x+\frac{\frac{2Ba^{2}d^{3}}{ad-bc}-\frac{4Babcd^{2}}{ad-bc}+2Bad^{2}+\frac{2Bb^{2}c^{2}d}{ad-bc}+2B}{4Bbd^{2}}\right.}{bg^{2}\left(ad-bc\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(a*b*g**2 + b**2*g**2*x) - 2*B*d*log(x
+ (-2*B*a**2*d**3/(a*d - b*c) + 4*B*a*b*c*d**2/(a*d - b*c) + 2*B*a*d**2 - 2
*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*(a*d - b*c))
+ 2*B*d*log(x + (2*B*a**2*d**3/(a*d - b*c) - 4*B*a*b*c*d**2/(a*d - b*c) + 2
*B*a*d**2 + 2*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*
(a*d - b*c)) + (-A - 2*B)/(a*b*g**2 + b**2*g**2*x)
```

3.125 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=138

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}+\frac{Bd}{bg^3(a+bx)(bc-ad)}-\frac{B}{2bg^3(a+bx)^2}$$

```
[Out] -1/2*B/b/g^3/(b*x+a)^2+B*d/b/(-a*d+b*c)/g^3/(b*x+a)+B*d^2*ln(b*x+a)/b/(-a*d
+b*c)^2/g^3+1/2*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/g^3/(b*x+a)^2-B*d^2*ln(d
*x+c)/b/(-a*d+b*c)^2/g^3
```

Rubi **[A]** time = 0.09, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}+\frac{Bd}{bg^3(a+bx)(bc-ad)}-\frac{B}{2bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] -B/(2*b*g^3*(a + b*x)^2) + (B*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (B*d^2*Log
[a + b*x])/(b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
/(2*b*g^3*(a + b*x)^2) - (B*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^3}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{2(bc-ad)}{g^2(a+bx)^3(c+dx)}\,dx}{2bg} \\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{bg^3} \\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+b}\right.}{bg^3} \\
&= -\frac{B}{2bg^3(a+bx)^2}+\frac{Bd}{b(bc-ad)g^3(a+bx)}+\frac{Bd^2\log(a+bx)}{b(bc-ad)^2g^3}-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.}{2bg^3(a+bx)^2}
\end{aligned}
$$

Mathematica [**A**] time = 0.14, size = 109, normalized size = 0.79

$$
-\frac{\frac{B\left(2d^2(a+bx)^2\log(c+dx)+(bc-ad)(b(c-2dx)-3ad)-2d^2(a+bx)^2\log(a+bx)\right)}{(bc-ad)^2}+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2bg^3(a+bx)^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] -1/2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2] + (B*((b*c - a*d)*(-3*a*d + b*
(c - 2*d*x)) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d
*x]))/(b*c - a*d)^2)/(b*g^3*(a + b*x)^2)
```

fricas [**A**] time = 0.61, size = 238, normalized size = 1.72

$$
-\frac{(A+B)b^2c^2-2\,(A+2\,B)abcd+(A+3\,B)a^2d^2-2\left(Bb^2cd-Babd^2\right)x-\left(Bb^2d^2x^2+2\,Babd^2x-Bb^2c^2+2\,Ba\right.}{2\left(\left(b^5c^2-2\,ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2\,a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2\,a^3b^2cd+\right.\right.}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x, algorithm="fric
as")
```

```
[Out] -1/2*((A + B)*b^2*c^2 - 2*(A + 2*B)*a*b*c*d + (A + 3*B)*a^2*d^2 - 2*(B*b^2*
c*d - B*a*b*d^2)*x - (B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a*b*c
*d)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^5*c
^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^
3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [**A**] time = 0.30, size = 264, normalized size = 1.91

$$
\frac{Bd^2\log\left(bx+a\right)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}-\frac{Bd^2\log\left(dx+c\right)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}-\frac{B\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}+\frac{}{2\left(b^4cg^3x^2-a\right.}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x, algorithm="giac
")
```

```
[Out] B*d^2*log(b*x + a)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - B*d^2*
log(d*x + c)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/2*B*log((b
^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*g^3*x^2 + 2*a*b^2*g
```

```
^3*x + a^2*b*g^3) + 1/2*(2*B*b*d*x - A*b*c - 2*B*b*c + A*a*d + 4*B*a*d)/(b^
4*c*g^3*x^2 - a*b^3*d*g^3*x^2 + 2*a*b^3*c*g^3*x - 2*a^2*b^2*d*g^3*x + a^2*b
^2*c*g^3 - a^3*b*d*g^3)
```

maple [B] time = 0.12, size = 355, normalized size = 2.57

$$\frac{Bb\,d^{2}\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}e}{d^{2}}\right)}{2\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}\left(a^{2}d^{2}-2abcd+b^{2}c^{2}\right)g^{3}}-\frac{Ab\,d^{2}}{2\left(ad-bc\right)^{2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}g^{3}}+\frac{B\,d^{2}\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}e}{d^{2}}\right.}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}\left(ad-bc\right)(d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x)
```

```
[Out] d^2/g^3*A/(a*d-b*c)^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-1/2*d^2/g^3*A*b/(a*d-
b*c)^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2-d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^2*B/(a*d-b*c)/(d*x+c)-3/2*d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*B
/b/(d*x+c)^2+1/2*d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*b*B/(a^2*d^2-2*a
*b*c*d+b^2*c^2)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+d^2/g^3/(1/(d*x
+c)*a*d-1/(d*x+c)*b*c+b)^2*B/(a*d-b*c)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*
b*c+b)^2/d^2*e)
```

maxima [B] time = 1.24, size = 307, normalized size = 2.22

$$\frac{1}{2}\,B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^{4}c-ab^{3}d\right)g^{3}x^{2}+2\left(ab^{3}c-a^{2}b^{2}d\right)g^{3}x+\left(a^{2}b^{2}c-a^{3}bd\right)g^{3}}-\frac{\log\left(\frac{b^{2}ex^{2}}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{2\,abex}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right.}{b^{3}g^{3}x^{2}+2\,ab^{2}g^{3}x+a^{2}bg^{3}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - log(b^2*e*x^2/(d^2*x^2 + 2*c*
d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
 + c^2))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b
^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a
*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^
3)
```

mupad [B] time = 5.14, size = 206, normalized size = 1.49

$$-\frac{\frac{A\,a\,d-A\,b\,c+3\,B\,a\,d-B\,b\,c}{2\,\left(a\,d-b\,c\right)}+\frac{B\,b\,d\,x}{a\,d-b\,c}}{a^2\,b\,g^3+2\,a\,b^2\,g^3\,x+b^3\,g^3\,x^2}-\frac{B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)}{2\,b^2\,g^3\,\left(2\,a\,x+b\,x^2+\frac{a^2}{b}\right)}-\frac{2\,B\,d^2\,\mathrm{atanh}\left(\frac{b^3\,c^2\,g^3-a^2\,b\,d^2\,g^3}{b\,g^3\,{\left(a\,d-b\,c\right)}^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{b\,g^3\,{\left(a\,d-b\,c\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(a*g + b*g*x)^3,x)
```

```
[Out] - ((A*a*d - A*b*c + 3*B*a*d - B*b*c)/(2*(a*d - b*c)) + (B*b*d*x)/(a*d - b*c
))/(a^2*b*g^3 + b^3*g^3*x^2 + 2*a*b^2*g^3*x) - (B*log((e*(a + b*x)^2)/(c +
d*x)^2))/(2*b^2*g^3*(2*a*x + b*x^2 + a^2/b)) - (2*B*d^2*atanh((b^3*c^2*g^3
- a^2*b*d^2*g^3)/(b*g^3*(a*d - b*c)^2) - (2*b*d*x)/(a*d - b*c)))/(b*g^3*(a*
d - b*c)^2)
```

sympy [**B**] time = 2.74, size = 418, normalized size = 3.03

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}-\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{bg^3\left(ad-bc\right)^2}+\frac{Bd^2\log\left(x+\frac{\frac{Ba^3d^5}{(ad-bc)^2}}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b*
*3*g**3*x**2) - B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*
d**4/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b*
*3*c**3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)
**2) + B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d
- b*c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d*
*2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)**2) + (-A
*a*d + A*b*c - 3*B*a*d + B*b*c - 2*B*b*d*x)/(2*a**3*b*d*g**3 - 2*a**2*b**2*
c*g**3 + x**2*(2*a*b**3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4
*a*b**3*c*g**3))
```

3.126 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=177

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3bg^4(a+bx)^3}-\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}-\frac{}{9b}$$

```
[Out] -2/9*B/b/g^4/(b*x+a)^3+1/3*B*d/b/(-a*d+b*c)/g^4/(b*x+a)^2-2/3*B*d^2/b/(-a*d
+b*c)^2/g^4/(b*x+a)-2/3*B*d^3*ln(b*x+a)/b/(-a*d+b*c)^3/g^4+1/3*(-A-B*ln(e*(
b*x+a)^2/(d*x+c)^2))/b/g^4/(b*x+a)^3+2/3*B*d^3*ln(d*x+c)/b/(-a*d+b*c)^3/g^4
```

Rubi [A] time = 0.11, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3bg^4(a+bx)^3}-\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}-\frac{}{9b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B)/(9*b*g^4*(a + b*x)^3) + (B*d)/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) - (2
*B*d^2)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (2*B*d^3*Log[a + b*x])/(3*b*(b*
c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(3*b*g^4*(a + b*
x)^3) + (2*B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^4}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bg^4(a+bx)^3}+\frac{B\int\frac{2(bc-ad)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg} \\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4} \\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a}\right.}{3bg^4} \\
&= -\frac{2B}{9bg^4(a+bx)^3}+\frac{Bd}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2}{3b(bc-ad)^2g^4(a+bx)}-\frac{2Bd^3\log(a}{3b(bc-a}
\end{aligned}
$$

Mathematica [**A**] time = 0.17, size = 140, normalized size = 0.79

$$
-\frac{3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{B\left(-6d^3(a+bx)^3\log(c+dx)+6d^2(a+bx)^2(bc-ad)-3d(a+bx)(bc-ad)^2+2(bc-ad)^3+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}}{9bg^4(a+bx)^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] -1/9*(3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(2*(b*c - a*d)^3 - 3*
d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)
^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(b*g^4*(a
 + b*x)^3)
```

fricas [**B**] time = 0.59, size = 430, normalized size = 2.43

$$
-\frac{(3A+2B)b^3c^3-9(A+B)ab^2c^2d+9(A+2B)a^2bcd^2-(3A+11B)a^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)x^2-3\left(Bb^3\right.}{9\left(\left(b^7c^3-3ab^6c^2d+3a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3a^2b^5c^2d+3a^3b^4cd^2-a^4b^3\right.\right.}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/9*((3*A + 2*B)*b^3*c^3 - 9*(A + B)*a*b^2*c^2*d + 9*(A + 2*B)*a^2*b*c*d^2
 - (3*A + 11*B)*a^3*d^3 + 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*
d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 3*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x
^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log((
b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^7*c^3 - 3*a*
b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b
^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*
b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3
*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [**B**] time = 0.33, size = 473, normalized size = 2.67

$$
-\frac{2Bd^3\log(bx+a)}{3\left(b^4c^3g^4-3ab^3c^2dg^4+3a^2b^2cd^2g^4-a^3bd^3g^4\right)}+\frac{2Bd^3\log(dx+c)}{3\left(b^4c^3g^4-3ab^3c^2dg^4+3a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{}{3\left(b^4g^4\right.}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x, algorithm="giac
")
```

```
[Out] -2/3*B*d^3*log(b*x + a)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g^4 + 3*a^2*b^2*c*d^2*
g^4 - a^3*b*d^3*g^4) + 2/3*B*d^3*log(d*x + c)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*
g^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*log((b^2*x^2 + 2*a*b*x +
 a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2
*g^4*x + a^3*b*g^4) - 1/9*(6*B*b^2*d^2*x^2 - 3*B*b^2*c*d*x + 15*B*a*b*d^2*x
 + 3*A*b^2*c^2 + 5*B*b^2*c^2 - 6*A*a*b*c*d - 13*B*a*b*c*d + 3*A*a^2*d^2 + 1
4*B*a^2*d^2)/(b^6*c^2*g^4*x^3 - 2*a*b^5*c*d*g^4*x^3 + a^2*b^4*d^2*g^4*x^3 +
 3*a*b^5*c^2*g^4*x^2 - 6*a^2*b^4*c*d*g^4*x^2 + 3*a^3*b^3*d^2*g^4*x^2 + 3*a^
2*b^4*c^2*g^4*x - 6*a^3*b^3*c*d*g^4*x + 3*a^4*b^2*d^2*g^4*x + a^3*b^3*c^2*g
^4 - 2*a^4*b^2*c*d*g^4 + a^5*b*d^2*g^4)
```

maple [**B**] time = 0.16, size = 579, normalized size = 3.27

$$\frac{B\,b^2 d^3 \ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2 e}{d^2}\right)}{3\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^3\left(a^3d^3-3a^2c\,d^2b+3a\,c^2d\,b^2-b^3c^3\right)g^4}+\frac{A\,b^2d^3}{3\,(ad-bc)^3\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^3 g^4}+\frac{Bb}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x)
```

```
[Out] 1/3*d^3/g^4*A*b^2/(a*d-b*c)^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3+d^3/g^4*A/(
a*d-b*c)^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-d^3/g^4*A*b/(a*d-b*c)^3/(1/(d*x+
c)*a*d-1/(d*x+c)*b*c+b)^2-11/9*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B/
b/(d*x+c)^3+1/3*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*b^2*B/(a^3*d^3-3*
a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2
*e)-2/3*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B*b/(a^2*d^2-2*a*b*c*d+b^
2*c^2)/(d*x+c)-5/3*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B/(a*d-b*c)/(d
*x+c)^2+d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B/(a*d-b*c)/(d*x+c)^2*ln(
(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^3*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)
*b*c+b)^2/d^2*e)
```

maxima [**B**] time = 1.39, size = 480, normalized size = 2.71

$$-\frac{1}{9}\,B\left(\frac{6\,b^2d^2x^2+2\,b^2c^2-7\,abcd+11\,a^2d^2-3\left(b^2cd-5\,abd^2\right)x}{\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)g^4x^3+3\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\left(a^2b^4c^2-2\,a^3b^3cd+a^4b^2d^2\right)g^4x+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x, algorithm="maxi
ma")
```

```
[Out] -1/9*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2
 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 3*log
(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2)
+ a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^
2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*
d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x
^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

mupad [**B**] time = 5.80, size = 341, normalized size = 1.93

$$\frac{2\,A\,a\,c\,d}{3\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{A\,b\,c^2}{3\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{2\,B\,b\,c^2}{9\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{A\,a^2\,d^2}{3\,b\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{}{9\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(a*g + b*g*x)^4,x)
```

```
[Out] (2*A*a*c*d)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) - (B*d^3*atan((a*d*1i + b*c*1
i + b*d*x*2i)/(a*d - b*c))*4i)/(3*b*g^4*(a*d - b*c)^3) - (A*b*c^2)/(3*g^4*(
a*d - b*c)^2*(a + b*x)^3) - (2*B*b*c^2)/(9*g^4*(a*d - b*c)^2*(a + b*x)^3) -
 (A*a^2*d^2)/(3*b*g^4*(a*d - b*c)^2*(a + b*x)^3) - (11*B*a^2*d^2)/(9*b*g^4*
(a*d - b*c)^2*(a + b*x)^3) - (5*B*a*d^2*x)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3
) - (2*B*b*d^2*x^2)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) - (B*log((e*(a + b*x)
^2)/(c + d*x)^2))/(3*b*g^4*(a + b*x)^3) + (7*B*a*c*d)/(9*g^4*(a*d - b*c)^2*
(a + b*x)^3) + (B*b*c*d*x)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3)
```

sympy [B] time = 4.24, size = 677, normalized size = 3.82

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}-\frac{2Bd^3\log\left(x+\frac{-\frac{2Ba^4d^7}{(ad-bc)^3}+\frac{8Ba^3bcd^6}{(ad-bc)^3}-\frac{12Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{8Bab^3c^3d^4}{(ad-bc)^3}+2Bad^4-\frac{2Bb^4c^4d^3}{(ad-bc)^3}+2B}{4Bbd^4}\right)}{3bg^4(ad-bc)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9
*a*b**3*g**4*x**2 + 3*b**4*g**4*x**3) - 2*B*d**3*log(x + (-2*B*a**4*d**7/(a
*d - b*c)**3 + 8*B*a**3*b*c*d**6/(a*d - b*c)**3 - 12*B*a**2*b**2*c**2*d**5/
(a*d - b*c)**3 + 8*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 - 2*B*b**
4*c**4*d**3/(a*d - b*c)**3 + 2*B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b
*c)**3) + 2*B*d**3*log(x + (2*B*a**4*d**7/(a*d - b*c)**3 - 8*B*a**3*b*c*d**
6/(a*d - b*c)**3 + 12*B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 8*B*a*b**3*c**
3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 + 2*B*b**4*c**4*d**3/(a*d - b*c)**3 + 2*
B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) + (-3*A*a**2*d**2 + 6*A
*a*b*c*d - 3*A*b**2*c**2 - 11*B*a**2*d**2 + 7*B*a*b*c*d - 2*B*b**2*c**2 - 6
*B*b**2*d**2*x**2 + x*(-15*B*a*b*d**2 + 3*B*b**2*c*d))/(9*a**5*b*d**2*g**4
- 18*a**4*b**2*c*d*g**4 + 9*a**3*b**3*c**2*g**4 + x**3*(9*a**2*b**4*d**2*g*
*4 - 18*a*b**5*c*d*g**4 + 9*b**6*c**2*g**4) + x**2*(27*a**3*b**3*d**2*g**4
- 54*a**2*b**4*c*d*g**4 + 27*a*b**5*c**2*g**4) + x*(27*a**4*b**2*d**2*g**4
- 54*a**3*b**3*c*d*g**4 + 27*a**2*b**4*c**2*g**4))
```

3.127 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=208

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}+\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}+6bg$$

```
[Out] -1/8*B/b/g^5/(b*x+a)^4+1/6*B*d/b/(-a*d+b*c)/g^5/(b*x+a)^3-1/4*B*d^2/b/(-a*d
+b*c)^2/g^5/(b*x+a)^2+1/2*B*d^3/b/(-a*d+b*c)^3/g^5/(b*x+a)+1/2*B*d^4*ln(b*x
+a)/b/(-a*d+b*c)^4/g^5+1/4*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/g^5/(b*x+a)^4
-1/2*B*d^4*ln(d*x+c)/b/(-a*d+b*c)^4/g^5
```

Rubi [A] time = 0.14, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}+6bg$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] -B/(8*b*g^5*(a + b*x)^4) + (B*d)/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2
)/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3)/(2*b*(b*c - a*d)^3*g^5*(a +
 b*x)) + (B*d^4*Log[a + b*x])/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(a +
b*x)^2)/(c + d*x)^2])/(4*b*g^5*(a + b*x)^4) - (B*d^4*Log[c + d*x])/(2*b*(b*
c - a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^5}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4bg^5(a+bx)^4}+\frac{B\int\frac{2(bc-ad)}{g^4(a+bx)^5(c+dx)}\,dx}{4bg}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^5(c+dx)}\,dx}{2bg^5}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^5}-\frac{bd}{(bc-ad)^2(a+bx)^4}+\frac{bd^2}{(bc-ad)^3(a+b}\right.}{2bg^5}\\ &= -\frac{B}{8bg^5(a+bx)^4}+\frac{Bd}{6b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2}{4b(bc-ad)^2g^5(a+bx)^2}+\frac{}{2b(bc-a}\end{aligned}$$

Mathematica [A] time = 0.22, size = 162, normalized size = 0.78

$$-\frac{6\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{B\left(12d^4(a+bx)^4\log(c+dx)+12d^3(a+bx)^3(ad-bc)+6d^2(a+bx)^2(bc-ad)^2+4d(a+bx)(ad-bc)^3+3(bc-ad)^4-12d^4(a-\right.}{(bc-ad)^4}}{24bg^5(a+bx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] -1/24*(6*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(3*(b*c - a*d)^4 + 4
*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-
(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*
x)^4*Log[c + d*x]))/(b*c - a*d)^4)/(b*g^5*(a + b*x)^4)
```

fricas [B] time = 0.95, size = 654, normalized size = 3.14

$$-\frac{3\,(2\,A+B)b^4c^4-8\,(3\,A+2\,B)ab^3c^3d+36\,(A+B)a^2b^2c^2d^2-24\,(A+2\,B)a^3bcd^3+(6\,A+25\,B)a^4d^4-12\,\left(B\right.}{24\,\left(\left(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\right)g^5x^4+4\,\left(ab^8c^4-4\,a^2b^7c^3d+6\,a\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/24*(3*(2*A + B)*b^4*c^4 - 8*(3*A + 2*B)*a*b^3*c^3*d + 36*(A + B)*a^2*b^2
*c^2*d^2 - 24*(A + 2*B)*a^3*b*c*d^3 + (6*A + 25*B)*a^4*d^4 - 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 6*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*B
*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*
b*c*d^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((
b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4
)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*
c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5
*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*
b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4
*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^
4)*g^5)
```

giac [B] time = 0.77, size = 419, normalized size = 2.01

$$-\frac{Bd^4\log\left(-\frac{bcg}{bgx+ag}+\frac{adg}{bgx+ag}-d\right)}{2\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+a^4bd^4g^5\right)}+\frac{Bd^3}{2\left(b^3c^3g^3-3\,ab^2c^2dg^3+3\,a^2bcd^2g^3-a^3d^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x, algorithm="giac
")
```

```
[Out] -1/2*B*d^4*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g) - d)/(b^5*c^4*g^5
 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*
d^4*g^5) + 1/2*B*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3
- a^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 1/4*B*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a
^2*d^2*g)*(b*g*x + a*g)^2*b*g^2) - 1/4*B*log(b^2/(b^2*c^2*g^2/(b*g*x + a*g)
^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*
g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))/((b*g*x + a*g)^4*b*g) + 1
/6*B*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2) - 1/8*(2*A*b^3*g^3 + 3*B*b^3*g^3
)/((b*g*x + a*g)^4*b^4*g^4)
```

maple [B] time = 0.22, size = 833, normalized size = 4.00

$$\frac{B\,b^3d^4\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2 e}{d^2}\right)}{4\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^4\left(a^4d^4-4a^3c\,d^3b+6a^2c^2d^2b^2-4a\,c^3d\,b^3+c^4b^4\right)g^5}-\frac{A\,b^3d^4}{4\,(ad-bc)^4\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^4 g^5}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x)
```

```
[Out] d^4/g^5*A*b^2/(a*d-b*c)^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3-1/4*d^4/g^5*A*b
^3/(a*d-b*c)^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4+d^4/g^5*A/(a*d-b*c)^4/(1/(
d*x+c)*a*d-1/(d*x+c)*b*c+b)-3/2*d^4/g^5*A*b/(a*d-b*c)^4/(1/(d*x+c)*a*d-1/(d
*x+c)*b*c+b)^2-25/24*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B/b/(d*x+c)^
4+1/4*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*b^3*B/(a^4*d^4-4*a^3*b*c*d^
3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+
b)^2/d^2*e)-1/2*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B*b^2/(a^3*d^3-3*
a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)-7/4*d^4/g^5/(1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)^4*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2-13/6*d^4/g^5/(1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)^4*B/(a*d-b*c)/(d*x+c)^3+d^4/g^5/(1/(d*x+c)*a*d-1/
(d*x+c)*b*c+b)^4*B/(a*d-b*c)/(d*x+c)^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2
/d^2*e)+3/2*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*b*B/(a^2*d^2-2*a*b*c*
d+b^2*c^2)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+d^4/g^5/(1
/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-
b^3*c^3)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)
```

maxima [B] time = 1.62, size = 699, normalized size = 3.36

$$\frac{1}{24}\,B\left(\frac{12\,b^3d^3x^3-3\,b^3c^3+13\,ab^2c^2d-23\,a^2bcd^2}{\left(b^8c^3-3\,ab^7c^2d+3\,a^2b^6cd^2-a^3b^5d^3\right)g^5x^4+4\left(ab^7c^3-3\,a^2b^6c^2d+3\,a^3b^5cd^2-a^4b^4d^3\right)g^5x^3+6\left(a^2b^6c^3-\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/24*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*
a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)
*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*
g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)
*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3
)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5
```

```
) - 6*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*
x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((
b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*
g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 +
 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

mupad [**B**] time = 6.51, size = 579, normalized size = 2.78

$$-\frac{\frac{6\,A\,a^3\,d^3-6\,A\,b^3\,c^3+25\,B\,a^3\,d^3-3\,B\,b^3\,c^3+18\,A\,a\,b^2\,c^2\,d-18\,A\,a^2\,b\,c\,d^2+13\,B\,a\,b^2\,c^2\,d-23\,B\,a^2\,b\,c\,d^2}{12\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}-\frac{d^2\,x^2\,\left(B\,b^3\,c-7\,B\,a\,b^2\,d\right)}{2\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}+\frac{d}{3}}{2\,a^4\,b\,g^5+8\,a^3\,b^2\,g^5\,x+12\,a^2\,b^3\,g^5\,x^2+8\,a\,b^4\,g^5\,x^3+2\,b^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(a*g + b*g*x)^5,x)
```

```
[Out] - ((6*A*a^3*d^3 - 6*A*b^3*c^3 + 25*B*a^3*d^3 - 3*B*b^3*c^3 + 18*A*a*b^2*c^2
*d - 18*A*a^2*b*c*d^2 + 13*B*a*b^2*c^2*d - 23*B*a^2*b*c*d^2)/(12*(a^3*d^3 -
 b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (d^2*x^2*(B*b^3*c - 7*B*a*b^2*
d))/(2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d*x*(B*b^3*c
^2 + 13*B*a^2*b*d^2 - 5*B*a*b^2*c*d))/(3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d
 - 3*a^2*b*c*d^2)) + (B*b^3*d^3*x^3)/(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3
*a^2*b*c*d^2))/(2*a^4*b*g^5 + 2*b^5*g^5*x^4 + 8*a^3*b^2*g^5*x + 8*a*b^4*g^5
*x^3 + 12*a^2*b^3*g^5*x^2) - (B*log((e*(a + b*x)^2)/(c + d*x)^2))/(4*b^2*g^
5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3)) - (B*d^4*atanh((
2*b^5*c^4*g^5 - 2*a^4*b*d^4*g^5 - 4*a*b^4*c^3*d*g^5 + 4*a^3*b^2*c*d^3*g^5)/
(2*b*g^5*(a*d - b*c)^4) - (2*b*d*x*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a
^2*b*c*d^2))/(a*d - b*c)^4))/(b*g^5*(a*d - b*c)^4)
```

sympy [**B**] time = 5.81, size = 947, normalized size = 4.55

$$-\frac{B\log{\left(\frac{e\left(a+bx\right)^{2}}{\left(c+dx\right)^{2}}\right)}}{4a^{4}bg^{5}+16a^{3}b^{2}g^{5}x+24a^{2}b^{3}g^{5}x^{2}+16ab^{4}g^{5}x^{3}+4b^{5}g^{5}x^{4}}-\frac{Bd^{4}\log{\left(x+\frac{-\frac{Ba^{5}d^{9}}{\left(ad-bc\right)^{4}}+\frac{5Ba^{4}bcd^{8}}{\left(ad-bc\right)^{4}}-\frac{10Ba^{3}b^{2}c^{2}d^{7}}{\left(ad-bc\right)^{4}}+\frac{10Ba^{2}b^{3}c^{3}d^{6}}{\left(ad-bc\right)^{4}}}{2Bbd^{5}}\right.}}{2bg^{5}\left(ad-bc\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x +
24*a**2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) - B*d**4*l
og(x + (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10
*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c
)**4 - 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a
*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) + B*d**4
*log(x + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 1
0*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*
c)**4 + 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(
a*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) + (-6*A
*a**3*d**3 + 18*A*a**2*b*c*d**2 - 18*A*a*b**2*c**2*d + 6*A*b**3*c**3 - 25*B
*a**3*d**3 + 23*B*a**2*b*c*d**2 - 13*B*a*b**2*c**2*d + 3*B*b**3*c**3 - 12*B
*b**3*d**3*x**3 + x**2*(-42*B*a*b**2*d**3 + 6*B*b**3*c*d**2) + x*(-52*B*a**
2*b*d**3 + 20*B*a*b**2*c*d**2 - 4*B*b**3*c**2*d))/(24*a**7*b*d**3*g**5 - 72
*a**6*b**2*c*d**2*g**5 + 72*a**5*b**3*c**2*d*g**5 - 24*a**4*b**4*c**3*g**5
+ x**4*(24*a**3*b**5*d**3*g**5 - 72*a**2*b**6*c*d**2*g**5 + 72*a*b**7*c**2*
d*g**5 - 24*b**8*c**3*g**5) + x**3*(96*a**4*b**4*d**3*g**5 - 288*a**3*b**5*
c*d**2*g**5 + 288*a**2*b**6*c**2*d*g**5 - 96*a*b**7*c**3*g**5) + x**2*(144*
```

```
a**5*b**3*d**3*g**5 - 432*a**4*b**4*c*d**2*g**5 + 432*a**3*b**5*c**2*d*g**5
 - 144*a**2*b**6*c**3*g**5) + x*(96*a**6*b**2*d**3*g**5 - 288*a**5*b**3*c*d
**2*g**5 + 288*a**4*b**4*c**2*d*g**5 - 96*a**3*b**5*c**3*g**5))
```

3.128 $\int (ag+bgx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=377

$$\frac{2Bg^4(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+6A+25B\right)}{15bd^5}+\frac{2Bg^4(a+bx)(bc-ad)^4\bigg(6B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+6A+}{15bd^4}$$

```
[Out] -1/5*B*(-a*d+b*c)*g^4*(b*x+a)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d+1/5*g^4
*(b*x+a)^5*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b+2/15*B*(-a*d+b*c)^2*g^4*(b*x
+a)^3*(2*A+B+2*B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^2-1/15*B*(-a*d+b*c)^3*g^4*(
b*x+a)^2*(6*A+7*B+6*B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^3+2/15*B*(-a*d+b*c)^4*
g^4*(b*x+a)*(6*A+13*B+6*B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^4+2/15*B*(-a*d+b*c
)^5*g^4*(6*A+25*B+6*B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b
/d^5+8/5*B^2*(-a*d+b*c)^5*g^4*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^5
```

Rubi [A] time = 0.87, antiderivative size = 569, normalized size of antiderivative = 1.51, number of steps used = 28, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}-\frac{4Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{5bd^5}-\frac{2Bg^4(a+bx)^2(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (4*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (26*B^2*(b*c - a*d)^4*g^4*x)/(15*d^4)
 - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(15*b*d^3) + (2*B^2*(b*c - a*d)^2*
g^4*(a + b*x)^3)/(15*b*d^2) + (4*B^2*(b*c - a*d)^4*g^4*(a + b*x)*Log[(e*(a
+ b*x)^2)/(c + d*x)^2])/(5*b*d^4) - (2*B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*b*d^3) + (4*B*(b*c - a*d)^2*g^4*(a
 + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(15*b*d^2) - (B*(b*c -
a*d)*g^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*b*d) + (g
^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(5*b) - (10*B^2*
(b*c - a*d)^5*g^4*Log[c + d*x])/(3*b*d^5) + (8*B^2*(b*c - a*d)^5*g^4*Log[-(
(d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(5*b*d^5) - (4*B*(b*c - a*d)^5*g^
4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(5*b*d^5) - (4*B^2
*(b*c - a*d)^5*g^4*Log[c + d*x]^2)/(5*b*d^5) + (8*B^2*(b*c - a*d)^5*g^4*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/(5*b*d^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{(2B)\int \frac{2(bc-ad)g^5(a+bx)^4\left(A+\right.}{c+dx}}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int \frac{(a+bx)^4}{}}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int\left(-\frac{b(bc}{}\right.}{}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int(a+b}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} - \frac{2B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(a+}{(c+d}\right.\right.}{5bd^3}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{4B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{5bd^4} - $$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{4B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{5bd^4} - $$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{15bd^3}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{15bd^3}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{15bd^3}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+}{15bd^3}$$

Mathematica [A] time = 0.46, size = 523, normalized size = 1.39

$$g^4\left(\frac{B(bc-ad)\left(-3d^4(a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+4d^3(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-6d^2(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-12(bc-ad)^4\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (B*(b*c - a*
d)*(12*A*b*d*(b*c - a*d)^3*x + 12*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b
*x)^2)/(c + d*x)^2] - 6*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2]) + 4*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x)
^2)/(c + d*x)^2]) - 3*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 12*(b*c - a*d)^4*(A + B*Log[(e*(a +
 b*x)^2)/(c + d*x)^2])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*
(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*
(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Lo
g[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^
5)))/(5*b)
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \Big(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((b^2*e*x^2 + 2*a
*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a
*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log
((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^{4} \left(B \log\left(\frac{(bx + a)^{2} e}{(dx + c)^{2}}\right) + A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^4*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 1.37, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^{4} \left(B \ln\left(\frac{(bx + a)^{2} e}{(dx + c)^{2}}\right) + A\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

maxima [B] time = 3.09, size = 2650, normalized size = 7.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*
x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/
b - 2*c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d
*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
+ c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x
/(b*d))*A*B*a^3*b*g^4 + 4*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*
a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 2/3*(3*x^4*log(b^2*e*x^
2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(
d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4
 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*
c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/15*(6*x^5*log(b^2*e*x^2/(d^2
*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^
2 + 2*c*d*x + c^2)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (
3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*
c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 +
 A^2*a^4*g^4*x - 2/15*((6*g^4*log(e) + 25*g^4)*b^4*c^5 - (30*g^4*log(e) + 1
13*g^4)*a*b^3*c^4*d + 4*(15*g^4*log(e) + 49*g^4)*a^2*b^2*c^3*d^2 - 12*(5*g^
4*log(e) + 13*g^4)*a^3*b*c^2*d^3 + 6*(5*g^4*log(e) + 8*g^4)*a^4*c*d^4)*B^2*
log(d*x + c)/d^5 - 8/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^
2*g^4 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^5) + 1/15*(3*B^2*b^5*d^5*g^4*x^5*log(e)^2 - 3*(b^5*c*d^4*g^4*log
(e) - (5*g^4*log(e)^2 + g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 2*((2*g^4*log(e) +
 g^4)*b^5*c^2*d^3 - 2*(5*g^4*log(e) + g^4)*a*b^4*c*d^4 + (15*g^4*log(e)^2 +
 8*g^4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 - ((6*g^4*log(e) + 7*g^4)*b^5*c^3
*d^2 - 3*(10*g^4*log(e) + 9*g^4)*a*b^4*c^2*d^3 + 3*(20*g^4*log(e) + 11*g^4)
*a^2*b^3*c*d^4 - (30*g^4*log(e)^2 + 36*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^
2*x^2 + (2*(6*g^4*log(e) + 13*g^4)*b^5*c^4*d - 2*(30*g^4*log(e) + 59*g^4)*a
*b^4*c^3*d^2 + 12*(10*g^4*log(e) + 17*g^4)*a^2*b^3*c^2*d^3 - 2*(60*g^4*log(
e) + 79*g^4)*a^3*b^2*c*d^4 + (15*g^4*log(e)^2 + 48*g^4*log(e) + 46*g^4)*a^4
*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*
a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x +
B^2*a^5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5
*g^4*x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*
a^4*b*d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4
 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 + 2*(6*B
^2*b^5*d^5*g^4*x^5*log(e) - 3*(b^5*c*d^4*g^4 - (10*g^4*log(e) + g^4)*a*b^4*
d^5)*B^2*x^4 + 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + (15*g^4*log(e) + 4*
g^4)*a^2*b^3*d^5)*B^2*x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a
^2*b^3*c*d^4*g^4 - 2*(5*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 6*(2*b^5
*c^4*d*g^4 - 10*a*b^4*c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d
^4*g^4 + (5*g^4*log(e) + 8*g^4)*a^4*b*d^5)*B^2*x + (12*a*b^4*c^4*d*g^4 - 54
*a^2*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 + (6*g^4
*log(e) + 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) - 2*(6*B^2*b^5*d^5*g^4*x^5*log
(e) - 3*(b^5*c*d^4*g^4 - (10*g^4*log(e) + g^4)*a*b^4*d^5)*B^2*x^4 + 4*(b^5*
c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + (15*g^4*log(e) + 4*g^4)*a^2*b^3*d^5)*B^2*
x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 - 2*(
5*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 6*(2*b^5*c^4*d*g^4 - 10*a*b^4*
c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d^4*g^4 + (5*g^4*log(e)
 + 8*g^4)*a^4*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*
x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b
*d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)^4\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^4*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.129 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 \, dx$

Optimal. Leaf size=319

$$-\frac{Bg^3(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+3A+11B\right)}{3bd^4}-\frac{Bg^3(a+bx)(bc-ad)^3\left(3B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+3A+}{3bd^3}$$

```
[Out] -1/3*B*(-a*d+b*c)*g^3*(b*x+a)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d+1/4*g^3
*(b*x+a)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b+1/6*B*(-a*d+b*c)^2*g^3*(b*x+
a)^2*(3*A+2*B+3*B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^2-1/3*B*(-a*d+b*c)^3*g^3*(
b*x+a)*(3*A+5*B+3*B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^3-1/3*B*(-a*d+b*c)^4*g^3
*(3*A+11*B+3*B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b/d^4-2*
B^2*(-a*d+b*c)^4*g^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^4
```

Rubi [A] time = 0.76, antiderivative size = 470, normalized size of antiderivative = 1.47, number of steps used = 24, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{2B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^4}+\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd^4}+\frac{Bg^3(a+bx)^2(bc-a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)^3*g^3*x)/d^3) - (5*B^2*(b*c - a*d)^3*g^3*x)/(3*d^3) + (B
^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/(3*b*d^2) - (B^2*(b*c - a*d)^3*g^3*(a + b
*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b*d^3) + (B*(b*c - a*d)^2*g^3*(a + b
*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*b*d^2) - (B*(b*c - a*d)*
g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*d) + (g^3*(a
 + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(4*b) + (11*B^2*(b*c
- a*d)^4*g^3*Log[c + d*x])/(3*b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^4) + (B*(b*c - a*d)^4*g^3*(A + B*
Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*d^4) + (B^2*(b*c - a*d)^
4*g^3*Log[c + d*x]^2)/(b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/(b*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{B\int\frac{2(bc-ad)g^4(a+bx)^3\left(A+B\,\mathrm{lo}\right.}{c+dx}}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3\left(\right.}{}}{b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad}{}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int(a+bx)}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} + \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx}{(c+dx}\right.\right.}{2bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd^3} + \frac{B}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd^3} + \frac{B}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+b}{3bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+b}{3bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+b}{3bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+b}{3bd^2}$$

Mathematica [A] time = 0.32, size = 402, normalized size = 1.26

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2 - \frac{2B(bc-ad)\left(2d^3(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+3d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-6(bc-ad\right.\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (2*B*(b*c -
a*d)*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b
*x)^2)/(c + d*x)^2] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b
*x)^2)/(c + d*x)^2]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]) - 12*B*(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[c + d*x] + 2*B*(b*c - a*d)*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 6*B*(b*c - a*d)^2*(b*
d*x + (-(b*c) + a*d)*Log[c + d*x]) + 6*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])))/(3*d^4)))/(4*b)
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2
*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*
log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^3 \left(B\log\left(\frac{(bx + a)^2 e}{(dx + c)^2}\right) + A\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 1.20, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^3 \left(B\ln\left(\frac{(bx + a)^2\, e}{(dx + c)^2}\right) + A\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [B] time = 2.98, size = 1948, normalized size = 6.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) +
 a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d
)*A*B*a^3*g^3 + 3*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/
(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*
x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3
+ 2*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c
*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2
*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)
/(b^2*d^2))*A*B*a*b^2*g^3 + 1/6*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2
*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d
^3))*A*B*b^3*g^3 + A^2*a^3*g^3*x + 1/3*((3*g^3*log(e) + 11*g^3)*b^3*c^4 - 2
*(6*g^3*log(e) + 19*g^3)*a*b^2*c^3*d + 9*(2*g^3*log(e) + 5*g^3)*a^2*b*c^2*d
^2 - 6*(2*g^3*log(e) + 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 2*(b^4*c^4*
g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d
^4*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 - 4*(
b^4*c*d^3*g^3*log(e) - (3*g^3*log(e)^2 + g^3*log(e))*a*b^3*d^4)*B^2*x^3 + 2
*((3*g^3*log(e) + 2*g^3)*b^4*c^2*d^2 - 4*(3*g^3*log(e) + g^3)*a*b^3*c*d^3 +
 (9*g^3*log(e)^2 + 9*g^3*log(e) + 2*g^3)*a^2*b^2*d^4)*B^2*x^2 - 4*((3*g^3*l
og(e) + 5*g^3)*b^4*c^3*d - (12*g^3*log(e) + 17*g^3)*a*b^3*c^2*d^2 + (18*g^3
*log(e) + 19*g^3)*a^2*b^2*c*d^3 - (3*g^3*log(e)^2 + 9*g^3*log(e) + 7*g^3)*a
^3*b*d^4)*B^2*x + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2
*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a
)^2 + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4
*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2
*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 + 4*(3*B^2*b^4*d^
4*g^3*x^4*log(e) - 2*(b^4*c*d^3*g^3 - (6*g^3*log(e) + g^3)*a*b^3*d^4)*B^2*x
^3 + 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 + 3*(2*g^3*log(e) + g^3)*a^2*b^
2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g
^3 - (2*g^3*log(e) + 3*g^3)*a^3*b*d^4)*B^2*x - (6*a*b^3*c^3*d*g^3 - 21*a^2*
b^2*c^2*d^2*g^3 + 26*a^3*b*c*d^3*g^3 - (3*g^3*log(e) + 11*g^3)*a^4*d^4)*B^2
)*log(b*x + a) - 4*(3*B^2*b^4*d^4*g^3*x^4*log(e) - 2*(b^4*c*d^3*g^3 - (6*g^
3*log(e) + g^3)*a*b^3*d^4)*B^2*x^3 + 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3
 + 3*(2*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3 - 4*a*b^3
*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 - (2*g^3*log(e) + 3*g^3)*a^3*b*d^4)*B^2*
x + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c)
)/(b*d^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g+b g x\right)^3 \left(A+B \ln\left(\frac{e (a+b x)^2}{(c+d x)^2}\right)\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.130 $\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx$

Optimal. Leaf size=255

$$\frac{4Bg^2(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A+3B\right)}{3bd^3}+\frac{4Bg^2(a+bx)(bc-ad)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A+B\right)}{3bd^2}-2Bg$$

```
[Out] -2/3*B*(-a*d+b*c)*g^2*(b*x+a)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d+1/3*g^2
*(b*x+a)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b+4/3*B*(-a*d+b*c)^2*g^2*(b*x+
a)*(A+B+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^2+4/3*B*(-a*d+b*c)^3*g^2*(A+3*B+B*
ln(e*(b*x+a)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b/d^3+8/3*B^2*(-a*d+b*c
)^3*g^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^3
```

Rubi [A] time = 0.62, antiderivative size = 397, normalized size of antiderivative = 1.56, number of steps used = 20, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}-\frac{4Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3bd^3}+\frac{4ABg^2x(bc-ad)^2}{3d^2}-2Bg$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (4*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (4*B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) +
 (4*B^2*(b*c - a*d)^2*g^2*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(3*b*
d^2) - (2*B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2]))/(3*b*d) + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^
2)/(3*b) - (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (8*B^2*(b*c - a
*d)^3*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (4*B*
(b*c - a*d)^3*g^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(3
*b*d^3) - (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x]^2)/(3*b*d^3) + (8*B^2*(b*c
- a*d)^3*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx &= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b}-\frac{(2B)\int\frac{2(bc-ad)g^3(a+bx)^2\left(A+B\,\mathrm{lo}\right.}{c+dx}}{3bg}\\
&= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b}-\frac{\left(4B(bc-ad)g^2\right)\int\frac{(a+bx)^2\left(A+\right.}{}}{3b}\\
&= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b}-\frac{\left(4B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{}\right.}{}\\
&= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b}-\frac{\left(4B(bc-ad)g^2\right)\int(a+bx)\left(\right.}{3d}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}-\frac{2B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{3bd}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bd^2}-\frac{2B(}{}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bd^2}-\frac{2B(}{}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2(a+bx}{3bd^2}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2(a+bx}{3bd^2}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2(a+bx}{3bd^2}\\
&= \frac{4AB(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2x}{3d^2}+\frac{4B^2(bc-ad)^2g^2(a+bx}{3bd^2}
\end{aligned}$$

Mathematica [A]   time = 0.22, size = 298, normalized size = 1.17

$$\frac{g^2\left(\frac{2B(bc-ad)\left(-d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+2Abdx(bc-ad)+2Bd(a+bx)(bc-ad)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+2B(bc-\right.}{d^3}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*(b*c -
a*d)*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x)^
2)/(c + d*x)^2] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
- 4*B*(b*c - a*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2])*Log[c + d*x] + 2*B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log
[c + d*x]) + 2*B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(
3*b)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*
x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^
2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^2\left(B\log\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 1.16, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^2\left(B\ln\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [B] time = 2.63, size = 1326, normalized size = 5.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d
*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
+ c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log
(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2)
+ a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x
```

```
 + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 2/3*(x^3*log(b^2*e*x^2/(d^
2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x
^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 +
A^2*a^2*g^2*x - 4/3*((g^2*log(e) + 3*g^2)*b^2*c^3 - (3*g^2*log(e) + 7*g^2)*
a*b*c^2*d + (3*g^2*log(e) + 4*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 8/3*(b
^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 - (2*b^3*c*d^2*g^2*log(e)
 - (3*g^2*log(e)^2 + 2*g^2*log(e))*a*b^2*d^3)*B^2*x^2 + (4*(g^2*log(e) + g^
2)*b^3*c^2*d - 4*(3*g^2*log(e) + 2*g^2)*a*b^2*c*d^2 + (3*g^2*log(e)^2 + 8*g
^2*log(e) + 4*g^2)*a^2*b*d^3)*B^2*x + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*
d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + 4*(
B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^
3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 + 4*
(B^2*b^3*d^3*g^2*x^3*log(e) - (b^3*c*d^2*g^2 - (3*g^2*log(e) + g^2)*a*b^2*d
^3)*B^2*x^2 + (2*b^3*c^2*d*g^2 - 6*a*b^2*c*d^2*g^2 + (3*g^2*log(e) + 4*g^2)
*a^2*b*d^3)*B^2*x + (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 + (g^2*log(e) +
3*g^2)*a^3*d^3)*B^2)*log(b*x + a) - 4*(B^2*b^3*d^3*g^2*x^3*log(e) - (b^3*c*
d^2*g^2 - (3*g^2*log(e) + g^2)*a*b^2*d^3)*B^2*x^2 + (2*b^3*c^2*d*g^2 - 6*a*
b^2*c*d^2*g^2 + (3*g^2*log(e) + 4*g^2)*a^2*b*d^3)*B^2*x + 2*(B^2*b^3*d^3*g^
2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*
log(b*x + a))*log(d*x + c))/(b*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)^2\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.131 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=188

$$-\frac{2Bg(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A+2B\right)}{bd^2}-\frac{2Bg(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd}+ g(a+$$

```
[Out] -2*B*(-a*d+b*c)*g*(b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d+1/2*g*(b*x+a)
^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b-2*B*(-a*d+b*c)^2*g*(A+2*B+B*ln(e*(b*
x+a)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b/d^2-4*B^2*(-a*d+b*c)^2*g*poly
log(2,d*(b*x+a)/b/(d*x+c))/b/d^2
```

Rubi [A] time = 0.49, antiderivative size = 291, normalized size of antiderivative = 1.55, number of steps used = 16, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{4B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}+\frac{2Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(}{(c}\right.\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g*x)/d - (2*B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x
)^2)/(c + d*x)^2])/(b*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])^2)/(2*b) + (4*B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) - (4*B^2*(b
*c - a*d)^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^2) + (2*
B*(b*c - a*d)^2*g*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b
*d^2) + (2*B^2*(b*c - a*d)^2*g*Log[c + d*x]^2)/(b*d^2) - (4*B^2*(b*c - a*d)
^2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{B\int \frac{2(bc-ad)g^2(a+bx)\left(A+B\log\left(\frac{e}{(}\right.\right.}{c+dx}}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int \frac{(a+bx)\left(A+B\right.}{c}}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int\left(\frac{b\left(A+B\log\right.}{}\right.}{}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int\left(A+B\,\mathrm{lo}\right.}{d}$$

$$= -\frac{2AB(bc-ad)gx}{d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} + \frac{2B(bc}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a}{}$$

Mathematica [A] time = 0.17, size = 207, normalized size = 1.10

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2 - \frac{4B(bc-ad)\left(-(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+Bd(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+B(bc-ad)\left(2\mathrm{Li}_2\left(\frac{b}{}\right.\right.\right.}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (4*B*(b*c - a*
d)*(A*b*d*x + B*d*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2] - 2*B*(b*c - a
*d)*Log[c + d*x] - (b*c - a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log
[c + d*x] + B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^2))/(2*b)
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{b^2ex^2 + 2\,abe}{d^2x^2 + 2\,cd}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b^2*e*x^2 + 2*a*b
*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b
^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)\left(B\log\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 0.95, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)\left(B\ln\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [B] time = 2.42, size = 727, normalized size = 3.87

$$\frac{1}{2}A^2bgx^2 + 2\left(x\log\left(\frac{b^2ex^2}{d^2x^2 + 2\,cdx + c^2} + \frac{2\,abex}{d^2x^2 + 2\,cdx + c^2} + \frac{a^2e}{d^2x^2 + 2\,cdx + c^2}\right) + \frac{2\,a\log\left(bx + a\right)}{b} - \frac{2\,c\log\left(dx\right.}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/
(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x
+ a)/b - 2*c*log(d*x + c)/d)*A*B*a*g + (x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*
x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x +
 c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/
(b*d))*A*B*b*g + A^2*a*g*x + 2*((g*log(e) + 2*g)*b*c^2 - 2*(g*log(e) + g)*a
*c*d)*B^2*log(d*x + c)/d^2 + 4*(b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b
*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*
d)))*B^2/(b*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 - 2*(2*b^2*c*d*g*log(e)
- (g*log(e)^2 + 2*g*log(e))*a*b*d^2)*B^2*x + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a)^2 + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x - (b^2*c^2*g - 2*a*b*c*d*g)*B^2)*log(d*x + c)^2 + 4*(B^2*b^2*d^2
*g*x^2*log(e) + 2*((g*log(e) + g)*a*b*d^2 - b^2*c*d*g)*B^2*x + ((g*log(e) +
```

```
 2*g)*a^2*d^2 - 2*a*b*c*d*g)*B^2)*log(b*x + a) - 4*(B^2*b^2*d^2*g*x^2*log(e
) + 2*((g*log(e) + g)*a*b*d^2 - b^2*c*d*g)*B^2*x + 2*(B^2*b^2*d^2*g*x^2 + 2
*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.132 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=132

$$\frac{4B\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{bg}+\frac{8B^2\text{Li}_3\left(\frac{b(c+dx)}{d(a+bx)}\right)}{bg}$$

```
[Out] -(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b/g+4*B*(A+B*l
n(e*(b*x+a)^2/(d*x+c)^2))*polylog(2,b*(d*x+c)/d/(b*x+a))/b/g+8*B^2*polylog(
3,b*(d*x+c)/d/(b*x+a))/b/g
```

Rubi [B] time = 4.14, antiderivative size = 749, normalized size of antiderivative = 5.67, number of steps used = 46, number of rules used = 23, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.676, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396}

$$\frac{4AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}-\frac{4B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+\log\left((a+bx)^2\right)+\log\left(\frac{1}{(c+dx)^2}\right)\right)}{bg}-8B^2\text{P}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (-2*A*B*Log[g*(a + b*x)]^2)/(b*g) + (4*B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (4
*B^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b*g) + (4*B^2*Log[g*(a + b*x)]*Log[
(a + b*x)^2]*Log[-c - d*x])/(b*g) - (B^2*Log[(a + b*x)^2]^2*Log[-c - d*x])/
(b*g) + (B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-2)]^2)/(b*g)
 - (B^2*Log[g*(a + b*x)]*Log[(c + d*x)^(-2)]^2)/(b*g) + (4*B^2*Log[g*(a + b
*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g) + (B^2*Log[(a + b*x)^2]^2*Log[
(b*(c + d*x))/(b*c - a*d)])/(b*g) + ((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2
])^2*Log[a*g + b*g*x])/(b*g) + (4*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*
g + b*g*x])/(b*g) - (4*B^2*(Log[(a + b*x)^2] + Log[(c + d*x)^(-2)] - Log[(e
*(a + b*x)^2)/(c + d*x)^2])*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]
)/(b*g) - (2*B^2*Log[(e*(a + b*x)^2)/(c + d*x)^2]*Log[a*g + b*g*x]^2)/(b*g)
 - (4*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g) + (4*A*B
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (4*B^2*Log[(a + b*x)^2]*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (4*B^2*(Log[(a + b*x)^2]
+ Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*PolyLog[2, -((d*(
a + b*x))/(b*c - a*d))])/(b*g) - (4*B^2*Log[(c + d*x)^(-2)]*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/(b*g) - (8*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*
d))])/(b*g) - (8*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
```

```
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\left(A+B\log\left(\right.\right.}{e(a+bx)^2}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\left(A+B\log\left(\right.\right.}{(a+bx)^2}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{2(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bg}{(a+bx)(c+dx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int\left(\frac{d\left(-A-B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag}{(bc-ad)(c+dx)}\right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} - $$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int\left(\frac{A\log(ag+bgx)}{a+bx}+\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\log(ag}{a+bx}\right.}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4AB)\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{\left(4B^2\right)\int \frac{\log\left(\frac{e(a+}{(c+}\right.}{}}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} + \frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{2B^2}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} + \frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{4B^2}{}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log(g(a+bx))\log\left((a+bx)^2\right)\log(-c-dx)}{bg} - \frac{B^2}{}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log(g(a+bx))\log\left((a+bx)^2\right)\log(-c-dx)}{bg} + \frac{B^2}{}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log^3(g(a+bx))}{3bg} - \frac{4B^2\log^2(g(a+bx))\log(-c-dx}{bg}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log^3(g(a+bx))}{3bg} - \frac{4B^2\log^2(g(a+bx))\log(-c-dx}{bg}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log^3(g(a+bx))}{3bg} - \frac{4B^2\log^2(g(a+bx))\log(-c-dx}{bg}$$

Mathematica [**A**] time = 0.32, size = 257, normalized size = 1.95

$$\frac{A^2\log(a+bx)+2AB\log(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)-4AB\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+4AB\log(a+bx)\log\left(\frac{c}{d}+x\right)-4AB\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (2*A*B*Log[a/b + x]^2 + A^2*Log[a + b*x] - 4*A*B*Log[a/b + x]*Log[a + b*x]
+ 4*A*B*Log[c/d + x]*Log[a + b*x] - 4*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(-
(b*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(a + b*x)^2)/(c + d*x)^2] - B^2*L
og[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x)^2)/(c + d*x)^2]^2 - 4*A*B
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 4*B^2*Log[(e*(a + b*x)^2)/(c + d*x
)^2]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 8*B^2*PolyLog[3, (b*(c + d*x
))/(d*(a + b*x))])/(b*g)
```

fricas [**F**] time = 2.02, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(b*g*x + a*g), x)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(b*g*x + a*g), x)
```

maple [**F**] time = 0.98, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(b*g*x+a*g),x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(b*g*x+a*g),x)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\,B^2\log(bx+a)\log(dx+c)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2\,ABbc\log(e)+4\left(B^2bdx+B^2bc\right)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x, algorithm="maxi
ma")
```

```
[Out] 4*B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - inte
grate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + 4*(B^2*b*d*x + B^2*b*c)*log(b
*x + a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) - 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x + 2*(2*B^2*b*d*x + (b*c + a*d)*B^2)*l
og(b*x + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x),
 x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(a*g + b*g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^{2}}{a+bx}\, dx + \int \frac{B^{2} \log{\left(\frac{a^{2} e}{c^{2}+2cdx+d^{2} x^{2}} + \frac{2abex}{c^{2}+2cdx+d^{2} x^{2}} + \frac{b^{2} e x^{2}}{c^{2}+2cdx+d^{2} x^{2}} \right)}^{2}}{a+bx}\, dx + \int \frac{2AB \log{\left(\frac{a^{2} e}{c^{2}+2cdx+d^{2} x^{2}} + \frac{2abex}{c^{2}+2cdx+d^{2} x^{2}} + \frac{b^{2} e x^{2}}{c^{2}+2cdx+d^{2} x^{2}} \right)}}{a+bx}\, dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g),x)
```

```
[Out] (Integral(A**2/(a + b*x), x) + Integral(B**2*log(a**2*e/(c**2 + 2*c*d*x + d
**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*
c*d*x + d**2*x**2))**2/(a + b*x), x) + Integral(2*A*B*log(a**2*e/(c**2 + 2*
c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(
c**2 + 2*c*d*x + d**2*x**2))/(a + b*x), x))/g
```

3.133 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=130

$$-\frac{4B(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}-\frac{8B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] -8*B^2*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)-4*B*(d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+
c)^2))/(-a*d+b*c)/g^2/(b*x+a)-(d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a
*d+b*c)/g^2/(b*x+a)
```

Rubi [C] time = 0.89, antiderivative size = 480, normalized size of antiderivative = 3.69, number of steps used = 26, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{8B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{4Bd\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg^2(bc-ad)}-\frac{4B\left(B\log\left(\right.\right.}{bg^2(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-8*B^2)/(b*g^2*(a + b*x)) - (8*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
4*B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) - (4*B*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2]))/(b*g^2*(a + b*x)) - (4*B*d*Log[a + b*x]*(A + B*Log[(e*(a
+ b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(a + b*x)^2)/(
c + d*x)^2])^2/(b*g^2*(a + b*x)) + (8*B^2*d*Log[c + d*x])/(b*(b*c - a*d)*g^
2) - (8*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d
)*g^2) + (4*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*(
b*c - a*d)*g^2) + (4*B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (8*B^2*d*L
og[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) - (8*B^2*d*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (8*B^2*d*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
```

```
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.}{(bc-ad)^2(a+b}\right.}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(4Bd)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.}{a+bx}}{(bc-ad)g^2}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\right.}{b}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\right.}{b}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\right.}{b}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+}{}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+}{}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+}{(c+d}\right.\right.}{bg^2(a+bx)}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+}{(c+d}\right.\right.}{bg^2(a+bx)}$$

Mathematica [C] time = 0.43, size = 321, normalized size = 2.47

$$-\frac{4B\left((bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+d(a+bx)\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-d(a+bx)\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-Bd(a+bx)\left(\log(a+bx)\left(\log(a+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (4*B*((b*c - a*d)*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]) + d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2]) - d*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)
```

```
*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a
+ b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

fricas [A] time = 0.76, size = 200, normalized size = 1.54

$$-\frac{\left(A^{2}+4\,AB+8\,B^{2}\right)bc-\left(A^{2}+4\,AB+8\,B^{2}\right)ad+\left(B^{2}bdx+B^{2}bc\right)\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\left(\left(AB+2\,B^{2}\right)bdx+\left(\right.\right.}{\left(b^{3}c-ab^{2}d\right)g^{2}x+\left(ab^{2}c-a^{2}bd\right)g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x, algorithm="fr
icas")
```

```
[Out] -((A^2 + 4*A*B + 8*B^2)*b*c - (A^2 + 4*A*B + 8*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(
(A*B + 2*B^2)*b*d*x + (A*B + 2*B^2)*b*c)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e
)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d
)*g^2)
```

giac [B] time = 1.74, size = 378, normalized size = 2.91

$$-\left(\frac{B^{2}d}{b^{2}cg^{2}-abdg^{2}}+\frac{B^{2}}{\left(bgx+ag\right)bg}\right)\log\left(\frac{b^{2}}{\frac{b^{2}c^{2}g^{2}}{\left(bgx+ag\right)^{2}}-\frac{2\,abcdg^{2}}{\left(bgx+ag\right)^{2}}+\frac{a^{2}d^{2}g^{2}}{\left(bgx+ag\right)^{2}}+\frac{2\,bcdg}{bgx+ag}-\frac{2\,ad^{2}g}{bgx+ag}+d^{2}}\right)^{2}+\frac{4\left(ABd+3\,B^{2}c\right.}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x, algorithm="gi
ac")
```

```
[Out] -(B^2*d/(b^2*c*g^2 - a*b*d*g^2) + B^2/((b*g*x + a*g)*b*g))*log(b^2/(b^2*c^2
*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x +
 a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))^2 + 4*(
A*B*d + 3*B^2*d)*log(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x + a*g) + d)/(b^2*c*
g^2 - a*b*d*g^2) - 2*(A*B + 3*B^2)*log(b^2/(b^2*c^2*g^2/(b*g*x + a*g)^2 - 2
*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*g/(b*g
*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))/((b*g*x + a*g)*b*g) - (A^2 + 6*
A*B + 13*B^2)/((b*g*x + a*g)*b*g)
```

maple [B] time = 0.10, size = 357, normalized size = 2.75

$$\frac{B^{2}d\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}e}{d^{2}}\right)^{2}}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)\left(ad-bc\right)g^{2}}+\frac{2ABd\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}e}{d^{2}}\right)}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)\left(ad-bc\right)g^{2}}+\frac{4B^{2}d\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{2}e}{d^{2}}\right)}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)\left(ad-bc\right)g^{2}}+\frac{A^{2}d}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(b*g*x+a*g)^2,x)
```

```
[Out] d/g^2*A^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)/(a*d-b*c)-8*d/g^2/(1/(d*x+c)*a*d-
1/(d*x+c)*b*c+b)*B^2/b/(d*x+c)+4*d/g^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*B^2/
(a*d-b*c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+d/g^2/(1/(d*x+c)*a*d-
1/(d*x+c)*b*c+b)*B^2/(a*d-b*c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^
2-4*d/g^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*A*B/b/(d*x+c)+2*d/g^2/(1/(d*x+c)*
```

```
a*d-1/(d*x+c)*b*c+b)*A*B/(a*d-b*c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2
*e)
```

maxima [B] time = 1.59, size = 574, normalized size = 4.42

$$-4\left(\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{\left(b^2c-abd\right)g^2}-\frac{d\log(dx+c)}{\left(b^2c-abd\right)g^2}\right)\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2}{d^2x^2+2\,c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x, algorithm="ma
xima")
```

```
[Out] -4*((1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log
(d*x + c)/((b^2*c - a*b*d)*g^2))*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) +
2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - ((
b*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d
- 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a
))*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))
*B^2 - 2*A*B*(log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2
+ 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^2*g^2*x + a*b*g^2) +
 2/(b^2*g^2*x + a*b*g^2) + 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - 2*d*log
(d*x + c)/((b^2*c - a*b*d)*g^2)) - B^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
)^2/(b^2*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

mupad [B] time = 5.97, size = 228, normalized size = 1.75

$$-\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)^2\left(\frac{B^2}{b^2\,g^2\,\left(x+\frac{a}{b}\right)}-\frac{B^2\,d}{b\,g^2\,(a\,d-b\,c)}\right)-\frac{A^2+4\,A\,B+8\,B^2}{x\,b^2\,g^2+a\,b\,g^2}-\frac{\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\left(\frac{4\,B^2}{b^2\,d\,g^2}+\frac{2\,A\,B}{b^2\,d\,g^2}\right)}{\frac{x}{d}+\frac{a}{b\,d}}-\frac{B\,d\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(a*g + b*g*x)^2,x)
```

```
[Out] - log((e*(a + b*x)^2)/(c + d*x)^2)^2*(B^2/(b^2*g^2*(x + a/b)) - (B^2*d)/(b*
g^2*(a*d - b*c))) - (A^2 + 8*B^2 + 4*A*B)/(b^2*g^2*x + a*b*g^2) - (log((e*(
a + b*x)^2)/(c + d*x)^2)*((4*B^2)/(b^2*d*g^2) + (2*A*B)/(b^2*d*g^2)))/(x/d
+ a/(b*d)) - (B*d*atan(((2*b*d*x + (b^2*c*g^2 + a*b*d*g^2)/(b*g^2))*1i)/(a*
d - b*c))*(A + 2*B)*8i)/(b*g^2*(a*d - b*c))
```

sympy [B] time = 3.66, size = 454, normalized size = 3.49

$$-\frac{4Bd\,(A+2B)\log\left(x+\frac{4ABad^2+4ABbcd+8B^2ad^2+8B^2bcd-\frac{4Ba^2d^3(A+2B)}{ad-bc}+\frac{8Babcd^2(A+2B)}{ad-bc}-\frac{4Bb^2c^2d(A+2B)}{ad-bc}}{8ABbd^2+16B^2bd^2}\right)}{bg^2\,(ad-bc)}+\frac{4Bd\,(A+2B)\log\left(x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**2,x)
```

```
[Out] -4*B*d*(A + 2*B)*log(x + (4*A*B*a*d**2 + 4*A*B*b*c*d + 8*B**2*a*d**2 + 8*B*
*2*b*c*d - 4*B*a**2*d**3*(A + 2*B)/(a*d - b*c) + 8*B*a*b*c*d**2*(A + 2*B)/(
a*d - b*c) - 4*B*b**2*c**2*d*(A + 2*B)/(a*d - b*c))/(8*A*B*b*d**2 + 16*B**2
*b*d**2))/(b*g**2*(a*d - b*c)) + 4*B*d*(A + 2*B)*log(x + (4*A*B*a*d**2 + 4*
A*B*b*c*d + 8*B**2*a*d**2 + 8*B**2*b*c*d + 4*B*a**2*d**3*(A + 2*B)/(a*d - b
*c) - 8*B*a*b*c*d**2*(A + 2*B)/(a*d - b*c) + 4*B*b**2*c**2*d*(A + 2*B)/(a*d
```

```
 - b*c))/(8*A*B*b*d**2 + 16*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B -
4*B**2)*log(e*(a + b*x)**2/(c + d*x)**2)/(a*b*g**2 + b**2*g**2*x) + (B**2*c
 + B**2*d*x)*log(e*(a + b*x)**2/(c + d*x)**2)**2/(a**2*d*g**2 - a*b*c*g**2
+ a*b*d*g**2*x - b**2*c*g**2*x) + (-A**2 - 4*A*B - 8*B**2)/(a*b*g**2 + b**2
*g**2*x)
```

3.134 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=272

$$-\frac{bB(c+dx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^3(a+bx)^2(bc-ad)^2}+\frac{4Bd(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^3(a+bx)(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+$$

```
[Out] 8*B^2*d*(d*x+c)/(-a*d+b*c)^2/g^3/(b*x+a)-b*B^2*(d*x+c)^2/(-a*d+b*c)^2/g^3/(
b*x+a)^2+4*B*d*(d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^2/g^3/(b*
x+a)-b*B*(d*x+c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^2/g^3/(b*x+a)
^2+d*(d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^2/g^3/(b*x+a)-1/2
*b*(d*x+c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^2/g^3/(b*x+a)^2
```

Rubi [C] time = 1.05, antiderivative size = 579, normalized size of antiderivative = 2.13, number of steps used = 30, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.324$, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{4B^2d^2\mathrm{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{4B^2d^2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{2Bd^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg^3(bc-ad)^2}-2Bd^2\log($$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -(B^2/(b*g^3*(a + b*x)^2)) + (6*B^2*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (6*B
^2*d^2*Log[a + b*x])/(b*(b*c - a*d)^2*g^3) - (2*B^2*d^2*Log[a + b*x]^2)/(b*
(b*c - a*d)^2*g^3) - (B*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*g^3*(a
 + b*x)^2) + (2*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d
)*g^3*(a + b*x)) + (2*B*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]))/(b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/
(2*b*g^3*(a + b*x)^2) - (6*B^2*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) + (4
*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*g
^3) - (2*B*d^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*(b
*c - a*d)^2*g^3) - (2*B^2*d^2*Log[c + d*x]^2)/(b*(b*c - a*d)^2*g^3) + (4*B^
2*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) +
(4*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3)
+ (4*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.}{(bc-ad)^2(a+b}\right.}{b}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(2Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx}{(c+dx)}\right.}{a+bx}}{(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{2Bd^2\log(a+bx)\left(\right.}{b(bc-}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{2Bd^2\log(a+bx)\left(\right.}{b(bc-}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{2Bd^2\log(a+bx)\left(\right.}{b(bc-}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e}{(}\right.\right.}{bg^3(a+b}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e}{(}\right.\right.}{bg^3(a+b}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+}{b(bc-ad)^2g}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+}{b(bc-ad)^2g}$$

Mathematica [C] time = 0.44, size = 451, normalized size = 1.66

$$-\frac{\frac{2B\left(-2d^2(a+bx)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+2d^2(a+bx)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+(bc-ad)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+2d(a+bx)(ad-bc)\left(\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -1/2*((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*((b*c - a*d)^2*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d*(-(b*c) + a*d)*(a + b*x)*(A + B*
Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 2*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*L
og[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x
```

```
)^2)/(c + d*x)^2])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*
Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) +
 a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c
+ d*x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d
*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*
(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d
*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(b*g^3*(a +
 b*x)^2)
```

fricas [A] time = 0.66, size = 410, normalized size = 1.51

$$-\frac{\left(A^2+2\,AB+2\,B^2\right)b^2c^2-2\left(A^2+4\,AB+8\,B^2\right)abcd+\left(A^2+6\,AB+14\,B^2\right)a^2d^2-\left(B^2b^2d^2x^2+2\,B^2abd^2x-B^2\right.}{2\left(\left(b^5\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/2*((A^2 + 2*A*B + 2*B^2)*b^2*c^2 - 2*(A^2 + 4*A*B + 8*B^2)*a*b*c*d + (A^
2 + 6*A*B + 14*B^2)*a^2*d^2 - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b^2*
c^2 + 2*B^2*a*b*c*d)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
 + c^2))^2 - 4*((A*B + 3*B^2)*b^2*c*d - (A*B + 3*B^2)*a*b*d^2)*x - 2*((A*B
+ 3*B^2)*b^2*d^2*x^2 - (A*B + B^2)*b^2*c^2 + 2*(A*B + 2*B^2)*a*b*c*d + 2*(B
^2*b^2*c*d + (A*B + 2*B^2)*a*b*d^2)*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/
(d^2*x^2 + 2*c*d*x + c^2)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2
+ 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*
b^2*c*d + a^4*b*d^2)*g^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(b*g*x + a*g)^3, x)
```

maple [B] time = 0.15, size = 815, normalized size = 3.00

$$\frac{B^2b\,d^2\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2e}{d^2}\right)^2}{2\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\left(a^2d^2-2abcd+b^2c^2\right)g^3}+\frac{ABb\,d^2\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2e}{d^2}\right)}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\left(a^2d^2-2abcd+b^2c^2\right)g^3}+\frac{3B^2b\,d^2\ln}{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(b*g*x+a*g)^3,x)
```

```
[Out] d^2/g^3*A^2/(a*d-b*c)^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-1/2*d^2/g^3*A^2*b/(
a*d-b*c)^2/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2-7*d^2/g^3/(1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)^2*B^2/b/(d*x+c)^2+3*d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*b
*B^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e
)-6*d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*B^2/(a*d-b*c)/(d*x+c)+4*d^2/g
^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*B^2/(a*d-b*c)/(d*x+c)*ln((1/(d*x+c)*a*
```

```
d-1/(d*x+c)*b*c+b)^2/d^2*e)+1/2*d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*B
^2*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e
)^2+d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*B^2/(a*d-b*c)/(d*x+c)*ln((1/(
d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^2-3*d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^2*A*B/b/(d*x+c)^2+d^2/g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*b*A*B/(a^
2*d^2-2*a*b*c*d+b^2*c^2)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)-2*d^2/
g^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2*A*B/(a*d-b*c)/(d*x+c)+2*d^2/g^3/(1/(d
*x+c)*a*d-1/(d*x+c)*b*c+b)^2*A*B/(a*d-b*c)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x
+c)*b*c+b)^2/d^2*e)
```

maxima [B] time = 1.94, size = 1001, normalized size = 3.68

$$\Bigg(\Bigg(\frac{2\,bdx-bc+3\,ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}+\frac{2\,d^2\log\left(bx+a\right)}{\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)g^3}-\frac{2\,d^2\log(a}{(b^3c^2-2\,ab^2cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x, algorithm="ma
xima")
```

```
[Out] (((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2
*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a
*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a
^2*b*d^2)*g^3))*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^
2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - (b^2*c^2 - 8*a*b*c*
d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*
(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2
)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x
^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(
b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^
3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^
3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 + A*B*((2*b*d*x - b*c + 3*
a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*
c - a^3*b*d)*g^3) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^
2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*g^3*x^2 + 2*
a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2
*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)
) - 1/2*B^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 +
2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))^2/(b^3*g^3*x^2 + 2*a*b^2*
g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

mupad [B] time = 5.89, size = 503, normalized size = 1.85

$$-\frac{\frac{A^2\,a\,d-A^2\,b\,c+14\,B^2\,a\,d-2\,B^2\,b\,c+6\,A\,B\,a\,d-2\,A\,B\,b\,c}{2\,\left(a\,d-b\,c\right)}+\frac{2\,x\,\left(3\,b\,d\,B^2+A\,b\,d\,B\right)}{a\,d-b\,c}}{a^2\,b\,g^3+2\,a\,b^2\,g^3\,x+b^3\,g^3\,x^2}-\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)^2\Bigg(\frac{B^2}{2\,b^2\,g^3\,\left(2\,a\,x+b\,x^2+\frac{a^2}{b}\right)}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(a*g + b*g*x)^3,x)
```

```
[Out] - ((A^2*a*d - A^2*b*c + 14*B^2*a*d - 2*B^2*b*c + 6*A*B*a*d - 2*A*B*b*c)/(2*
(a*d - b*c)) + (2*x*(3*B^2*b*d + A*B*b*d))/(a*d - b*c))/(a^2*b*g^3 + b^3*g^
3*x^2 + 2*a*b^2*g^3*x) - log((e*(a + b*x)^2)/(c + d*x)^2)^2*(B^2/(2*b^2*g^3
*(2*a*x + b*x^2 + a^2/b)) - (B^2*d^2)/(2*b*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c
*d))) - (log((e*(a + b*x)^2)/(c + d*x)^2)*((A*B)/(b^2*d*g^3) + (2*B^2*x*(a*
d - b*c))/(b*g^3*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)) + (B^2*d^2*((2*a^2*d^2 +
```

```
b^2*c^2 - 3*a*b*c*d)/(b*d^3) + (a*(a*d - b*c))/(b*d^2)))/(b*g^3*(a^2*d^2 +
b^2*c^2 - 2*a*b*c*d))))/((b*x^2)/d + a^2/(b*d) + (2*a*x)/d) - (B*d^2*atan((
B*d^2*(2*b*d*x - (b^3*c^2*g^3 - a^2*b*d^2*g^3)/(b*g^3*(a*d - b*c)))*(A + 3*
B)*2i)/((a*d - b*c)*(6*B^2*d^2 + 2*A*B*d^2)))*(A + 3*B)*4i)/(b*g^3*(a*d - b
*c)^2)
```

sympy [B] time = 6.24, size = 879, normalized size = 3.23

$$-\frac{2Bd^{2}\left(A+3B\right)\log{\left(x+\frac{2ABad^{3}+2ABbcd^{2}+6B^{2}ad^{3}+6B^{2}bcd^{2}-\frac{2Ba^{3}d^{5}(A+3B)}{(ad-bc)^{2}}+\frac{6Ba^{2}bcd^{4}(A+3B)}{(ad-bc)^{2}}-\frac{6Bab^{2}c^{2}d^{3}(A+3B)}{(ad-bc)^{2}}+\frac{2Bb^{3}c^{3}d^{2}(A+3B)}{(ad-bc)^{2}}}{4ABbd^{3}+12B^{2}bd^{3}}\right)}}{bg^{3}\left(ad-bc\right)^{2}}+\frac{2Bd^{2}\,(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**3,x)
```

```
[Out] -2*B*d**2*(A + 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 + 6*B**2*a*d**3
+ 6*B**2*b*c*d**2 - 2*B*a**3*d**5*(A + 3*B)/(a*d - b*c)**2 + 6*B*a**2*b*c*d
**4*(A + 3*B)/(a*d - b*c)**2 - 6*B*a*b**2*c**2*d**3*(A + 3*B)/(a*d - b*c)**
2 + 2*B*b**3*c**3*d**2*(A + 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 + 12*B**2*b*
d**3))/(b*g**3*(a*d - b*c)**2) + 2*B*d**2*(A + 3*B)*log(x + (2*A*B*a*d**3 +
 2*A*B*b*c*d**2 + 6*B**2*a*d**3 + 6*B**2*b*c*d**2 + 2*B*a**3*d**5*(A + 3*B)
/(a*d - b*c)**2 - 6*B*a**2*b*c*d**4*(A + 3*B)/(a*d - b*c)**2 + 6*B*a*b**2*c
**2*d**3*(A + 3*B)/(a*d - b*c)**2 - 2*B*b**3*c**3*d**2*(A + 3*B)/(a*d - b*c
)**2)/(4*A*B*b*d**3 + 12*B**2*b*d**3))/(b*g**3*(a*d - b*c)**2) + (2*B**2*a*
c*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(a + b*x)**2/
(c + d*x)**2)**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*g**3
*x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*g**3
*x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**3*x*
*2) + (-A*B*a*d + A*B*b*c - 3*B**2*a*d + B**2*b*c - 2*B**2*b*d*x)*log(e*(a
+ b*x)**2/(c + d*x)**2)/(a**3*b*d*g**3 - a**2*b**2*c*g**3 + 2*a**2*b**2*d*g
**3*x - 2*a*b**3*c*g**3*x + a*b**3*d*g**3*x**2 - b**4*c*g**3*x**2) + (-A**2
*a*d + A**2*b*c - 6*A*B*a*d + 2*A*B*b*c - 14*B**2*a*d + 2*B**2*b*c + x*(-4*
A*B*b*d - 12*B**2*b*d))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + x**2*(2*a*b
**3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4*a*b**3*c*g**3))
```

3.135 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=429

$$-\frac{b^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^3}-\frac{4b^2B(c+dx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{d^2(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g^4(a+bx)(bc-ad)^3}$$

```
[Out] -8*B^2*d^2*(d*x+c)/(-a*d+b*c)^3/g^4/(b*x+a)+2*b*B^2*d*(d*x+c)^2/(-a*d+b*c)^
3/g^4/(b*x+a)^2-8/27*b^2*B^2*(d*x+c)^3/(-a*d+b*c)^3/g^4/(b*x+a)^3-4*B*d^2*(
d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^3/g^4/(b*x+a)+2*b*B*d*(d*
x+c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^3/g^4/(b*x+a)^2-4/9*b^2*B
*(d*x+c)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^3/g^4/(b*x+a)^3-d^2*(
d*x+c)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^3/g^4/(b*x+a)+b*d*(d*x+
c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^3/g^4/(b*x+a)^2-1/3*b^2*(
d*x+c)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^3/g^4/(b*x+a)^3
```

Rubi [C] time = 1.23, antiderivative size = 692, normalized size of antiderivative = 1.61, number of steps used = 34, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.324$, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{8B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{4Bd^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3bg^4(bc-ad)^3}+4Bd^3\log$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-8*B^2)/(27*b*g^4*(a + b*x)^3) + (10*B^2*d)/(9*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (44*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (44*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (4*B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)
^3*g^4) - (4*B*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(9*b*g^4*(a + b*x)
^3) + (2*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*(b*c - a*d)*g^4
*(a + b*x)^2) - (4*B*d^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*(b*
c - a*d)^2*g^4*(a + b*x)) - (4*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x)^2)/(c +
d*x)^2])^2/(3*b*g^4*(a + b*x)^3) + (44*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*
d)^3*g^4) - (8*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b
*(b*c - a*d)^3*g^4) + (4*B*d^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log
[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (4*B^2*d^3*Log[c + d*x]^2)/(3*b*(b*c -
 a*d)^3*g^4) - (8*B^2*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b
*(b*c - a*d)^3*g^4) - (8*B^2*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(3*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.}{(bc-ad)^2(a+b}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^4}\,dx}{3g^4} - \frac{\left(4Bd^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{(c+dx)}\right.}{a+bx}}{3(bc-ad)^3g^4}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{9bg^4(a+bx)^3} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{4Bd^2\left(A+B\log\left(\right.\right.}{3b(bc-ad)^2g^4(}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{9bg^4(a+bx)^3} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{4Bd^2\left(A+B\log\left(\right.\right.}{3b(bc-ad)^2g^4(}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{9bg^4(a+bx)^3} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{4Bd^2\left(A+B\log\left(\right.\right.}{3b(bc-ad)^2g^4(}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

Mathematica [C] time = 0.64, size = 598, normalized size = 1.39

$$-\frac{\frac{2B\left(18d^3(a+bx)^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-18d^3(a+bx)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+18d^2(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+6(bc-\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -1/27*(9*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*(6*(b*c - a*d)^3
*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 9*d*(b*c - a*d)^2*(a + b*x)*(A
+ B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 18*d^2*(b*c - a*d)*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 18*d^3*(a + b*x)^3*Log[a + b*x]*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 18*d^3*(a + b*x)^3*(A + B*Log[(e*(a
+ b*x)^2)/(c + d*x)^2])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*
(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c
- a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] +
2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*
(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x]
- 6*d^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log
[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/
(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d
)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))
)/(b*c - a*d)^3)/(b*g^4*(a + b*x)^3)
```

fricas [A] time = 0.92, size = 719, normalized size = 1.68

$$-\frac{\left(9\,A^2+12\,AB+8\,B^2\right)b^3c^3-27\left(A^2+2\,AB+2\,B^2\right)ab^2c^2d+27\left(A^2+4\,AB+8\,B^2\right)a^2bcd^2-\left(9\,A^2+66\,AB+1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/27*((9*A^2 + 12*A*B + 8*B^2)*b^3*c^3 - 27*(A^2 + 2*A*B + 2*B^2)*a*b^2*c^
2*d + 27*(A^2 + 4*A*B + 8*B^2)*a^2*b*c*d^2 - (9*A^2 + 66*A*B + 170*B^2)*a^3
*d^3 + 12*((3*A*B + 11*B^2)*b^3*c*d^2 - (3*A*B + 11*B^2)*a*b^2*d^3)*x^2 + 9
*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)
/(d^2*x^2 + 2*c*d*x + c^2))^2 - 6*((3*A*B + 5*B^2)*b^3*c^2*d - 18*(A*B + 3*
B^2)*a*b^2*c*d^2 + (15*A*B + 49*B^2)*a^2*b*d^3)*x + 6*((3*A*B + 11*B^2)*b^3
*d^3*x^3 + (3*A*B + 2*B^2)*b^3*c^3 - 9*(A*B + B^2)*a*b^2*c^2*d + 9*(A*B + 2
*B^2)*a^2*b*c*d^2 + 3*(2*B^2*b^3*c*d^2 + 3*(A*B + 3*B^2)*a*b^2*d^3)*x^2 - 3
*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 3*(A*B + 2*B^2)*a^2*b*d^3)*x)*log((b^
2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^7*c^3 - 3*a*b^
6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5
*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^
4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c
^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{\left(bgx+ag\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(b*g*x + a*g)^4, x)
```

maple [B] time = 0.23, size = 1343, normalized size = 3.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(b*g*x+a*g)^4,x)
```

```
[Out] 1/3*d^3/g^4*A^2*b^2/(a*d-b*c)^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3+d^3/g^4*A
^2/(a*d-b*c)^3/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-d^3/g^4*A^2*b/(a*d-b*c)^3/(1
/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2-170/27*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c
+b)^3*B^2/b/(d*x+c)^3+22/9*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*b^2*B^
2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln((1/(d*x+c)*a*d-1/(d*x+c)
*b*c+b)^2/d^2*e)-44/9*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B^2*b/(a^2*
d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)-98/9*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)
^3*B^2/(a*d-b*c)/(d*x+c)^2+4*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B^2/
(a*d-b*c)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+1/3*d^3/g^4
/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c
^2*d-b^3*c^3)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^2+d^3/g^4/(1/(d*x
+c)*a*d-1/(d*x+c)*b*c+b)^3*B^2/(a*d-b*c)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x
+c)*b*c+b)^2/d^2*e)^2+6*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B^2*b/(a^
2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e
)+d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*B^2*b/(a^2*d^2-2*a*b*c*d+b^2*c^
2)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^2-22/9*d^3/g^4/(1/(d
*x+c)*a*d-1/(d*x+c)*b*c+b)^3*A*B/b/(d*x+c)^3+2/3*d^3/g^4/(1/(d*x+c)*a*d-1/(
d*x+c)*b*c+b)^3*b^2*A*B/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln((1
/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)-4/3*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)
*b*c+b)^3*A*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)-10/3*d^3/g^4/(1/(d*x+c)
*a*d-1/(d*x+c)*b*c+b)^3*A*B/(a*d-b*c)/(d*x+c)^2+2*d^3/g^4/(1/(d*x+c)*a*d-1/
(d*x+c)*b*c+b)^3*A*B/(a*d-b*c)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)
^2/d^2*e)+2*d^3/g^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3*A*B*b/(a^2*d^2-2*a*b*
c*d+b^2*c^2)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)
```

maxima [B] time = 2.67, size = 1575, normalized size = 3.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x, algorithm="ma
xima")
```

```
[Out] -2/27*(3*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
 - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c
^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d
 + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d
^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^
4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b
*d^3)*g^4))*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 +
2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + (4*b^3*c^3 - 27*a*b^2*c
^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(
b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 1
8*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2
 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a
*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 +
33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d
^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*
g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*
g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a
*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)
*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5
*b^2*d^3*g^4)*x))*B^2 - 2/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 1
1*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^
2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b
^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d
 + a^5*b*d^2)*g^4) + 3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(
d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^4*g^4*x^3 +
```

```
3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c
^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)
/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*l
og(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2
) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a
^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*
b^2*g^4*x + a^3*b*g^4)
```

mupad [B] time = 7.67, size = 1069, normalized size = 2.49

$$\frac{\frac{9\,A^2\,a^2\,d^2-18\,A^2\,a\,b\,c\,d+9\,A^2\,b^2\,c^2+66\,A\,B\,a^2\,d^2-42\,A\,B\,a\,b\,c\,d+12\,A\,B\,b^2\,c^2+170\,B^2\,a^2\,d^2-46\,B^2\,a\,b\,c\,d+8\,B^2\,b^2\,c^2}{3\,(a\,d-b\,c)}+\frac{2\,x\,(-5\,c\,B^2\,b^2\,d+49\,a\,B^2\,b\,d^2-3}{a\,d-b\,c}}{x\,\left(27\,a^2\,b^3\,c\,g^4-27\,a^3\,b^2\,d\,g^4\right)-x^2\,\left(27\,a^2\,b^3\,d\,g^4-27\,a\,b^4\,c\,g^4\right)+x^3\,\left(9\,b^5\,c\,g^4-9\,a\,b^4\,d\,g^4\right)+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(a*g + b*g*x)^4,x)
```

```
[Out] ((9*A^2*a^2*d^2 + 9*A^2*b^2*c^2 + 170*B^2*a^2*d^2 + 8*B^2*b^2*c^2 + 66*A*B*
a^2*d^2 + 12*A*B*b^2*c^2 - 18*A^2*a*b*c*d - 46*B^2*a*b*c*d - 42*A*B*a*b*c*d
)/(3*(a*d - b*c)) + (2*x*(49*B^2*a*b*d^2 - 5*B^2*b^2*c*d + 15*A*B*a*b*d^2 -
 3*A*B*b^2*c*d))/(a*d - b*c) + (4*d*x^2*(11*B^2*b^2*d + 3*A*B*b^2*d))/(a*d
- b*c))/(x*(27*a^2*b^3*c*g^4 - 27*a^3*b^2*d*g^4) - x^2*(27*a^2*b^3*d*g^4 -
27*a*b^4*c*g^4) + x^3*(9*b^5*c*g^4 - 9*a*b^4*d*g^4) + 9*a^3*b^2*c*g^4 - 9*a
^4*b*d*g^4) - log((e*(a + b*x)^2)/(c + d*x)^2)^2*(B^2/(3*b^2*g^4*(3*a^2*x +
 a^3/b + b^2*x^3 + 3*a*b*x^2)) - (B^2*d^3)/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*
a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (log((e*(a + b*x)^2)/(c + d*x)^2)*((2*A*B)
/(3*b^2*d*g^4) + (2*B^2*d^3*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*b*d^3)
 + (2*a*(a*d - b*c))/(3*b*d^2)) + (2*(3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d -
 6*a^2*b*c*d^2))/(3*b*d^4)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d -
3*a^2*b*c*d^2)) - (2*B^2*d^3*x^2*((2*(b^2*c - a*b*d))/(3*d^2) - (4*b*(a*d -
 b*c))/(3*d^2)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^
2)) + (2*B^2*d^3*x*(b*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*b*d^3) + (2*a*(
a*d - b*c))/(3*b*d^2)) + (2*(3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3) + (4
*a*(a*d - b*c))/(3*d^2)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a
^2*b*c*d^2))))/((3*a^2*x)/d + a^3/(b*d) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (B
*d^3*atan((B*d^3*((b^4*c^3*g^4 + a^3*b*d^3*g^4 - a*b^3*c^2*d*g^4 - a^2*b^2*
c*d^2*g^4)/(b^3*c^2*g^4 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4) + 2*b*d*x)*(3*A
+ 11*B)*(b^3*c^2*g^4 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4)*4i)/(b*g^4*(a*d - b
*c)^3*(44*B^2*d^3 + 12*A*B*d^3)))*(3*A + 11*B)*8i)/(9*b*g^4*(a*d - b*c)^3)
```

sympy [B] time = 34.03, size = 1561, normalized size = 3.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -4*B*d**3*(3*A + 11*B)*log(x + (12*A*B*a*d**4 + 12*A*B*b*c*d**3 + 44*B**2*a
*d**4 + 44*B**2*b*c*d**3 - 4*B*a**4*d**7*(3*A + 11*B)/(a*d - b*c)**3 + 16*B
*a**3*b*c*d**6*(3*A + 11*B)/(a*d - b*c)**3 - 24*B*a**2*b**2*c**2*d**5*(3*A
+ 11*B)/(a*d - b*c)**3 + 16*B*a*b**3*c**3*d**4*(3*A + 11*B)/(a*d - b*c)**3
- 4*B*b**4*c**4*d**3*(3*A + 11*B)/(a*d - b*c)**3)/(24*A*B*b*d**4 + 88*B**2*
b*d**4))/(9*b*g**4*(a*d - b*c)**3) + 4*B*d**3*(3*A + 11*B)*log(x + (12*A*B*
a*d**4 + 12*A*B*b*c*d**3 + 44*B**2*a*d**4 + 44*B**2*b*c*d**3 + 4*B*a**4*d**
7*(3*A + 11*B)/(a*d - b*c)**3 - 16*B*a**3*b*c*d**6*(3*A + 11*B)/(a*d - b*c)
**3 + 24*B*a**2*b**2*c**2*d**5*(3*A + 11*B)/(a*d - b*c)**3 - 16*B*a*b**3*c*
*3*d**4*(3*A + 11*B)/(a*d - b*c)**3 + 4*B*b**4*c**4*d**3*(3*A + 11*B)/(a*d
```

```
- b*c)**3)/(24*A*B*b*d**4 + 88*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3
*B**2*a**2*c*d**2 + 3*B**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**
3*x**2 + B**2*b**2*c**3 + B**2*b**2*d**3*x**3)*log(e*(a + b*x)**2/(c + d*x)
**2)**2/(3*a**6*d**3*g**4 - 9*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9
*a**4*b**2*c**2*d*g**4 - 27*a**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4
*x**2 - 3*a**3*b**3*c**3*g**4 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c
*d**2*g**4*x**2 + 3*a**3*b**3*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27
*a**2*b**4*c**2*d*g**4*x**2 - 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*
g**4*x**2 + 9*a*b**5*c**2*d*g**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a*
*2*d**2 + 12*A*B*a*b*c*d - 6*A*B*b**2*c**2 - 22*B**2*a**2*d**2 + 14*B**2*a*
b*c*d - 30*B**2*a*b*d**2*x - 4*B**2*b**2*c**2 + 6*B**2*b**2*c*d*x - 12*B**2
*b**2*d**2*x**2)*log(e*(a + b*x)**2/(c + d*x)**2)/(9*a**5*b*d**2*g**4 - 18*
a**4*b**2*c*d*g**4 + 27*a**4*b**2*d**2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*
a**3*b**3*c*d*g**4*x + 27*a**3*b**3*d**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4
*x - 54*a**2*b**4*c*d*g**4*x**2 + 9*a**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c*
*2*g**4*x**2 - 18*a*b**5*c*d*g**4*x**3 + 9*b**6*c**2*g**4*x**3) - (9*A**2*a
**2*d**2 - 18*A**2*a*b*c*d + 9*A**2*b**2*c**2 + 66*A*B*a**2*d**2 - 42*A*B*a
*b*c*d + 12*A*B*b**2*c**2 + 170*B**2*a**2*d**2 - 46*B**2*a*b*c*d + 8*B**2*b
**2*c**2 + x**2*(36*A*B*b**2*d**2 + 132*B**2*b**2*d**2) + x*(90*A*B*a*b*d**
2 - 18*A*B*b**2*c*d + 294*B**2*a*b*d**2 - 30*B**2*b**2*c*d))/(27*a**5*b*d**
2*g**4 - 54*a**4*b**2*c*d*g**4 + 27*a**3*b**3*c**2*g**4 + x**3*(27*a**2*b**
4*d**2*g**4 - 54*a*b**5*c*d*g**4 + 27*b**6*c**2*g**4) + x**2*(81*a**3*b**3*
d**2*g**4 - 162*a**2*b**4*c*d*g**4 + 81*a*b**5*c**2*g**4) + x*(81*a**4*b**2
*d**2*g**4 - 162*a**3*b**3*c*d*g**4 + 81*a**2*b**4*c**2*g**4))
```

3.136 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=587

$$-\frac{b^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^4}-\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+dx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g^5(a+bx)^3(bc-ad)^4}+$$

```
[Out] 8*B^2*d^3*(d*x+c)/(-a*d+b*c)^4/g^5/(b*x+a)-3*b*B^2*d^2*(d*x+c)^2/(-a*d+b*c)
^4/g^5/(b*x+a)^2+8/9*b^2*B^2*d*(d*x+c)^3/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/8*b^3
*B^2*(d*x+c)^4/(-a*d+b*c)^4/g^5/(b*x+a)^4+4*B*d^3*(d*x+c)*(A+B*ln(e*(b*x+a)
^2/(d*x+c)^2))/(-a*d+b*c)^4/g^5/(b*x+a)-3*b*B*d^2*(d*x+c)^2*(A+B*ln(e*(b*x+
a)^2/(d*x+c)^2))/(-a*d+b*c)^4/g^5/(b*x+a)^2+4/3*b^2*B*d*(d*x+c)^3*(A+B*ln(e
*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/4*b^3*B*(d*x+c)^4*(A+B*
ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*d+b*c)^4/g^5/(b*x+a)^4+d^3*(d*x+c)*(A+B*ln(e
*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^4/g^5/(b*x+a)-3/2*b*d^2*(d*x+c)^2*(A+B*
ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^4/g^5/(b*x+a)^2+b^2*d*(d*x+c)^3*(A+
B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/4*b^3*(d*x+c)^4
*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*d+b*c)^4/g^5/(b*x+a)^4
```

Rubi **[C]** time = 1.39, antiderivative size = 757, normalized size of antiderivative = 1.29, number of steps used = 38, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^5(bc-ad)^4}+\frac{2B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^5(bc-ad)^4}+\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg^5(bc-ad)^4}-\frac{Bd^4\log(c+d}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(8*b*g^5*(a + b*x)^4) + (7*B^2*d)/(18*b*(b*c - a*d)*g^5*(a + b*x)^3) -
 (13*B^2*d^2)/(12*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(6*b*(b*c
 - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(6*b*(b*c - a*d)^4*g^5
) - (B^2*d^4*Log[a + b*x]^2)/(b*(b*c - a*d)^4*g^5) - (B*(A + B*Log[(e*(a +
b*x)^2)/(c + d*x)^2]))/(4*b*g^5*(a + b*x)^4) + (B*d*(A + B*Log[(e*(a + b*x)
^2)/(c + d*x)^2]))/(3*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2*(A + B*Log[(e
*(a + b*x)^2)/(c + d*x)^2]))/(2*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d)^3*g^5*(a + b*x)) +
(B*d^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d
)^4*g^5) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(4*b*g^5*(a + b*x)^4)
 - (25*B^2*d^4*Log[c + d*x])/(6*b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*Log[-((d*
(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^4*g^5) - (B*d^4*(A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*(b*c - a*d)^4*g^5) - (
B^2*d^4*Log[c + d*x]^2)/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int\frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^5(c+dx)}\,dx}{bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^5}-\frac{bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)^2(a+bx)^4}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^5}\,dx}{g^5}+\frac{\left(Bd^4\right)\int\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{(bc-ad)^4g^5}-$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4bg^5(a+bx)^4}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{2b(bc-ad)^2g^5(a+bx)}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4bg^5(a+bx)^4}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{2b(bc-ad)^2g^5(a+bx)}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4bg^5(a+bx)^4}+\frac{Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{2b(bc-ad)^2g^5(a+bx)}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

Mathematica [C] time = 0.94, size = 762, normalized size = 1.30

$$-\frac{\frac{B\left(-72d^4(a+bx)^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+72d^4(a+bx)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+72d^3(a+bx)^3(ad-bc)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+36d^2(a+b\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -1/72*(18*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (B*(18*(b*c - a*d)^4
*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 24*d*(-(b*c) + a*d)^3*(a + b*x)
*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 36*d^2*(b*c - a*d)^2*(a + b*x)^
2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 72*d^3*(-(b*c) + a*d)*(a + b*x
)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 72*d^4*(a + b*x)^4*Log[a + b
*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 72*d^4*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c -
 a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a +
 b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*L
og[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a
*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3
*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*(b*c -
 a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2
+ 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*
d^4*(a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a +
 b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
 Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b
*c - a*d)^4)/(b*g^5*(a + b*x)^4)
```

fricas [A] time = 1.03, size = 1084, normalized size = 1.85

$$-\frac{9\left(2A^{2}+2AB+B^{2}\right)b^{4}c^{4}-8\left(9A^{2}+12AB+8B^{2}\right)ab^{3}c^{3}d+108\left(A^{2}+2AB+2B^{2}\right)a^{2}b^{2}c^{2}d^{2}-72\,(A^{2}+4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/72*(9*(2*A^2 + 2*A*B + B^2)*b^4*c^4 - 8*(9*A^2 + 12*A*B + 8*B^2)*a*b^3*c
^3*d + 108*(A^2 + 2*A*B + 2*B^2)*a^2*b^2*c^2*d^2 - 72*(A^2 + 4*A*B + 8*B^2)
*a^3*b*c*d^3 + (18*A^2 + 150*A*B + 415*B^2)*a^4*d^4 - 12*((6*A*B + 25*B^2)*
b^4*c*d^3 - (6*A*B + 25*B^2)*a*b^3*d^4)*x^3 + 6*((6*A*B + 13*B^2)*b^4*c^2*d
^2 - 16*(3*A*B + 11*B^2)*a*b^3*c*d^3 + (42*A*B + 163*B^2)*a^2*b^2*d^4)*x^2
- 18*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 + 4*B^2
*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*
B^2*a^3*b*c*d^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c
^2))^2 - 4*((6*A*B + 7*B^2)*b^4*c^3*d - 12*(3*A*B + 5*B^2)*a*b^3*c^2*d^2 +
108*(A*B + 3*B^2)*a^2*b^2*c*d^3 - (78*A*B + 271*B^2)*a^3*b*d^4)*x - 6*((6*A
*B + 25*B^2)*b^4*d^4*x^4 - 3*(2*A*B + B^2)*b^4*c^4 + 8*(3*A*B + 2*B^2)*a*b^
3*c^3*d - 36*(A*B + B^2)*a^2*b^2*c^2*d^2 + 24*(A*B + 2*B^2)*a^3*b*c*d^3 + 4
*(3*B^2*b^4*c*d^3 + 2*(3*A*B + 11*B^2)*a*b^3*d^4)*x^3 - 6*(B^2*b^4*c^2*d^2
- 8*B^2*a*b^3*c*d^3 - 6*(A*B + 3*B^2)*a^2*b^2*d^4)*x^2 + 4*(B^2*b^4*c^3*d -
 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 + 6*(A*B + 2*B^2)*a^3*b*d^4)*x)
*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^9*c^4
- 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^
4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 +
a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2
 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*
d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4
 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

giac [A] time = 3.18, size = 874, normalized size = 1.49

$$\frac{1}{4}\left(\frac{B^{2}d^{4}}{b^{5}c^{4}g^{5}-4\,ab^{4}c^{3}dg^{5}+6\,a^{2}b^{3}c^{2}d^{2}g^{5}-4\,a^{3}b^{2}cd^{3}g^{5}+a^{4}bd^{4}g^{5}}-\frac{B^{2}}{\left(bgx+ag\right)^{4}bg}\right)\log\left(\frac{}{\frac{b^{2}c^{2}g^{2}}{\left(bgx+ag\right)^{2}}-\frac{2\,abcdg^{2}}{\left(bgx+ag\right)^{2}}+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x, algorithm="gi
ac")
```

```
[Out] 1/4*(B^2*d^4/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a
^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) - B^2/((b*g*x + a*g)^4*b*g))*log(b^2/(b^2
*c^2*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g
*x + a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))^2 +
 1/12*(12*B^2*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a
^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 6*B^2*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a^2*
d^2*g)*(b*g*x + a*g)^2*b*g^2) + 4*B^2*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2)
 - 3*(2*A*B*b^3*g^3 + 3*B^2*b^3*g^3)/((b*g*x + a*g)^4*b^4*g^4))*log(b^2/(b^
2*c^2*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*
g*x + a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)) -
1/6*(6*A*B*d^4 + 31*B^2*d^4)*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g)
 - d)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*
c*d^3*g^5 + a^4*b*d^4*g^5) + 1/6*(6*A*B*d^3 + 31*B^2*d^3)/((b^3*c^3*g^3 - 3
*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 1/
12*(6*A*B*b*d^2 + 19*B^2*b*d^2)/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(b*g
*x + a*g)^2*b^2*g^2) + 1/18*(6*A*B*b^2*d*g + 13*B^2*b^2*d*g)/((b*g*x + a*g)
^3*(b*c - a*d)*b^3*g^3) - 1/8*(2*A^2*b^3*g^3 + 6*A*B*b^3*g^3 + 5*B^2*b^3*g^
3)/((b*g*x + a*g)^4*b^4*g^4)
```

maple [B] time = 0.34, size = 1943, normalized size = 3.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(b*g*x+a*g)^5,x)
```

```
[Out] d^4/g^5*A^2*b^2/(a*d-b*c)^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^3-1/4*d^4/g^5*A
^2*b^3/(a*d-b*c)^4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4+d^4/g^5*A^2/(a*d-b*c)^
4/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-3/2*d^4/g^5*A^2*b/(a*d-b*c)^4/(1/(d*x+c)*
a*d-1/(d*x+c)*b*c+b)^2-415/72*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2
/b/(d*x+c)^4+25/12*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*b^3*B^2/(a^4*d
^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln((1/(d*x+c)*a*d
-1/(d*x+c)*b*c+b)^2/d^2*e)-25/6*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B
^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)-163/12*d^4/g^5
/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c
)^2-271/18*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2/(a*d-b*c)/(d*x+c)^
3+4*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2/(a*d-b*c)/(d*x+c)^3*ln((1
/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+1/4*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)
*b*c+b)^4*B^2*b^3/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^
4*c^4)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^2+d^4/g^5/(1/(d*x+c)*a*d
-1/(d*x+c)*b*c+b)^4*B^2/(a*d-b*c)/(d*x+c)^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c
+b)^2/d^2*e)^2+9*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2*b/(a^2*d^2-2
*a*b*c*d+b^2*c^2)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+22/
3*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+
3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+
3/2*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2*b/(a^2*d^2-2*a*b*c*d+b^2*
c^2)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^2+d^4/g^5/(1/(d*
```

```
x+c)*a*d-1/(d*x+c)*b*c+b)^4*B^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^
3*c^3)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)^2-d^4/g^5/(1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)^4*A*B*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^
3*c^3)/(d*x+c)-25/12*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*A*B/b/(d*x+c
)^4+1/2*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*b^3*A*B/(a^4*d^4-4*a^3*b*
c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln((1/(d*x+c)*a*d-1/(d*x+c)*
b*c+b)^2/d^2*e)-7/2*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*A*B*b/(a^2*d^
2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2-13/3*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)
^4*A*B/(a*d-b*c)/(d*x+c)^3+2*d^4/g^5/(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*A*B/
(a*d-b*c)/(d*x+c)^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+3*d^4/g^5/(
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^4*A*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^
2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+2*d^4/g^5/(1/(d*x+c)*a*d-1/(d
*x+c)*b*c+b)^4*A*B*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c
)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)
```

maxima [B] time = 3.44, size = 2279, normalized size = 3.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x, algorithm="ma
xima")
```

```
[Out] 1/72*(6*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25
*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3
)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)
*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3
)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^
5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*
a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c
^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b^2*e*x^2
/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d
^2*x^2 + 2*c*d*x + c^2)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^
2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13
*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4
*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^
2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x +
 a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*
c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d
^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a
*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4
*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*l
og(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b
^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*b
^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g^
5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 - 4
*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6*
c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)*
x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4*
a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 + 1/12*A*B*((12*b^3*d^3*x^3 -
3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7
*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3
 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 -
3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 -
 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3
- 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3
*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 6*log(b^2*e*x^2/(d^2*x
^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2
```

```
+ 2*c*d*x + c^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^
3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d +
6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)
/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^
4)*g^5)) - 1/4*B^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2
*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))^2/(b^5*g^5*x^4 + 4
*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^2
/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4
*b*g^5)
```

mupad [**B**] time = 10.55, size = 1883, normalized size = 3.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(a*g + b*g*x)^5,x)
```

```
[Out] (B*d^4*atan((B*d^4*(6*A + 25*B)*(6*b^5*c^4*g^5 - 6*a^4*b*d^4*g^5 - 12*a*b^4
*c^3*d*g^5 + 12*a^3*b^2*c*d^3*g^5)*1i)/(6*b*g^5*(a*d - b*c)^4*(25*B^2*d^4 +
 6*A*B*d^4)) + (B*d^5*x*(6*A + 25*B)*(b^4*c^3*g^5 - a^3*b*d^3*g^5 - 3*a*b^3
*c^2*d*g^5 + 3*a^2*b^2*c*d^2*g^5)*2i)/(g^5*(a*d - b*c)^4*(25*B^2*d^4 + 6*A*
B*d^4)))*(6*A + 25*B)*1i)/(3*b*g^5*(a*d - b*c)^4) - log((e*(a + b*x)^2)/(c
+ d*x)^2)^2*(B^2/(4*b^2*g^5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*
b^2*x^3)) - (B^2*d^4)/(4*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a
*b^3*c^3*d - 4*a^3*b*c*d^3))) - (log((e*(a + b*x)^2)/(c + d*x)^2)*((A*B)/(2
*b^2*d*g^5) + (B^2*d^4*(a*(a*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*b*d^3) +
 (a*(a*d - b*c))/(2*b*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2
*b*c*d^2)/(6*b*d^4)) + (4*a^4*d^4 + b^4*c^4 + 10*a^2*b^2*c^2*d^2 - 5*a*b^3*
c^3*d - 10*a^3*b*c*d^3)/(2*b*d^5)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2
*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (B^2*d^4*x^2*(b*(b*((4*a^2*d^2
 + b^2*c^2 - 5*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)) + (4*a^2*d^2
 + b^2*c^2 - 5*a*b*c*d)/(3*d^3) + (a*(a*d - b*c))/d^2) - a*((b^2*c - a*b*d)
/(2*d^2) - (b*(a*d - b*c))/d^2) + (b^3*c^2 + 4*a^2*b*d^2 - 5*a*b^2*c*d)/(2*
d^3)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*
a^3*b*c*d^3)) - (B^2*d^4*x^3*(b*((b^2*c - a*b*d)/(2*d^2) - (b*(a*d - b*c))/
d^2) + (b^3*c - a*b^2*d)/(2*d^2)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*
c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (B^2*d^4*x*(b*(a*((4*a^2*d^2 +
b^2*c^2 - 5*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)) + (6*a^3*d^3 -
b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(6*b*d^4)) + a*(b*((4*a^2*d^2 + b
^2*c^2 - 5*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)) + (4*a^2*d^2 + b
^2*c^2 - 5*a*b*c*d)/(3*d^3) + (a*(a*d - b*c))/d^2) + (6*a^3*d^3 - b^3*c^3 +
 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(2*d^4)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*
a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))))/((4*a^3*x)/d + a^4/(b*d
) + (b^3*x^4)/d + (6*a^2*b*x^2)/d + (4*a*b^2*x^3)/d) - ((18*A^2*a^3*d^3 - 1
8*A^2*b^3*c^3 + 415*B^2*a^3*d^3 - 9*B^2*b^3*c^3 + 150*A*B*a^3*d^3 - 18*A*B*
b^3*c^3 + 54*A^2*a*b^2*c^2*d - 54*A^2*a^2*b*c*d^2 + 55*B^2*a*b^2*c^2*d - 16
1*B^2*a^2*b*c*d^2 + 78*A*B*a*b^2*c^2*d - 138*A*B*a^2*b*c*d^2)/(12*(a*d - b*
c)) + (x^2*(163*B^2*a*b^2*d^3 - 13*B^2*b^3*c*d^2 + 42*A*B*a*b^2*d^3 - 6*A*B
*b^3*c*d^2))/(2*(a*d - b*c)) + (x*(271*B^2*a^2*b*d^3 + 7*B^2*b^3*c^2*d - 53
*B^2*a*b^2*c*d^2 + 78*A*B*a^2*b*d^3 + 6*A*B*b^3*c^2*d - 30*A*B*a*b^2*c*d^2)
)/(3*(a*d - b*c)) + (d*x^3*(25*B^2*b^3*d^2 + 6*A*B*b^3*d^2))/(a*d - b*c))/(
x*(24*a^3*b^4*c^2*g^5 + 24*a^5*b^2*d^2*g^5 - 48*a^4*b^3*c*d*g^5) + x^3*(24*
a*b^6*c^2*g^5 + 24*a^3*b^4*d^2*g^5 - 48*a^2*b^5*c*d*g^5) + x^4*(6*b^7*c^2*g
^5 + 6*a^2*b^5*d^2*g^5 - 12*a*b^6*c*d*g^5) + x^2*(36*a^2*b^5*c^2*g^5 + 36*a
^4*b^3*d^2*g^5 - 72*a^3*b^4*c*d*g^5) + 6*a^6*b*d^2*g^5 + 6*a^4*b^3*c^2*g^5
- 12*a^5*b^2*c*d*g^5)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

3.137 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=37

$$\mathrm{Int}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x] + b^2*g^2*D
efer[Int][x^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+\left(b^2g^2\right)\int\end{aligned}$$

Mathematica [A] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((b^2*e*x^2 + 2*a*b*e*
x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) + A), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

maple [A] time = 0.80, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^2}{B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(a\,g + b\,g\,x\right)^2}{A + B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$g^2\left(\int \frac{a^2}{A + B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2} + \frac{2abex}{c^2+2cdx+d^2x^2} + \frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx + \int \frac{b^2x^2}{A + B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2} + \frac{2abex}{c^2+2cdx+d^2x^2} + \right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] g**2*(Integral(a**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*
e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)
)), x) + Integral(b**2*x**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2)
+ 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d*
*2*x**2))), x) + Integral(2*a*b*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*
x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*
x + d**2*x**2))), x))
```

3.138 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{ag+bgx}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\ &= (ag)\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

fricas [A] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] integral((b*g*x + a*g)/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*
c*d*x + c^2)) + A), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

maple [A] time = 0.63, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B \ln\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g + b\,g\,x}{A + B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int \frac{a}{A + B \log\left(\frac{a^2 e}{c^2+2cdx+d^2x^2} + \frac{2abex}{c^2+2cdx+d^2x^2} + \frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\, dx + \int \frac{bx}{A + B \log\left(\frac{a^2 e}{c^2+2cdx+d^2x^2} + \frac{2abex}{c^2+2cdx+d^2x^2} + \frac{b^2}{c^2+2cd}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] g*(Integral(a/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c
**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x)
 + Integral(b*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/
(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))),
x))
```

3.139 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=37

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

fricas [A] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((b^2*e*x^2 + 2*a*b*e*x
+ a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

maple [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa+Abx+Ba\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)+Bbx\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral(1/(A*a + A*b*x + B*a*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a
*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x*
*2)) + B*b*x*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*
c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x)/g
```

3.140 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=94

$$\frac{e^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\mathrm{Ei}\left(\frac{-A-B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{2Bg^2(a+bx)(bc-ad)}$$

```
[Out] 1/2*exp(1/2*A/B)*(d*x+c)*Ei(1/2*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/B)*(e*(b*x
+a)^2/(d*x+c)^2)^(1/2)/B/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

fricas [F] time = 0.91, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{Ab^2g^2x^2+2\,Aabg^2x+Aa^2g^2+\left(Bb^2g^2x^2+2\,Babg^2x+Ba^2g^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*
B*a*b*g^2*x + B*a^2*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c
*d*x + c^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

maple [F] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{2}+2Aabx+Ab^{2}x^{2}+Ba^{2}\log\left(\frac{a^{2}e}{c^{2}+2cdx+d^{2}x^{2}}+\frac{2abex}{c^{2}+2cdx+d^{2}x^{2}}+\frac{b^{2}ex^{2}}{c^{2}+2cdx+d^{2}x^{2}}\right)+2Babx\log\left(\frac{a^{2}e}{c^{2}+2cdx+d^{2}x^{2}}+\frac{2abex}{c^{2}+2cdx+d^{2}x^{2}}+\frac{b^{2}ex^{2}}{c^{2}+2cdx+d^{2}x^{2}}\right)+Bb^{2}x^{2}\log\Big(\frac{}{c^{2}}}}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral(1/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(a**2*e/(c**2 + 2*
c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(
c**2 + 2*c*d*x + d**2*x**2)) + 2*B*a*b*x*log(a**2*e/(c**2 + 2*c*d*x + d**2*
x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*
x + d**2*x**2)) + B*b**2*x**2*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a
*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x*
*2))), x)/g**2
```

3.141 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=152

$$\frac{bee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{B}\right)}{2Bg^3(bc-ad)^2}-\frac{de^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\text{Ei}\left(\frac{-A-B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{2Bg^3(a+bx)(bc-ad)^2}$$

```
[Out] 1/2*b*e*exp(A/B)*Ei((-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/B)/B/(-a*d+b*c)^2/g^3-
1/2*d*exp(1/2*A/B)*(d*x+c)*Ei(1/2*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/B)*(e*(b
*x+a)^2/(d*x+c)^2)^(1/2)/B/(-a*d+b*c)^2/g^3/(b*x+a)
```

Rubi [F] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ab^3g^3x^3+3\,Aab^2g^3x^2+3\,Aa^2bg^3x+Aa^3g^3+\left(Bb^3g^3x^3+3\,Bab^2g^3x^2+3\,Ba^2bg^3x+Ba^3g^3\right)\log\left(\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3
 + (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((b
^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

maple [F] time = 0.96, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{3}+3Aa^{2}bx+3Aab^{2}x^{2}+Ab^{3}x^{3}+Ba^{3}\log\left(\frac{a^{2}e}{c^{2}+2cdx+d^{2}x^{2}}+\frac{2abex}{c^{2}+2cdx+d^{2}x^{2}}+\frac{b^{2}ex^{2}}{c^{2}+2cdx+d^{2}x^{2}}\right)+3Ba^{2}bx\log\left(\frac{a^{2}e}{c^{2}+2cdx+d^{2}x^{2}}+\frac{2abex}{c^{2}+2cdx+d^{2}x^{2}}+\frac{b^{2}ex^{2}}{c^{2}+2cdx+d^{2}x^{2}}\right)+3}}{g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral(1/(A*a**3 + 3*A*a**2*b*x + 3*A*a*b**2*x**2 + A*b**3*x**3 + B*a**3*
log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*
x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)) + 3*B*a**2*b*x*log(a**2*e
/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b*
*2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)) + 3*B*a*b**2*x**2*log(a**2*e/(c**2
+ 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x*
*2/(c**2 + 2*c*d*x + d**2*x**2)) + B*b**3*x**3*log(a**2*e/(c**2 + 2*c*d*x +
 d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 +
2*c*d*x + d**2*x**2))), x)/g**3
```

3.142 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\mathrm{Int}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x] + b^2*g^2
*Defer[Int][x^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+(\end{aligned}$$

Mathematica [A] time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

fricas [A] time = 0.73, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((b^2*e*x^2 + 2*a*b*
e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*
x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^{2}}{\left(B \log\left(\frac{(bx+a)^{2} e}{(dx+c)^{2}}\right) + A\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^{2}}{\left(B \ln\left(\frac{(bx+a)^{2} e}{(dx+c)^{2}}\right) + A\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^{3} d g^{2} x^{4} + a^{3} c g^{2} + \left(b^{3} c g^{2} + 3 \, a b^{2} d g^{2}\right) x^{3} + 3 \, \left(a b^{2} c g^{2} + a^{2} b d g^{2}\right) x^{2} + \left(3 \, a^{2} b c g^{2} + a^{3} d g^{2}\right) x}{2 \, \left(2 \, (bc - ad) B^{2} \log\left(bx + a\right) - 2 \, (bc - ad) B^{2} \log\left(dx + c\right) + (bc - ad) A B + \left(bc \log(e) - ad \log(e)\right) B^{2}\right)} + \int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] -1/2*(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^
2*c*g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/(2*(b*c - a*d)*
B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*
log(e) - a*d*log(e))*B^2) + integrate(1/2*(4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2
+ a^3*d*g^2 + 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*
g^2)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) +
(b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(a\,g + b\,g\,x\right)^{2}}{\left(A + B\,\ln\left(\frac{e\,(a+b\,x)^{2}}{(c+d\,x)^{2}}\right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^3cg^2+a^3dg^2x+3a^2bcg^2x+3a^2bdg^2x^2+3ab^2cg^2x^2+3ab^2dg^2x^3+b^3cg^2x^3+b^3dg^2x^4}{2ABad-2ABbc+\left(2B^2ad-2B^2bc\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}-\frac{g^2\left(\int\frac{}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}\right.}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (a**3*c*g**2 + a**3*d*g**2*x + 3*a**2*b*c*g**2*x + 3*a**2*b*d*g**2*x**2 + 3
*a*b**2*c*g**2*x**2 + 3*a*b**2*d*g**2*x**3 + b**3*c*g**2*x**3 + b**3*d*g**2
*x**4)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B**2*b*c)*log(e*(a + b*x)**
2/(c + d*x)**2)) - g**2*(Integral(a**3*d/(A + B*log(a**2*e/(c**2 + 2*c*d*x
+ d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 +
 2*c*d*x + d**2*x**2))), x) + Integral(3*a**2*b*c/(A + B*log(a**2*e/(c**2 +
 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**
2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(3*b**3*c*x**2/(A + B*log(a*
*2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2)
+ b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(4*b**3*d*x**3/(
A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x +
 d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(6*a
*b**2*c*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2
+ 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + I
ntegral(9*a*b**2*d*x**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*
a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x
**2))), x) + Integral(6*a**2*b*d*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2
*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d
*x + d**2*x**2))), x))/(2*B*(a*d - b*c))
```

3.143 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)dx\\
&= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx
\end{aligned}$$

Mathematica [A] time = 0.34, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

fricas [A] time = 0.83, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 +
2*c*d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*
c*d*x + c^2)) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{\left(B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{\left(B \ln\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^2dgx^3 + a^2cg + \left(b^2cg + 2\,abdg\right)x^2 + \left(2\,abcg + a^2dg\right)x}{2\left(2\,(bc-ad)B^2\log(bx+a) - 2\,(bc-ad)B^2\log(dx+c) + (bc-ad)AB + \left(bc\log(e) - ad\log(e)\right)B^2\right)} + \int \frac{}{2\left(2\,(b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*
d*g)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) +
(b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(3*b^2*d*g
*x^2 + 2*a*b*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/(2*(b*c - a*d)*B^2*
log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(
e) - a*d*log(e))*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g + b\,g\,x}{\left(A + B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^2cg + a^2dgx + 2abcgx + 2abdgx^2 + b^2cgx^2 + b^2dgx^3}{2ABad - 2ABbc + \left(2B^2ad - 2B^2bc\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)} - \frac{g\left(\int \frac{a^2d}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2} + \frac{2abex}{c^2+2cdx+d^2x^2} + \frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx + \int \frac{}{A+B}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (a**2*c*g + a**2*d*g*x + 2*a*b*c*g*x + 2*a*b*d*g*x**2 + b**2*c*g*x**2 + b**
2*d*g*x**3)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B**2*b*c)*log(e*(a + b
*x)**2/(c + d*x)**2)) - g*(Integral(a**2*d/(A + B*log(a**2*e/(c**2 + 2*c*d*
x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2
 + 2*c*d*x + d**2*x**2))), x) + Integral(2*a*b*c/(A + B*log(a**2*e/(c**2 +
2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2
/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(2*b**2*c*x/(A + B*log(a**2*e
/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b*
*2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(3*b**2*d*x**2/(A +
B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**
2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(4*a*b*d
*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d
*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x))/(2*B*(a*d
 - b*c))
```

3.144 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.14, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

fricas [A] time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b^2*e*x^2 + 2*
a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log
((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

maple [A]   time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [A]   time = 0.00, size = 0, normalized size = 0.00

$$d\int \frac{1}{2\left(2\left(bcg-adg\right)B^2\log\left(bx+a\right)-2\left(bcg-adg\right)B^2\log\left(dx+c\right)+\left(bcg-adg\right)AB+\left(bcg\log(e)-adg\log(e\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] d*integrate(1/2/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B^2
*log(d*x + c) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2), x
) - 1/2*(d*x + c)/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B
^2*log(d*x + c) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{c+dx}{2ABadg-2ABbcg+\left(2B^2adg-2B^2bcg\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}-\frac{d\int \frac{1}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx}{2Bg\left(ad-bc\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (c + d*x)/(2*A*B*a*d*g - 2*A*B*b*c*g + (2*B**2*a*d*g - 2*B**2*b*c*g)*log(e*
(a + b*x)**2/(c + d*x)**2)) - d*Integral(1/(A + B*log(a**2*e/(c**2 + 2*c*d*
x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2
 + 2*c*d*x + d**2*x**2))), x)/(2*B*g*(a*d - b*c))
```

3.145 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=150

$$-\frac{e^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\text{Ei}\left(\frac{-A-B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{4B^2g^2(a+bx)(bc-ad)}-\frac{c+dx}{2Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}$$

```
[Out] 1/2*(-d*x-c)/B/(-a*d+b*c)/g^2/(b*x+a)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))-1/4*e
xp(1/2*A/B)*(d*x+c)*Ei(1/2*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/B)*(e*(b*x+a)^2
/(d*x+c)^2)^(1/2)/B^2/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x
]
```

fricas [F] time = 1.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2b^2g^2x^2+2\,A^2abg^2x+A^2a^2g^2+\left(B^2b^2g^2x^2+2\,B^2abg^2x+B^2a^2g^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(AB\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*
x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d
^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2
*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{2} \left(B \log\left(\frac{(bx+a)^{2} e}{(dx+c)^{2}}\right) + A\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

maple [F] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{2} \left(B \ln\left(\frac{(bx+a)^{2} e}{(dx+c)^{2}}\right) + A\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{2\left(\left(abcg^{2} - a^{2}dg^{2}\right)AB + \left(abcg^{2}\log(e) - a^{2}dg^{2}\log(e)\right)B^{2} + \left(\left(b^{2}cg^{2} - abdg^{2}\right)AB + \left(b^{2}cg^{2}\log(e) - abdg^{2}\log(e)\right)\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
maxima")
```

```
[Out] -1/2*(d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2
*log(e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2
*log(e))*B^2)*x + 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2
)*B^2)*log(b*x + a) - 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d
*g^2)*B^2)*log(d*x + c)) + integrate(-1/2/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2
 + (B^2*b^2*g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b
*g^2)*x + 2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a)
- 2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{c+dx}{2ABa^2dg^2 - 2ABabcg^2 + 2ABabdg^2x - 2ABb^2cg^2x + \left(2B^2a^2dg^2 - 2B^2abcg^2 + 2B^2abdg^2x - 2B^2b^2cg^2x\right)\log}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (c + d*x)/(2*A*B*a**2*d*g**2 - 2*A*B*a*b*c*g**2 + 2*A*B*a*b*d*g**2*x - 2*A*
B*b**2*c*g**2*x + (2*B**2*a**2*d*g**2 - 2*B**2*a*b*c*g**2 + 2*B**2*a*b*d*g*
*2*x - 2*B**2*b**2*c*g**2*x)*log(e*(a + b*x)**2/(c + d*x)**2)) - Integral(1
/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(a**2*e/(c**2 + 2*c*d*x + d*
*2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c
*d*x + d**2*x**2)) + 2*B*a*b*x*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*
a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x
**2)) + B*b**2*x**2*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c*
*2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x)/
(2*B*g**2)
```

3.146 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=266

$$\frac{de^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\mathrm{Ei}\left(\frac{-A-B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{4B^2g^3(a+bx)(bc-ad)^2}-\frac{bee^{A/B}\mathrm{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{B}\right)}{2B^2g^3(bc-ad)^2}-\frac{b(c+dx)^2}{2Bg^3(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}$$

```
[Out] -1/2*b*e*exp(A/B)*Ei((-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/B)/B^2/(-a*d+b*c)^2/g
^3+1/2*d*(d*x+c)/B/(-a*d+b*c)^2/g^3/(b*x+a)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))
-1/2*b*(d*x+c)^2/B/(-a*d+b*c)^2/g^3/(b*x+a)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2
))+1/4*d*exp(1/2*A/B)*(d*x+c)*Ei(1/2*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/B)*(e
*(b*x+a)^2/(d*x+c)^2)^(1/2)/B^2/(-a*d+b*c)^2/g^3/(b*x+a)
```

Rubi [F] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x
]
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{A^2b^3g^3x^3+3\,A^2ab^2g^3x^2+3\,A^2a^2bg^3x+A^2a^3g^3+\left(B^2b^3g^3x^3+3\,B^2ab^2g^3x^2+3\,B^2a^2bg^3x+B^2a^3g^3\right)\mathrm{l}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2
*a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2
*a^3*g^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2
+ 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^
3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{\left(bx+a\right)^{2}e}{\left(dx+c\right)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

maple [F] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\ln\left(\frac{\left(bx+a\right)^{2}e}{\left(dx+c\right)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{2\Big(\big(a^{2}bcg^{3}-a^{3}dg^{3}\big)AB+\big(a^{2}bcg^{3}\log(e)-a^{3}dg^{3}\log(e)\big)B^{2}+\Big(\big(b^{3}cg^{3}-ab^{2}dg^{3}\big)AB+\big(b^{3}cg^{3}\log(e)-ab^{2}dg^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
maxima")
```

```
[Out] -1/2*(d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d
*g^3*log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b
^2*d*g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g
^3*log(e) - a^2*b*d*g^3*log(e))*B^2)*x + 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x
^2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*l
og(b*x + a) - 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b
*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate(1/
2*(b*d*x + 2*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e)
 - a*b^3*d*g^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*
g^3*log(e) - a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B +
 (a*b^3*c*g^3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 -
 a^3*b*d*g^3)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x + 2*
((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^
2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*
log(b*x + a) - 2*((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*
b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 -
 a^4*d*g^3)*B^2)*log(d*x + c)), x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)^3\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.147 $\int (a+bx)^4 \left(A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$

Optimal. Leaf size=171

$$\frac{(a+bx)^5\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{5b}-\frac{Bn(bc-ad)^5\log(c+dx)}{5bd^5}+\frac{Bnx(bc-ad)^4}{5d^4}-\frac{Bn(a+bx)^2(bc-ad)}{10bd^3}$$

```
[Out] 1/5*B*(-a*d+b*c)^4*n*x/d^4-1/10*B*(-a*d+b*c)^3*n*(b*x+a)^2/b/d^3+1/15*B*(-a
*d+b*c)^2*n*(b*x+a)^3/b/d^2-1/20*B*(-a*d+b*c)*n*(b*x+a)^4/b/d-1/5*B*(-a*d+b
*c)^5*n*ln(d*x+c)/b/d^5+1/5*(b*x+a)^5*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b
```

Rubi [A] time = 0.18, antiderivative size = 183, normalized size of antiderivative = 1.07, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^5}{5b}+\frac{Bnx(bc-ad)^4}{5d^4}-\frac{Bn(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bn(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{Bn(bc-ad)^5\log(c+dx)}{5bd^5}+\frac{B(a+}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (B*(b*c - a*d)^4*n*x)/(5*d^4) - (B*(b*c - a*d)^3*n*(a + b*x)^2)/(10*b*d^3)
+ (B*(b*c - a*d)^2*n*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*n*(a + b*x)^4
)/(20*b*d) + (A*(a + b*x)^5)/(5*b) - (B*(b*c - a*d)^5*n*Log[c + d*x])/(5*b*
d^5) + (B*(a + b*x)^5*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(5*b)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^4 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx = \int \left(A(a+bx)^4+B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$$

$$= \frac{A(a+bx)^5}{5b} + B\int (a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right) dx$$

$$= \frac{A(a+bx)^5}{5b} + \frac{B(a+bx)^5\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{5b} - (B(bc$$

$$= \frac{A(a+bx)^5}{5b} + \frac{B(a+bx)^5\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{5b} - (B(bc$$

$$= \frac{B(bc-ad)^4nx}{5d^4} - \frac{B(bc-ad)^3n(a+bx)^2}{10bd^3} + \frac{B(bc-ad)^2n(a+}{15bd^2}$$

Mathematica [**B**] time = 0.81, size = 364, normalized size = 2.13

$$-48a^5Bd^5n\log(a+bx)+bdx\left(12a^4d^4(5A+4Bn)+12a^3bd^3(10Adx-10Bcn+3Bdnx)+4a^2b^2d^2\left(30Ad^2x^2+B\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(12*a^4*d^4*(5*A + 4*B*n) + 12*a^3*b*d^3*(-10*B*c*n + 10*A*d*x + 3*B
*d*n*x) + 4*a^2*b^2*d^2*(30*A*d^2*x^2 + B*n*(30*c^2 - 15*c*d*x + 4*d^2*x^2)
) + b^4*(12*A*d^4*x^4 + B*c*n*(12*c^3 - 6*c^2*d*x + 4*c*d^2*x^2 - 3*d^3*x^3
)) + a*b^3*d*(60*A*d^3*x^3 + B*n*(-60*c^3 + 30*c^2*d*x - 20*c*d^2*x^2 + 3*d
^3*x^3))) - 48*a^5*B*d^5*n*Log[a + b*x] - 12*B*(b^5*c^5 - 5*a*b^4*c^4*d + 1
0*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - 5*a^5*d^5)*n*Log[c
 + d*x] + 12*B*d^5*(5*a^5 + 5*a^4*b*x + 10*a^3*b^2*x^2 + 10*a^2*b^3*x^3 + 5
*a*b^4*x^4 + b^5*x^5)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(60*b*d^5)
```

fricas [**B**] time = 0.77, size = 563, normalized size = 3.29

$$12\,Ab^5d^5x^5+3\left(20\,Aab^4d^5-\left(Bb^5cd^4-Bab^4d^5\right)n\right)x^4+4\left(30\,Aa^2b^3d^5+\left(Bb^5c^2d^3-5\,Bab^4cd^4+4\,Ba^2b^3d^5\right)n\right)x^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/60*(12*A*b^5*d^5*x^5 + 3*(20*A*a*b^4*d^5 - (B*b^5*c*d^4 - B*a*b^4*d^5)*n)
*x^4 + 4*(30*A*a^2*b^3*d^5 + (B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 + 4*B*a^2*b^3
*d^5)*n)*x^3 + 6*(20*A*a^3*b^2*d^5 - (B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 1
0*B*a^2*b^3*c*d^4 - 6*B*a^3*b^2*d^5)*n)*x^2 + 12*(5*A*a^4*b*d^5 + (B*b^5*c^
4*d - 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 10*B*a^3*b^2*c*d^4 + 4*B*a
^4*b*d^5)*n)*x + 12*(B*b^5*d^5*n*x^5 + 5*B*a*b^4*d^5*n*x^4 + 10*B*a^2*b^3*d
^5*n*x^3 + 10*B*a^3*b^2*d^5*n*x^2 + 5*B*a^4*b*d^5*n*x + B*a^5*d^5*n)*log(b*
x + a) - 12*(B*b^5*d^5*n*x^5 + 5*B*a*b^4*d^5*n*x^4 + 10*B*a^2*b^3*d^5*n*x^3
 + 10*B*a^3*b^2*d^5*n*x^2 + 5*B*a^4*b*d^5*n*x + (B*b^5*c^5 - 5*B*a*b^4*c^4*
d + 10*B*a^2*b^3*c^3*d^2 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*n)*log(d
*x + c) + 12*(B*b^5*d^5*x^5 + 5*B*a*b^4*d^5*x^4 + 10*B*a^2*b^3*d^5*x^3 + 10
*B*a^3*b^2*d^5*x^2 + 5*B*a^4*b*d^5*x)*log(e))/(b*d^5)
```

giac [**B**] time = 11.53, size = 497, normalized size = 2.91

$$\frac{Ba^5n\log(bx+a)}{5\,b}+\frac{1}{5}\left(Ab^4+Bb^4\right)x^5-\frac{\left(Bb^4cn-Bab^3dn-20\,Aab^3d-20\,Bab^3d\right)x^4}{20\,d}+\frac{\left(Bb^4c^2n-5\,Bab^3cdn+4\,Ba\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/5*B*a^5*n*log(b*x + a)/b + 1/5*(A*b^4 + B*b^4)*x^5 - 1/20*(B*b^4*c*n - B*
a*b^3*d*n - 20*A*a*b^3*d - 20*B*a*b^3*d)*x^4/d + 1/15*(B*b^4*c^2*n - 5*B*a*
b^3*c*d*n + 4*B*a^2*b^2*d^2*n + 30*A*a^2*b^2*d^2 + 30*B*a^2*b^2*d^2)*x^3/d^
2 + 1/5*(B*b^4*n*x^5 + 5*B*a*b^3*n*x^4 + 10*B*a^2*b^2*n*x^3 + 10*B*a^3*b*n*
x^2 + 5*B*a^4*n*x)*log(b*x + a) - 1/5*(B*b^4*n*x^5 + 5*B*a*b^3*n*x^4 + 10*B
*a^2*b^2*n*x^3 + 10*B*a^3*b*n*x^2 + 5*B*a^4*n*x)*log(d*x + c) - 1/10*(B*b^4
*c^3*n - 5*B*a*b^3*c^2*d*n + 10*B*a^2*b^2*c*d^2*n - 6*B*a^3*b*d^3*n - 20*A*
a^3*b*d^3 - 20*B*a^3*b*d^3)*x^2/d^3 + 1/5*(B*b^4*c^4*n - 5*B*a*b^3*c^3*d*n
+ 10*B*a^2*b^2*c^2*d^2*n - 10*B*a^3*b*c*d^3*n + 4*B*a^4*d^4*n + 5*A*a^4*d^4
 + 5*B*a^4*d^4)*x/d^4 - 1/5*(B*b^4*c^5*n - 5*B*a*b^3*c^4*d*n + 10*B*a^2*b^2
*c^3*d^2*n - 10*B*a^3*b*c^2*d^3*n + 5*B*a^4*c*d^4*n)*log(-d*x - c)/d^5
```

maple [C] time = 0.78, size = 2374, normalized size = 13.88

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/5*(b*x+a)^5*B/b*ln((d*x+c)^n)+ln((b*x+a)^n)*x*B*a^4+1/5*b^4*A*x^5+1/5*b^
4*B*ln(e)*x^5+1/5*b^4*B*x^5*ln((b*x+a)^n)+B*ln(e)*a^4*x+b^3*A*a*x^4+2*b^2*A
*a^2*x^3+2*b*A*a^3*x^2+A*a^4*x+b^3*B*ln(e)*a*x^4+b^3*B*a*x^4*ln((b*x+a)^n)+
2*b^2*B*ln(e)*a^2*x^3+2*b^2*B*a^2*x^3*ln((b*x+a)^n)+2*b*B*ln(e)*a^3*x^2+2*b
*B*a^3*x^2*ln((b*x+a)^n)+1/5/b*B*ln(d*x+c)*a^5*n-1/2*I*B*Pi*a^4*x*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^3-1/10*I*b^4*B*Pi*x^5*csgn(I*(b*x+a)^n/((d*x+c)^n))^
3-1/10*I*b^4*B*Pi*x^5*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/20*b^3*B*a*n*x^4-
1/20*b^4/d*B*c*n*x^4+4/15*b^2*B*a^2*n*x^3+1/15*b^4/d^2*B*c^2*n*x^3+3/5*b*B*
a^3*n*x^2-1/10*b^4/d^3*B*c^3*n*x^2+4/5*B*a^4*n*x+1/5*b^4/d^4*B*c^4*n*x-1/5*
b^4/d^5*B*ln(d*x+c)*c^5*n-1/d*B*ln(d*x+c)*a^4*c*n-1/2*I*B*Pi*a^4*x*csgn(I*(
b*x+a)^n/((d*x+c)^n))^3+I*b^2*B*Pi*a^2*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)
^n/((d*x+c)^n))^2+I*b^2*B*Pi*a^2*x^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^2+I*b^2*B*Pi*a^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2+I*b^2*B*Pi*a^2*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^2+I*b*B*Pi*a^3*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+I*b*B*Pi*a^3*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*b*
B*Pi*a^3*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^
2+I*b*B*Pi*a^3*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/10*I*b^4*B
*Pi*x^5*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)-1/10*I*b^4*B*Pi*x^5*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))+1/2*I*b^3*B*Pi*a*x^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^2+1/2*I*b^3*B*Pi*a*x^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d
*x+c)^n))^2+1/2*I*b^3*B*Pi*a*x^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2+1/2*I*b^3*B*Pi*a*x^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2-1/2*I*B*Pi*a^4*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*a^4*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c
)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/3*b^3/d*B*a*c*n*x^3-b^2/d*B*a^2*c*n*x
^2+1/2*b^3/d^2*B*a*c^2*n*x^2-2*b/d*B*a^3*c*n*x+2*b^2/d^2*B*a^2*c^2*n*x-b^3/
d^3*B*a*c^3*n*x+2*b/d^2*B*ln(d*x+c)*a^3*c^2*n-2*b^2/d^3*B*ln(d*x+c)*a^2*c^3
*n+b^3/d^4*B*ln(d*x+c)*a*c^4*n-I*b*B*Pi*a^3*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^3+1/2*I*B*Pi*a^4*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1
/2*I*B*Pi*a^4*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B
*Pi*a^4*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1
/2*I*B*Pi*a^4*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/10*I*b^4*B*Pi
*x^5*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/10*I*b^4*B*Pi*x^5*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/10*I*b^4*B*Pi*x^5*csg
n(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/10*I*b^4*B*P
```

```
i*x^5*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*b^3*B*Pi*a*x^4*csgn
(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*b^3*B*Pi*a*x^4*csgn(I*e/((d*x+c)^n)*(b*x+
a)^n)^3-I*b^2*B*Pi*a^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*b^2*B*Pi*a^2*x
^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*b*B*Pi*a^3*x^2*csgn(I*(b*x+a)^n/((d*
x+c)^n))^3+1/5*B*a^5*n/b*ln(-b*x-a)-I*b^2*B*Pi*a^2*x^3*csgn(I*e)*csgn(I*(b*
x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*b^2*B*Pi*a^2*x^3*csgn
(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*b*B*Pi*a^
3*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^
n)-I*b*B*Pi*a^3*x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))-1/2*I*b^3*B*Pi*a*x^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*b^3*B*Pi*a*x^4*csgn(I*(b*x+a)^n)*csgn(
I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
```

maxima [B] time = 1.47, size = 671, normalized size = 3.92

$$\frac{1}{5}\,Bb^4x^5\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{5}\,Ab^4x^5+Bab^3x^4\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aab^3x^4+2\,Ba^2b^2x^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+2\,Aa^2b^2x^3+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/5*B*b^4*x^5*log((b*x + a)^n*e/(d*x + c)^n) + 1/5*A*b^4*x^5 + B*a*b^3*x^4*
log((b*x + a)^n*e/(d*x + c)^n) + A*a*b^3*x^4 + 2*B*a^2*b^2*x^3*log((b*x + a
)^n*e/(d*x + c)^n) + 2*A*a^2*b^2*x^3 + 2*B*a^3*b*x^2*log((b*x + a)^n*e/(d*x
 + c)^n) + 2*A*a^3*b*x^2 + B*a^4*x*log((b*x + a)^n*e/(d*x + c)^n) + A*a^4*x
 + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*a^4/e - 2*(a^2*e*n*log(b
*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*B*a^3
*b/e + (2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d
*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*B*a^2
*b^2/e - 1/6*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*
(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2
 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*a*b^3/e + 1/60*(12*a^5*e*n
*log(b*x + a)/b^5 - 12*c^5*e*n*log(d*x + c)/d^5 - (3*(b^4*c*d^3*e*n - a*b^3
*d^4*e*n)*x^4 - 4*(b^4*c^2*d^2*e*n - a^2*b^2*d^4*e*n)*x^3 + 6*(b^4*c^3*d*e*
n - a^3*b*d^4*e*n)*x^2 - 12*(b^4*c^4*e*n - a^4*d^4*e*n)*x)/(b^4*d^4))*B*b^4
/e
```

mupad [B] time = 4.56, size = 936, normalized size = 5.47

$$x^4\left(\frac{b^3\,(25\,A\,a\,d+5\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{20\,d}-\frac{A\,b^3\,(5\,a\,d+5\,b\,c)}{20\,d}\right)-x^3\left(\frac{(5\,a\,d+5\,b\,c)\,\left(\frac{b^3\,(25\,A\,a\,d+5\,A\,b\,c+B\,a\,d\,n-B\,b}{5\,d}\right.}{15\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a + b*x)^4,x)
```

```
[Out] x^4*((b^3*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(20*d) - (A*b^3*(5*a*d
+ 5*b*c))/(20*d)) - x^3*(((5*a*d + 5*b*c)*((b^3*(25*A*a*d + 5*A*b*c + B*a*d
*n - B*b*c*n))/(5*d) - (A*b^3*(5*a*d + 5*b*c))/(5*d)))/(15*b*d) - (a*b^2*(1
```

```
0*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(3*d) + (A*a*b^3*c)/(3*d)) + log((e
*(a + b*x)^n)/(c + d*x)^n)*((B*b^4*x^5)/5 + B*a^4*x + 2*B*a^3*b*x^2 + B*a*b
^3*x^4 + 2*B*a^2*b^2*x^3) + x*((a^3*(5*A*a*d + 10*A*b*c + 2*B*a*d*n - 2*B*b
*c*n))/d - ((5*a*d + 5*b*c)*((2*a^2*b*(5*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*
n))/d + ((5*a*d + 5*b*c)*(((5*a*d + 5*b*c)*((b^3*(25*A*a*d + 5*A*b*c + B*a*
d*n - B*b*c*n))/(5*d) - (A*b^3*(5*a*d + 5*b*c))/(5*d)))/(5*b*d) - (a*b^2*(1
0*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/d + (A*a*b^3*c)/d))/(5*b*d) - (a*c*
((b^3*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(5*d) - (A*b^3*(5*a*d + 5*b
*c))/(5*d)))/(b*d)))/(5*b*d) + (a*c*(((5*a*d + 5*b*c)*((b^3*(25*A*a*d + 5*A
*b*c + B*a*d*n - B*b*c*n))/(5*d) - (A*b^3*(5*a*d + 5*b*c))/(5*d)))/(5*b*d)
- (a*b^2*(10*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/d + (A*a*b^3*c)/d))/(b*d
)) + x^2*((a^2*b*(5*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/d + ((5*a*d + 5*b
*c)*(((5*a*d + 5*b*c)*((b^3*(25*A*a*d + 5*A*b*c + B*a*d*n - B*b*c*n))/(5*d)
 - (A*b^3*(5*a*d + 5*b*c))/(5*d)))/(5*b*d) - (a*b^2*(10*A*a*d + 5*A*b*c + B
*a*d*n - B*b*c*n))/d + (A*a*b^3*c)/d))/(10*b*d) - (a*c*((b^3*(25*A*a*d + 5*
A*b*c + B*a*d*n - B*b*c*n))/(5*d) - (A*b^3*(5*a*d + 5*b*c))/(5*d)))/(2*b*d)
) + (A*b^4*x^5)/5 - (log(c + d*x)*(B*b^4*c^5*n + 5*B*a^4*c*d^4*n + 10*B*a^2
*b^2*c^3*d^2*n - 5*B*a*b^3*c^4*d*n - 10*B*a^3*b*c^2*d^3*n))/(5*d^5) + (B*a^
5*n*log(a + b*x))/(5*b)
```

sympy [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**4*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)

[Out] Exception raised: HeuristicGCDFailed
```

3.148 $\int (a+bx)^3 \left(A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$

Optimal. Leaf size=142

$$\frac{(a+bx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{4b}+\frac{Bn(bc-ad)^4\log(c+dx)}{4bd^4}-\frac{Bnx(bc-ad)^3}{4d^3}+\frac{Bn(a+bx)^2(bc-ad)^2}{8bd^2}-$$

```
[Out] -1/4*B*(-a*d+b*c)^3*n*x/d^3+1/8*B*(-a*d+b*c)^2*n*(b*x+a)^2/b/d^2-1/12*B*(-a
*d+b*c)*n*(b*x+a)^3/b/d+1/4*B*(-a*d+b*c)^4*n*ln(d*x+c)/b/d^4+1/4*(b*x+a)^4*
(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b
```

Rubi [A] time = 0.14, antiderivative size = 154, normalized size of antiderivative = 1.08, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^4}{4b}-\frac{Bnx(bc-ad)^3}{4d^3}+\frac{Bn(a+bx)^2(bc-ad)^2}{8bd^2}+\frac{Bn(bc-ad)^4\log(c+dx)}{4bd^4}+\frac{B(a+bx)^4\log\left(e(a+bx)^n(c+dx\right.}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)^3*n*x)/(4*d^3) + (B*(b*c - a*d)^2*n*(a + b*x)^2)/(8*b*d^2)
- (B*(b*c - a*d)*n*(a + b*x)^3)/(12*b*d) + (A*(a + b*x)^4)/(4*b) + (B*(b*c
- a*d)^4*n*Log[c + d*x])/(4*b*d^4) + (B*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c
+ d*x)^n])/(4*b)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^3 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx = \int \left(A(a+bx)^3+B(a+bx)^3\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,d$$

$$= \frac{A(a+bx)^4}{4b}+B\int (a+bx)^3\log \left(e(a+bx)^n(c+dx)^{-n}\right)\,dx$$

$$= \frac{A(a+bx)^4}{4b}+\frac{B(a+bx)^4\log \left(e(a+bx)^n(c+dx)^{-n}\right)}{4b}-(B$$

$$= \frac{A(a+bx)^4}{4b}+\frac{B(a+bx)^4\log \left(e(a+bx)^n(c+dx)^{-n}\right)}{4b}-(B$$

$$= -\frac{B(bc-ad)^3nx}{4d^3}+\frac{B(bc-ad)^2n(a+bx)^2}{8bd^2}-\frac{B(bc-ad)n(}{12bd}$$

Mathematica [A] time = 0.49, size = 273, normalized size = 1.92

$$-18a^4Bd^4n\log(a+bx)+bdx\left(6a^3d^3(4A+3Bn)+9a^2bd^2(4Adx-4Bcn+Bdnx)+2ab^2d\left(12Ad^2x^2+Bn\left(12\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(6*a^3*d^3*(4*A + 3*B*n) + 9*a^2*b*d^2*(-4*B*c*n + 4*A*d*x + B*d*n*x
) + b^3*(6*A*d^3*x^3 + B*c*n*(-6*c^2 + 3*c*d*x - 2*d^2*x^2)) + 2*a*b^2*d*(1
2*A*d^2*x^2 + B*n*(12*c^2 - 6*c*d*x + d^2*x^2))) - 18*a^4*B*d^4*n*Log[a + b
*x] + 6*B*(b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + 4*
a^4*d^4)*n*Log[c + d*x] + 6*B*d^4*(4*a^4 + 4*a^3*b*x + 6*a^2*b^2*x^2 + 4*a*
b^3*x^3 + b^4*x^4)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(24*b*d^4)
```

fricas [B] time = 0.57, size = 417, normalized size = 2.94

$$6\,Ab^4d^4x^4+2\left(12\,Aab^3d^4-\left(Bb^4cd^3-Bab^3d^4\right)n\right)x^3+3\left(12\,Aa^2b^2d^4+\left(Bb^4c^2d^2-4\,Bab^3cd^3+3\,Ba^2b^2d^4\right)n\right)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/24*(6*A*b^4*d^4*x^4 + 2*(12*A*a*b^3*d^4 - (B*b^4*c*d^3 - B*a*b^3*d^4)*n)*
x^3 + 3*(12*A*a^2*b^2*d^4 + (B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + 3*B*a^2*b^2*
d^4)*n)*x^2 + 6*(4*A*a^3*b*d^4 - (B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2
*b^2*c*d^3 - 3*B*a^3*b*d^4)*n)*x + 6*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3
 + 6*B*a^2*b^2*d^4*n*x^2 + 4*B*a^3*b*d^4*n*x + B*a^4*d^4*n)*log(b*x + a) -
6*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2*b^2*d^4*n*x^2 + 4*B*a^3*
b*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*
c*d^3)*n)*log(d*x + c) + 6*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2
*d^4*x^2 + 4*B*a^3*b*d^4*x)*log(e))/(b*d^4)
```

giac [B] time = 3.82, size = 355, normalized size = 2.50

$$\frac{Ba^4n\log\left(bx+a\right)}{4\,b}+\frac{1}{4}\left(Ab^3+Bb^3\right)x^4-\frac{\left(Bb^3cn-Bab^2dn-12\,Aab^2d-12\,Bab^2d\right)x^3}{12\,d}+\frac{1}{4}\left(Bb^3nx^4+4\,Bab^2nx^3+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/4*B*a^4*n*log(b*x + a)/b + 1/4*(A*b^3 + B*b^3)*x^4 - 1/12*(B*b^3*c*n - B*
a*b^2*d*n - 12*A*a*b^2*d - 12*B*a*b^2*d)*x^3/d + 1/4*(B*b^3*n*x^4 + 4*B*a*b
^2*n*x^3 + 6*B*a^2*b*n*x^2 + 4*B*a^3*n*x)*log(b*x + a) - 1/4*(B*b^3*n*x^4 +
 4*B*a*b^2*n*x^3 + 6*B*a^2*b*n*x^2 + 4*B*a^3*n*x)*log(d*x + c) + 1/8*(B*b^3
*c^2*n - 4*B*a*b^2*c*d*n + 3*B*a^2*b*d^2*n + 12*A*a^2*b*d^2 + 12*B*a^2*b*d^
2)*x^2/d^2 - 1/4*(B*b^3*c^3*n - 4*B*a*b^2*c^2*d*n + 6*B*a^2*b*c*d^2*n - 3*B
*a^3*d^3*n - 4*A*a^3*d^3 - 4*B*a^3*d^3)*x/d^3 + 1/4*(B*b^3*c^4*n - 4*B*a*b^
2*c^3*d*n + 6*B*a^2*b*c^2*d^2*n - 4*B*a^3*c*d^3*n)*log(d*x + c)/d^4
```

maple [C] time = 0.51, size = 1840, normalized size = 12.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] ln((b*x+a)^n)*x*B*a^3+1/4*b^3*A*x^4+1/4*b^3*B*ln(e)*x^4+1/4*b^3*B*x^4*ln((b
*x+a)^n)+B*ln(e)*a^3*x-1/4*(b*x+a)^4*B/b*ln((d*x+c)^n)+1/12*b^2*B*a*n*x^3-1
/12*b^3/d*B*c*n*x^3-1/2*I*b^2*B*Pi*a*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^
n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*b^2*B*Pi*a*x^3*csgn(I*e)*csgn(I*(b*
x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-3/4*I*b*B*Pi*a^2*x^2*cs
gn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-3/4*I*b*B
*Pi*a^2*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)-1/2*b^2/d*B*a*c*n*x^2-3/2*b/d*B*a^2*c*n*x+b^2/d^2*B*a*c^2*n*x+1/4*
B*a^4*n/b*ln(-b*x-a)+b^2*A*a*x^3+3/2*b*A*a^2*x^2+A*a^3*x+3/2*b*B*ln(e)*a^2*
x^2+b^2*B*ln(e)*a*x^3+b^2*B*a*x^3*ln((b*x+a)^n)+3/2*b*B*a^2*x^2*ln((b*x+a)^
n)+1/4/b*B*ln(d*x+c)*a^4*n-1/4*b^3/d^3*B*c^3*n*x-1/d*B*ln(d*x+c)*a^3*c*n+1/
4*b^3/d^4*B*ln(d*x+c)*c^4*n-1/8*I*b^3*B*Pi*x^4*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^3-1/8*I*b^3*B*Pi*x^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*a^3*x*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*a^3*x*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^3+3/4*I*b*B*Pi*a^2*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n
))^2+3/4*I*b*B*Pi*a^2*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3/4*I
*b*B*Pi*a^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^
n)^2-1/2*I*B*Pi*a^3*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^
n/((d*x+c)^n))-1/2*I*B*Pi*a^3*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csg
n(I*e/((d*x+c)^n)*(b*x+a)^n)-1/8*I*b^3*B*Pi*x^4*csgn(I*(b*x+a)^n)*csgn(I/((
d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/8*I*b^3*B*Pi*x^4*csgn(I*e)*csgn(
I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*I*b^2*B*Pi*a*x
^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*b^2*B*Pi*a*x^3*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*b^2*B*Pi*a*x^3*csg
n(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*b^2*B*Pi*a*x^3*csgn(I*(b*x+a
)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3/4*I*b*B*Pi*a^2*x^2*csg
n(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+3/8*b*B*a^2*n*x^2+1/8*b^3/d^
2*B*c^2*n*x^2+3/4*B*a^3*n*x+3/2*b/d^2*B*ln(d*x+c)*a^2*c^2*n-b^2/d^3*B*ln(d*
x+c)*a*c^3*n+1/2*I*B*Pi*a^3*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n
))^2+1/2*I*B*Pi*a^3*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1
/2*I*B*Pi*a^3*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*a^3*
x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/8*I*b^3
*B*Pi*x^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/8*I*b^3*B*Pi*
x^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/8*I*b^3*B*Pi*x^4*
csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/8*I*b^3*B*Pi*x^4*csgn(I*(b*x+
a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*b^2*B*Pi*a*x^3*cs
gn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*b^2*B*Pi*a*x^3*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^3-3/4*I*b*B*Pi*a^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-3/4*I*b*B*Pi
*a^2*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3
```

maxima [B] time = 1.40, size = 467, normalized size = 3.29

$$\frac{1}{4}\,Bb^{3}x^{4}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+\frac{1}{4}\,Ab^{3}x^{4}+Bab^{2}x^{3}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+Aab^{2}x^{3}+\frac{3}{2}\,Ba^{2}bx^{2}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+\frac{3}{2}\,Aa^{2}bx^{2}+B$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/4*B*b^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A*b^3*x^4 + B*a*b^2*x^3*
log((b*x + a)^n*e/(d*x + c)^n) + A*a*b^2*x^3 + 3/2*B*a^2*b*x^2*log((b*x + a
)^n*e/(d*x + c)^n) + 3/2*A*a^2*b*x^2 + B*a^3*x*log((b*x + a)^n*e/(d*x + c)^
n) + A*a^3*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*a^3/e - 3/2*
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*a^2*b/e + 1/2*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x +
c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x
)/(b^2*d^2))*B*a*b^2/e - 1/24*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d
*x + c)/d^4 + (2*(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a
^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*b^3/e
```

mupad [**B**] time = 4.49, size = 520, normalized size = 3.66

$$x^3\left(\frac{b^2\,\left(16\,A\,a\,d+4\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n\right)}{12\,d}-\frac{A\,b^2\,\left(4\,a\,d+4\,b\,c\right)}{12\,d}\right)+\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\,\left(B\,a^3\,x+\frac{3\,B\,a^2\,b\,x^2}{2}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a + b*x)^3,x)
```

```
[Out] x^3*((b^2*(16*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(12*d) - (A*b^2*(4*a*d
+ 4*b*c))/(12*d)) + log((e*(a + b*x)^n)/(c + d*x)^n)*((B*b^3*x^4)/4 + B*a^3
*x + (3*B*a^2*b*x^2)/2 + B*a*b^2*x^3) + x*((a^2*(8*A*a*d + 12*A*b*c + 3*B*a
*d*n - 3*B*b*c*n))/(2*d) + ((4*a*d + 4*b*c)*(((4*a*d + 4*b*c)*((b^2*(16*A*a
*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(4*d) - (A*b^2*(4*a*d + 4*b*c))/(4*d)))/
(4*b*d) - (a*b*(6*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/d + (A*a*b^2*c)/d))
/(4*b*d) - (a*c*((b^2*(16*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(4*d) - (A*
b^2*(4*a*d + 4*b*c))/(4*d)))/(b*d)) - x^2*(((4*a*d + 4*b*c)*((b^2*(16*A*a*d
 + 4*A*b*c + B*a*d*n - B*b*c*n))/(4*d) - (A*b^2*(4*a*d + 4*b*c))/(4*d)))/(8
*b*d) - (a*b*(6*A*a*d + 4*A*b*c + B*a*d*n - B*b*c*n))/(2*d) + (A*a*b^2*c)/(
2*d)) + (A*b^3*x^4)/4 + (log(c + d*x)*(B*b^3*c^4*n - 4*B*a^3*c*d^3*n - 4*B*
a*b^2*c^3*d*n + 6*B*a^2*b*c^2*d^2*n))/(4*d^4) + (B*a^4*n*log(a + b*x))/(4*b
)
```

sympy [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.149 $\int (a+bx)^2 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=113

$$\frac{(a+bx)^3\left(B\log \left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{3b}-\frac{Bn(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bnx(bc-ad)^2}{3d^2}-\frac{Bn(a+bx)^2(bc-ad)}{6bd}$$

```
[Out] 1/3*B*(-a*d+b*c)^2*n*x/d^2-1/6*B*(-a*d+b*c)*n*(b*x+a)^2/b/d-1/3*B*(-a*d+b*c
)^3*n*ln(d*x+c)/b/d^3+1/3*(b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b
```

Rubi [A] time = 0.12, antiderivative size = 125, normalized size of antiderivative = 1.11, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^3}{3b}+\frac{Bnx(bc-ad)^2}{3d^2}-\frac{Bn(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{B(a+bx)^3\log \left(e(a+bx)^n(c+dx)^{-n}\right)}{3b}-\frac{Bn(a+bx)^2(bc-}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (B*(b*c - a*d)^2*n*x)/(3*d^2) - (B*(b*c - a*d)*n*(a + b*x)^2)/(6*b*d) + (A*
(a + b*x)^3)/(3*b) - (B*(b*c - a*d)^3*n*Log[c + d*x])/(3*b*d^3) + (B*(a + b
*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx = \int \left(A(a+bx)^2+B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)$$

$$= \frac{A(a+bx)^3}{3b} + B\int (a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right) dx$$

$$= \frac{A(a+bx)^3}{3b} + \frac{B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b} - (B$$

$$= \frac{A(a+bx)^3}{3b} + \frac{B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b} - (B$$

$$= \frac{B(bc-ad)^2nx}{3d^2} - \frac{B(bc-ad)n(a+bx)^2}{6bd} + \frac{A(a+bx)^3}{3b} - B$$

Mathematica [A] time = 0.29, size = 194, normalized size = 1.72

$$-4a^3Bd^3n\log(a+bx) + bdx\left(2a^2d^2(3A+2Bn) + abd(6Adx-6Bcn+Bdnx) + b^2\left(2Ad^2x^2+Bcn(2c-dx)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(2*a^2*d^2*(3*A + 2*B*n) + a*b*d*(-6*B*c*n + 6*A*d*x + B*d*n*x) + b^
2*(2*A*d^2*x^2 + B*c*n*(2*c - d*x))) - 4*a^3*B*d^3*n*Log[a + b*x] - 2*B*(b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - 3*a^3*d^3)*n*Log[c + d*x] + 2*B*d^3
*(3*a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/(6*b*d^3)
```

fricas [B] time = 0.96, size = 282, normalized size = 2.50

$$2\,Ab^3d^3x^3 + \left(6\,Aab^2d^3 - \left(Bb^3cd^2 - Bab^2d^3\right)n\right)x^2 + 2\left(3\,Aa^2bd^3 + \left(Bb^3c^2d - 3\,Bab^2cd^2 + 2\,Ba^2bd^3\right)n\right)x + 2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/6*(2*A*b^3*d^3*x^3 + (6*A*a*b^2*d^3 - (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2
+ 2*(3*A*a^2*b*d^3 + (B*b^3*c^2*d - 3*B*a*b^2*c*d^2 + 2*B*a^2*b*d^3)*n)*x +
 2*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x + B*a^3*d^3*n
)*log(b*x + a) - 2*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n
*x + (B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log(d*x + c) + 2*(B
*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x^2 + 3*B*a^2*b*d^3*x)*log(e))/(b*d^3)
```

giac [B] time = 1.38, size = 235, normalized size = 2.08

$$\frac{Ba^3n\log(bx+a)}{3\,b} + \frac{1}{3}\left(Ab^2+Bb^2\right)x^3 - \frac{\left(Bb^2cn - Babdn - 6\,Aabd - 6\,Babd\right)x^2}{6\,d} + \frac{1}{3}\left(Bb^2nx^3 + 3\,Babnx^2 + 3\,Ba^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/3*B*a^3*n*log(b*x + a)/b + 1/3*(A*b^2 + B*b^2)*x^3 - 1/6*(B*b^2*c*n - B*a
*b*d*n - 6*A*a*b*d - 6*B*a*b*d)*x^2/d + 1/3*(B*b^2*n*x^3 + 3*B*a*b*n*x^2 +
3*B*a^2*n*x)*log(b*x + a) - 1/3*(B*b^2*n*x^3 + 3*B*a*b*n*x^2 + 3*B*a^2*n*x)
*log(d*x + c) + 1/3*(B*b^2*c^2*n - 3*B*a*b*c*d*n + 2*B*a^2*d^2*n + 3*A*a^2*
```

```
d^2 + 3*B*a^2*d^2)*x/d^2 - 1/3*(B*b^2*c^3*n - 3*B*a*b*c^2*d*n + 3*B*a^2*c*d
^2*n)*log(-d*x - c)/d^3
```

maple [C] time = 0.47, size = 1325, normalized size = 11.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/3*(b*x+a)^3*B/b*ln((d*x+c)^n)+1/3*b^2*A*x^3+B*ln(e)*a^2*x+1/3*b^2*B*x^3*
ln((b*x+a)^n)+1/3*b^2*B*ln(e)*x^3+ln((b*x+a)^n)*x*B*a^2+1/3*B*a^3*n/b*ln(-b
*x-a)-1/2*I*b*B*Pi*a*x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))-1/2*I*b*B*Pi*a*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n)
)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*a^2*x*csgn(I*e)*csgn(I*(b*x+a)
^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*a^2*x*csgn(I*(b*
x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/6*I*b^2*B*Pi*x^
3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1
/6*I*b^2*B*Pi*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((
d*x+c)^n))+1/2*I*b*B*Pi*a*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n
))^2+1/2*I*b*B*Pi*a*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
+1/2*I*b*B*Pi*a*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^2+1/2*I*b*B*Pi*a*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/6
*I*b^2*B*Pi*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*a^2*x*csgn(I*(
b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*a^2*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+
2/3*B*a^2*n*x+1/3*b^2/d^2*B*c^2*n*x-1/3*b^2/d^3*B*ln(d*x+c)*c^3*n-1/d*B*ln(
d*x+c)*a^2*c*n-1/6*I*b^2*B*Pi*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I*B*P
i*a^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a^2*x*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a^2*x*csgn(I
*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*a^2*x*
csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/6*I*b^2*B*Pi*x^3*csgn(I*(b*x+
a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/6*I*b^2*B*Pi*x^3*csgn(I/((d*x+c)^n)
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/6*I*b^2*B*Pi*x^3*csgn(I*(b*x+a)^n/((d*x
+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/6*I*b^2*B*Pi*x^3*csgn(I*e)*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*b*B*Pi*a*x^2*csgn(I*(b*x+a)^n/((d*x+c)^
n))^3-1/2*I*b*B*Pi*a*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+b*A*a*x^2+A*a^2*
x+1/3/b*B*ln(d*x+c)*a^3*n+b*B*a*x^2*ln((b*x+a)^n)+b*B*ln(e)*a*x^2-b/d*B*a*c
*n*x+b/d^2*B*ln(d*x+c)*a*c^2*n+1/6*b*B*a*n*x^2-1/6*b^2/d*B*c*n*x^2
```

maxima [B] time = 1.27, size = 294, normalized size = 2.60

$$\frac{1}{3}Bb^2x^3\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+\frac{1}{3}Ab^2x^3+Babx^2\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+Aabx^2+Ba^2x\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+Aa^2x+\frac{\left(\frac{aen\log(bx+a)}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/3*B*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A*b^2*x^3 + B*a*b*x^2*lo
g((b*x + a)^n*e/(d*x + c)^n) + A*a*b*x^2 + B*a^2*x*log((b*x + a)^n*e/(d*x +
 c)^n) + A*a^2*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*a^2/e -
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*a*b/e + 1/6*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)
/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/
(b^2*d^2))*B*b^2/e
```

mupad [**B**] time = 4.24, size = 262, normalized size = 2.32

$$\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\left(B\,a^2\,x+B\,a\,b\,x^2+\frac{B\,b^2\,x^3}{3}\right)+x^2\,\Bigg(\frac{b\,(9\,A\,a\,d+3\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n)}{6\,d}-\frac{A\,b\,(3\,a\,d+3\,b\,c)}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a + b*x)^2,x)
```

```
[Out] log((e*(a + b*x)^n)/(c + d*x)^n)*((B*b^2*x^3)/3 + B*a^2*x + B*a*b*x^2) + x^
2*((b*(9*A*a*d + 3*A*b*c + B*a*d*n - B*b*c*n))/(6*d) - (A*b*(3*a*d + 3*b*c)
)/(6*d)) - x*((((b*(9*A*a*d + 3*A*b*c + B*a*d*n - B*b*c*n))/(3*d) - (A*b*(3
*a*d + 3*b*c))/(3*d))*(3*a*d + 3*b*c))/(3*b*d) - (a*(3*A*a*d + 3*A*b*c + B*
a*d*n - B*b*c*n))/d + (A*a*b*c)/d) + (A*b^2*x^3)/3 - (log(c + d*x)*(B*b^2*c
^3*n + 3*B*a^2*c*d^2*n - 3*B*a*b*c^2*d*n))/(3*d^3) + (B*a^3*n*log(a + b*x))
/(3*b)
```

sympy [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.150 $\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=84

$$\frac{(a+bx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{2b}+\frac{Bn(bc-ad)^2\log(c+dx)}{2bd^2}-\frac{Bnx(bc-ad)}{2d}$$

```
[Out] -1/2*B*(-a*d+b*c)*n*x/d+1/2*B*(-a*d+b*c)^2*n*ln(d*x+c)/b/d^2+1/2*(b*x+a)^2*
(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b
```

Rubi [A] time = 0.09, antiderivative size = 96, normalized size of antiderivative = 1.14, number of steps used = 5, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^2}{2b}+\frac{Bn(bc-ad)^2\log(c+dx)}{2bd^2}+\frac{B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b}-\frac{Bnx(bc-ad)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*n*x)/(2*d) + (A*(a + b*x)^2)/(2*b) + (B*(b*c - a*d)^2*n*Log
[c + d*x])/(2*b*d^2) + (B*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*
b)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx = \int \left(A(a+bx)+B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$$

$$= \frac{A(a+bx)^2}{2b} + B\int (a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx$$

$$= \frac{A(a+bx)^2}{2b} + \frac{B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} - \frac{(B(}{}$$

$$= \frac{A(a+bx)^2}{2b} + \frac{B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} - \frac{(B(}{}$$

$$= -\frac{B(bc-ad)nx}{2d} + \frac{A(a+bx)^2}{2b} + \frac{B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

Mathematica [**A**] time = 0.15, size = 126, normalized size = 1.50

$$\frac{d\left(Bd\left(2a^2+2abx+b^2x^2\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+bx(2aAd+aBdn+Abdx-bBcn)\right)+Bn\left(2a^2d^2-2abc\right.}{2bd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (-(a^2*B*d^2*n*Log[a + b*x]) + B*(b^2*c^2 - 2*a*b*c*d + 2*a^2*d^2)*n*Log[c
+ d*x] + d*(b*x*(2*a*A*d - b*B*c*n + a*B*d*n + A*b*d*x) + B*d*(2*a^2 + 2*a*
b*x + b^2*x^2)*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*b*d^2)
```

fricas [**B**] time = 1.11, size = 163, normalized size = 1.94

$$\frac{Ab^2d^2x^2+\left(2\,Aabd^2-\left(Bb^2cd-Babd^2\right)n\right)x+\left(Bb^2d^2nx^2+2\,Babd^2nx+Ba^2d^2n\right)\log(bx+a)-\left(Bb^2d^2nx^2+\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*x^2 + (2*A*a*b*d^2 - (B*b^2*c*d - B*a*b*d^2)*n)*x + (B*b^2*d
^2*n*x^2 + 2*B*a*b*d^2*n*x + B*a^2*d^2*n)*log(b*x + a) - (B*b^2*d^2*n*x^2 +
 2*B*a*b*d^2*n*x - (B*b^2*c^2 - 2*B*a*b*c*d)*n)*log(d*x + c) + (B*b^2*d^2*x
^2 + 2*B*a*b*d^2*x)*log(e))/(b*d^2)
```

giac [**A**] time = 0.58, size = 127, normalized size = 1.51

$$\frac{Ba^2n\log(bx+a)}{2\,b}+\frac{1}{2}\,(Ab+Bb)x^2+\frac{1}{2}\left(Bbnx^2+2\,Banx\right)\log(bx+a)-\frac{1}{2}\left(Bbnx^2+2\,Banx\right)\log(dx+c)-\frac{(Bbcn}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/2*B*a^2*n*log(b*x + a)/b + 1/2*(A*b + B*b)*x^2 + 1/2*(B*b*n*x^2 + 2*B*a*n
*x)*log(b*x + a) - 1/2*(B*b*n*x^2 + 2*B*a*n*x)*log(d*x + c) - 1/2*(B*b*c*n
- B*a*d*n - 2*A*a*d - 2*B*a*d)*x/d + 1/2*(B*b*c^2*n - 2*B*a*c*d*n)*log(d*x
+ c)/d^2
```

maple [**C**] time = 0.43, size = 817, normalized size = 9.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] ln((b*x+a)^n)*x*B*a-1/2*B*x*(b*x+2*a)*ln((d*x+c)^n)+A*a*x+1/2*A*b*x^2+B*ln(
e)*a*x+1/2*B*ln(e)*b*x^2+1/2*b*B*x^2*ln((b*x+a)^n)+1/2*B*a^2*n/b*ln(-b*x-a)
+1/4*I*b*B*Pi*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/4*I
*b*B*Pi*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a*
x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*a*x*csgn(I*(b*x+a)
^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*a*x*csgn(I/((d
*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a*x*csgn(I*(b*x+a)^n)*
csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/4*I*b*B*Pi*x^2*csgn(I*e)*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^2+1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^2+1/2*B*n*a*x-1/2*b/d*B*c*n*x-1/d*B*ln(d*x+c)*a*c*n+1
/2*b/d^2*B*ln(d*x+c)*c^2*n-1/4*I*b*B*Pi*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
^3-1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*a*x*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*a*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/
2*I*B*Pi*a*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)-1/2*I*B*Pi*a*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))-1/4*I*b*B*Pi*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n)*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
```

maxima [A] time = 1.23, size = 154, normalized size = 1.83

$$\frac{1}{2}\,Bbx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{2}\,Abx^2+Bax\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aax+\frac{\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)Ba}{e}-\left(\frac{a^2en\log(bx+a)}{b^2}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima")
```

```
[Out] 1/2*B*b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A*b*x^2 + B*a*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A*a*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d
)*B*a/e - 1/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e
*n - a*d*e*n)*x/(b*d))*B*b/e
```

mupad [B] time = 4.28, size = 127, normalized size = 1.51

$$\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\,\left(\frac{B\,b\,x^2}{2}+B\,a\,x\right)+x\,\left(\frac{4\,A\,a\,d+2\,A\,b\,c+B\,a\,d\,n-B\,b\,c\,n}{2\,d}-\frac{A\,\left(2\,a\,d+2\,b\,c\right)}{2\,d}\right)+\frac{\ln\left(c+d\,x\right)\,\left(B\,b\,c\right.}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))*(a + b*x),x)
```

```
[Out] log((e*(a + b*x)^n)/(c + d*x)^n)*(B*a*x + (B*b*x^2)/2) + x*((4*A*a*d + 2*A*
b*c + B*a*d*n - B*b*c*n)/(2*d) - (A*(2*a*d + 2*b*c))/(2*d)) + (log(c + d*x)
*(B*b*c^2*n - 2*B*a*c*d*n))/(2*d^2) + (A*b*x^2)/2 + (B*a^2*n*log(a + b*x))/
(2*b)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.151 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{a+bx}\,dx$

Optimal. Leaf size=79

$$\frac{Bn\text{Li}_2\left(\frac{bc-ad}{d(a+bx)}+1\right)}{b}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{b}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b+B*n*polylog(2,
1+(-a*d+b*c)/d/(b*x+a))/b
```

Rubi [A] time = 0.27, antiderivative size = 87, normalized size of antiderivative = 1.10, number of steps used = 7, number of rules used = 6, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {6742, 2488, 2411, 2343, 2333, 2315}

$$\frac{Bn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}+\frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x),x]
```

```
[Out] (A*Log[a + b*x])/b - (B*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b + (B*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\,dx &= \int \left(\frac{A}{a+bx}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\right)dx\\
&= \frac{A\log(a+bx)}{b}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\,dx\\
&= \frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{(B(bc-}{}\\
&= \frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{(B(bc-}{}\\
&= \frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{(B(bc-}{}\\
&= \frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{(B(bc-}{}\\
&= \frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{Bn\mathrm{Li}_2(}{b}
\end{aligned}
$$

Mathematica [A] time = 0.10, size = 129, normalized size = 1.63

$$
\frac{2A\log(a+bx)-2B\log\left(\frac{ad-bc}{d(a+bx)}\right)\left(\log\left(e(a+bx)^n(c+dx)^{-n}\right)+n\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2Bn\mathrm{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)-Bn\log^2\left(\frac{ad}{d(a}\right.}{2b}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x),x]
```

```
[Out] (-(B*n*Log[(-(b*c) + a*d)/(d*(a + b*x))]^2) + 2*A*Log[a + b*x] - 2*B*Log[(-
(b*c) + a*d)/(d*(a + b*x))]*(n*Log[(b*(c + d*x))/(b*c - a*d)] + Log[(e*(a +
 b*x)^n)/(c + d*x)^n]) + 2*B*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])/(2
*b)
```

fricas [F] time = 0.99, size = 0, normalized size = 0.00

$$
\mathrm{integral}\left(\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{bx+a}, x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*x + a), x)
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A}{bx + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*x + a), x)
```

maple [C]   time = 1.24, size = 523, normalized size = 6.62

$$-\frac{i\pi B\,\mathrm{csgn}\,(ie)\,\mathrm{csgn}\left(i\,(bx+a)^n\,(dx+c)^{-n}\right)\mathrm{csgn}\left(ie\,(bx+a)^n\,(dx+c)^{-n}\right)\ln\,(bx+a)}{2b}+\frac{i\pi B\,\mathrm{csgn}\,(ie)\,\mathrm{csgn}\bigl(ie\,(b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x)
```

```
[Out] -B/b*ln(b*x+a)*ln((d*x+c)^n)+1/b*B*n*dilog((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))
+1/b*B*n*ln(b*x+a)*ln((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))+1/2*I/b*B*ln(b*x+a)*
Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/b*B*ln(b*x+a)*Pi*csgn(
I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/b*B*ln(b*x+a)*Pi*csgn(I/
((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*
(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+A*ln(b*x+a)/b+1/b*
B*ln(b*x+a)*ln(e)+1/2/b*B/n*ln((b*x+a)^n)^2-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*(
b*x+a)^n/((d*x+c)^n))^3-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^3-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*(b*x+a)^n)*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
```

maxima [F]   time = 0.00, size = 0, normalized size = 0.00

$$B\Biggl(\frac{\log\,(bx+a)\log\left((bx+a)^n\right)-\log\,(bx+a)\log\left((dx+c)^n\right)}{b}+\int\frac{bdx\log(e)+bc\log(e)-(bcn-adn)\log\,(bx}{b^2dx^2+abc+\left(b^2c+abd\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x, algorithm="maxima")
```

```
[Out] B*((log(b*x + a)*log((b*x + a)^n) - log(b*x + a)*log((d*x + c)^n))/b + inte
grate((b*d*x*log(e) + b*c*log(e) - (b*c*n - a*d*n)*log(b*x + a))/(b^2*d*x^2
 + a*b*c + (b^2*c + a*b*d)*x), x)) + A*log(b*x + a)/b
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)}{a + b\,x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(a + b*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(a + b*x), x)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A + B \log\left(e\,(a + bx)^n\,(c + dx)^{-n}\right)}{a + bx}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a),x)
```

```
[Out] Integral((A + B*log(e*(a + b*x)**n*(c + d*x)**(-n)))/(a + b*x), x)
```

3.152 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^2}\,dx$

Optimal. Leaf size=97

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{b(a+bx)}-\frac{Bdn\log(a+bx)}{b(bc-ad)}+\frac{Bdn\log(c+dx)}{b(bc-ad)}-\frac{Bn}{b(a+bx)}$$

```
[Out] -B*n/b/(b*x+a)-B*d*n*ln(b*x+a)/b/(-a*d+b*c)+B*d*n*ln(d*x+c)/b/(-a*d+b*c)+(-
A-B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/(b*x+a)
```

Rubi [**A**] time = 0.08, antiderivative size = 72, normalized size of antiderivative = 0.74, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2490, 32}

$$-\frac{A}{b(a+bx)}-\frac{B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{Bn}{b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^2,x]
```

```
[Out] -(A/(b*(a + b*x))) - (B*n)/(b*(a + b*x)) - (B*(c + d*x)*Log[(e*(a + b*x)^n)
/(c + d*x)^n])/((b*c - a*d)*(a + b*x))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\,dx &= \int \left(\frac{A}{(a+bx)^2}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\right)dx\\ &= -\frac{A}{b(a+bx)}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\,dx\\ &= -\frac{A}{b(a+bx)}-\frac{B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)}+(Bn)\int \frac{1}{(a+bx}\\ &= -\frac{A}{b(a+bx)}-\frac{Bn}{b(a+bx)}-\frac{B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)}\end{aligned}$$

Mathematica [A] time = 0.09, size = 89, normalized size = 0.92

$$\frac{-(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A+Bn\right)+Bdn(a+bx)\log(c+dx)-Bdn(a+bx)\log(a+bx)}{b(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^2,x]
```

```
[Out] (-(B*d*n*(a + b*x)*Log[a + b*x]) + B*d*n*(a + b*x)*Log[c + d*x] - (b*c - a*
d)*(A + B*n + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b*(b*c - a*d)*(a + b*x)
)
```

fricas [A] time = 2.05, size = 107, normalized size = 1.10

$$-\frac{Abc-Aad+(Bbc-Bad)n+(Bbdnx+Bbcn)\log(bx+a)-(Bbdnx+Bbcn)\log(dx+c)+(Bbc-Bad)\log(e)}{ab^2c-a^2bd+\left(b^3c-ab^2d\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x, algorithm="fricas
")
```

```
[Out] -(A*b*c - A*a*d + (B*b*c - B*a*d)*n + (B*b*d*n*x + B*b*c*n)*log(b*x + a) -
(B*b*d*n*x + B*b*c*n)*log(d*x + c) + (B*b*c - B*a*d)*log(e))/(a*b^2*c - a^2
*b*d + (b^3*c - a*b^2*d)*x)
```

giac [A] time = 0.20, size = 108, normalized size = 1.11

$$-\frac{Bdn\log(bx+a)}{b^2c-abd}+\frac{Bdn\log(dx+c)}{b^2c-abd}-\frac{Bn\log(bx+a)}{b^2x+ab}+\frac{Bn\log(dx+c)}{b^2x+ab}-\frac{Bn+A+B}{b^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -B*d*n*log(b*x + a)/(b^2*c - a*b*d) + B*d*n*log(d*x + c)/(b^2*c - a*b*d) -
B*n*log(b*x + a)/(b^2*x + a*b) + B*n*log(d*x + c)/(b^2*x + a*b) - (B*n + A
+ B)/(b^2*x + a*b)
```

maple [C] time = 0.40, size = 823, normalized size = 8.48

$$\frac{B\ln\left((dx+c)^n\right)}{(bx+a)\,b}-\frac{2Abc+2Bbcn-2Badn-2Bad\ln(e)+2Bbc\ln(e)-2Bad\ln\left((bx+a)^n\right)+2Bbc\ln\left((bx+a)^n\right)-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x)
```

```
[Out] B/b/(b*x+a)*ln((d*x+c)^n)-1/2*(2*A*b*c+2*B*b*c*n-2*B*a*d*n-2*B*ln(e)*a*d+2*
B*ln(e)*b*c-2*B*a*d*ln((b*x+a)^n)+2*B*b*c*ln((b*x+a)^n)-2*A*a*d+I*B*Pi*b*c*
csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*B*ln(-b*x-a)*b*d*n*x-2*
B*ln(d*x+c)*b*d*n*x+I*B*Pi*b*c*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-
I*B*Pi*b*c*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^
n))-I*B*Pi*a*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*a*d*csgn(
I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*B*ln(-b*x-a)*a*d*n-2*B*ln(d*
x+c)*a*d*n+I*B*Pi*a*d*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)+I*B*Pi*a*d*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*
(b*x+a)^n/((d*x+c)^n))-I*B*Pi*b*c*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*Pi*b*c*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I
*B*Pi*b*c*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*B*Pi*b*c*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b*c*csgn(I*(b*x+a)^n/((d*x+c)^n))*cs
```

```
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*a*d*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^
3+I*B*Pi*a*d*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B*Pi*a*d*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a*d*csgn(I*(b*x+a)^n/((d*x+c)^n))*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2)/(b*x+a)/b/(-a*d+b*c)
```

maxima [A] time = 1.20, size = 116, normalized size = 1.20

$$-\frac{\left(\frac{den\log(bx+a)}{b^2c-abd}-\frac{den\log(dx+c)}{b^2c-abd}+\frac{en}{b^2x+ab}\right)B}{e}-\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}{b^2x+ab}-\frac{A}{b^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x, algorithm="maxima
")
```

```
[Out] -(d*e*n*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) +
 e*n/(b^2*x + a*b))*B/e - B*log((b*x + a)^n*e/(d*x + c)^n)/(b^2*x + a*b) -
A/(b^2*x + a*b)
```

mupad [B] time = 4.91, size = 97, normalized size = 1.00

$$-\frac{A+B\,n}{x\,b^2+a\,b}-\frac{B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)}{b\,(a+b\,x)}-\frac{B\,d\,n\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{b\,(a\,d-b\,c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(a + b*x)^2,x)
```

```
[Out] - (A + B*n)/(a*b + b^2*x) - (B*log((e*(a + b*x)^n)/(c + d*x)^n))/(b*(a + b*
x)) - (B*d*n*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*2i)/(b*(a*d - b*c))
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.153 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3}\,dx$

Optimal. Leaf size=137

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{2b(a+bx)^2}+\frac{Bd^2n\log(a+bx)}{2b(bc-ad)^2}-\frac{Bd^2n\log(c+dx)}{2b(bc-ad)^2}+\frac{Bdn}{2b(a+bx)(bc-ad)}-\frac{Bn}{4b(a+bx)^2}$$

```
[Out] -1/4*B*n/b/(b*x+a)^2+1/2*B*d*n/b/(-a*d+b*c)/(b*x+a)+1/2*B*d^2*n*ln(b*x+a)/b
/(-a*d+b*c)^2-1/2*B*d^2*n*ln(d*x+c)/b/(-a*d+b*c)^2+1/2*(-A-B*ln(e*(b*x+a)^n
/((d*x+c)^n)))/b/(b*x+a)^2
```

Rubi [A] time = 0.15, antiderivative size = 149, normalized size of antiderivative = 1.09, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 44}

$$-\frac{A}{2b(a+bx)^2}+\frac{Bd^2n\log(a+bx)}{2b(bc-ad)^2}-\frac{Bd^2n\log(c+dx)}{2b(bc-ad)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2}+\frac{Bdn}{2b(a+bx)(bc-ad)}-\frac{Bn}{4b(a+b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^3,x]
```

```
[Out] -A/(2*b*(a + b*x)^2) - (B*n)/(4*b*(a + b*x)^2) + (B*d*n)/(2*b*(b*c - a*d)*(
a + b*x)) + (B*d^2*n*Log[a + b*x])/(2*b*(b*c - a*d)^2) - (B*d^2*n*Log[c + d
*x])/(2*b*(b*c - a*d)^2) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(a + b
*x)^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\,dx = \int \left(\frac{A}{(a+bx)^3}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\right)dx$$

$$= -\frac{A}{2b(a+bx)^2}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\,dx$$

$$= -\frac{A}{2b(a+bx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2}+\frac{(B(bc-ad)n)\int \frac{}{(a+bx}}{2b}$$

$$= -\frac{A}{2b(a+bx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2}+\frac{(B(bc-ad)n)\int \Big(\frac{}{(bc-}}{}$$

$$= -\frac{A}{2b(a+bx)^2}-\frac{Bn}{4b(a+bx)^2}+\frac{Bdn}{2b(bc-ad)(a+bx)}+\frac{Bd^2n\log(a+}{2b(bc-ad)^2}$$

Mathematica [A] time = 0.31, size = 121, normalized size = 0.88

$$-\frac{\frac{2A}{(a+bx)^2}+Bn\left(-\frac{2d^2\log(a+bx)}{(bc-ad)^2}+\frac{2d^2\log(c+dx)}{(bc-ad)^2}+\frac{\frac{2d(a+bx)}{ad-bc}+1}{(a+bx)^2}\right)+\frac{2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^3,x]
```

```
[Out] -1/4*((2*A)/(a + b*x)^2 + B*n*((1 + (2*d*(a + b*x))/(-(b*c) + a*d))/(a + b*
x)^2 - (2*d^2*Log[a + b*x])/(b*c - a*d)^2 + (2*d^2*Log[c + d*x])/(b*c - a*d
)^2) + (2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^2)/b
```

fricas [B] time = 0.56, size = 296, normalized size = 2.16

$$-\frac{2\,Ab^2c^2-4\,Aabcd+2\,Aa^2d^2-2\left(Bb^2cd-Babd^2\right)nx+\left(Bb^2c^2-4\,Babcd+3\,Ba^2d^2\right)n-2\left(Bb^2d^2nx^2+2\,Ba\right.}{4\left(a^2b^3c^2-2\,a^3b^2cd+a^4bd^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*(2*A*b^2*c^2 - 4*A*a*b*c*d + 2*A*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2)*n
*x + (B*b^2*c^2 - 4*B*a*b*c*d + 3*B*a^2*d^2)*n - 2*(B*b^2*d^2*n*x^2 + 2*B*a
*b*d^2*n*x - (B*b^2*c^2 - 2*B*a*b*c*d)*n)*log(b*x + a) + 2*(B*b^2*d^2*n*x^2
 + 2*B*a*b*d^2*n*x - (B*b^2*c^2 - 2*B*a*b*c*d)*n)*log(d*x + c) + 2*(B*b^2*c
^2 - 2*B*a*b*c*d + B*a^2*d^2)*log(e))/(a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*
d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*
c*d + a^3*b^2*d^2)*x)
```

giac [A] time = 0.22, size = 239, normalized size = 1.74

$$\frac{Bd^2n\log(bx+a)}{2\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)}-\frac{Bd^2n\log(dx+c)}{2\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)}-\frac{Bn\log(bx+a)}{2\left(b^3x^2+2\,ab^2x+a^2b\right)}+\frac{Bn\log(dx+c)}{2\left(b^3x^2+2\,ab^2x+a^2b\right)}+\frac{2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/2*B*d^2*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 1/2*B*d^2*n*
log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 1/2*B*n*log(b*x + a)/(b^
3*x^2 + 2*a*b^2*x + a^2*b) + 1/2*B*n*log(d*x + c)/(b^3*x^2 + 2*a*b^2*x + a^
```

```
2*b) + 1/4*(2*B*b*d*n*x - B*b*c*n + 3*B*a*d*n - 2*A*b*c - 2*B*b*c + 2*A*a*d
 + 2*B*a*d)/(b^4*c*x^2 - a*b^3*d*x^2 + 2*a*b^3*c*x - 2*a^2*b^2*d*x + a^2*b^
2*c - a^3*b*d)
```

maple [C] time = 0.49, size = 1379, normalized size = 10.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x)
```

```
[Out] 1/2*B/b/(b*x+a)^2*ln((d*x+c)^n)-1/4*(2*A*b^2*c^2+2*I*B*Pi*a*b*c*d*csgn(I*e)
*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*a^2*d
^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+B*c^2*n*b^2+3*B*a^2*d^
2*n+2*A*a^2*d^2+2*B*ln(e)*b^2*c^2+2*B*ln(e)*a^2*d^2+2*B*a^2*d^2*ln((b*x+a)^
n)+2*B*b^2*c^2*ln((b*x+a)^n)+2*I*B*Pi*a*b*c*d*csgn(I*(b*x+a)^n/((d*x+c)^n))
^3+2*B*a*b*d^2*n*x-2*B*b^2*c*d*n*x-4*B*a*c*d*n*b+2*I*B*Pi*a*b*c*d*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^3-I*B*Pi*b^2*c^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*Pi*a^2*d^2*csgn(I*(b*x+a)^n)*csgn(
I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*B*Pi*a^2*d^2*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^3-I*B*Pi*b^2*c^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B*Pi*b^
2*c^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*B*Pi*a^2*d^2*csgn(I*(b*x+a)^n/((d
*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*b^2*c^2*csgn(I*e)*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*a^2*d^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+
2*I*B*Pi*a*b*c*d*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d
*x+c)^n))-2*B*a^2*n*ln(-b*x-a)*d^2+I*B*Pi*a^2*d^2*csgn(I/((d*x+c)^n))*csgn(
I*(b*x+a)^n/((d*x+c)^n))^2-4*A*a*b*c*d-4*B*a*b*c*d*ln((b*x+a)^n)+2*B*ln(d*x
+c)*a^2*d^2*n-2*B*ln(-b*x-a)*b^2*d^2*n*x^2+2*B*ln(d*x+c)*b^2*d^2*n*x^2-2*I*
B*Pi*a*b*c*d*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi*a*b
*c*d*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2*c^2*csg
n(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2*c^2*csgn(I/((d*x+
c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2*c^2*csgn(I*(b*x+a)^n/((d*
x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*a^2*d^2*csgn(I*e)*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*a*b*c*d*csgn(I*(b*x+a)^n/((d*x+c)^n))*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-4*B*ln(-b*x-a)*a*b*d^2*n*x+4*B*ln(d*x+c)*a
*b*d^2*n*x-I*B*Pi*a^2*d^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)-2*I*B*Pi*a*b*c*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^2-4*B*ln(e)*a*b*c*d-I*B*Pi*b^2*c^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)
^n))*csgn(I*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2/(-a*d+b*c)^2/b
```

maxima [A] time = 1.38, size = 230, normalized size = 1.68

$$\frac{\left(\frac{2\,d^{2}en\log(bx+a)}{b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}}-\frac{2\,d^{2}en\log(dx+c)}{b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}}+\frac{2\,bdenx-bcen+3\,aden}{a^{2}b^{2}c-a^{3}bd+\left(b^{4}c-ab^{3}d\right)x^{2}+2\,\left(ab^{3}c-a^{2}b^{2}d\right)x}\right)B}{4\,e}-\frac{B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)}{2\,\left(b^{3}x^{2}+2\,ab^{2}x+a^{2}b\right)}-\frac{\;}{2\,(b^{3}x^{2}+2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x, algorithm="maxima
")
```

```
[Out] 1/4*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*d^2*e*n
*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b*c*e*n
+ 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*x))*B/e - 1/2*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^3*x^2 + 2*a*b^2*
x + a^2*b) - 1/2*A/(b^3*x^2 + 2*a*b^2*x + a^2*b)
```

mupad [B] time = 4.66, size = 192, normalized size = 1.40

$$-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c+3\,B\,a\,d\,n-B\,b\,c\,n}{2\,(a\,d-b\,c)}+\frac{B\,b\,d\,n\,x}{a\,d-b\,c}}{2\,a^{2}\,b+4\,a\,b^{2}\,x+2\,b^{3}\,x^{2}}-\frac{B\,\ln\left(\frac{e\,(a+b\,x)^{n}}{(c+d\,x)^{n}}\right)}{2\,b\,\left(a^{2}+2\,a\,b\,x+b^{2}\,x^{2}\right)}-\frac{B\,d^{2}\,n\,\mathrm{atanh}\left(\frac{2\,b^{3}\,c^{2}-2\,a^{2}\,b\,d^{2}}{2\,b\,(a\,d-b\,c)^{2}}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{b\,(a\,d-b\,c)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(a + b*x)^3,x)
```

```
[Out] - ((2*A*a*d - 2*A*b*c + 3*B*a*d*n - B*b*c*n)/(2*(a*d - b*c)) + (B*b*d*n*x)/
(a*d - b*c))/(2*a^2*b + 2*b^3*x^2 + 4*a*b^2*x) - (B*log((e*(a + b*x)^n)/(c
+ d*x)^n))/(2*b*(a^2 + b^2*x^2 + 2*a*b*x)) - (B*d^2*n*atanh((2*b^3*c^2 - 2*
a^2*b*d^2)/(2*b*(a*d - b*c)^2) - (2*b*d*x)/(a*d - b*c)))/(b*(a*d - b*c)^2)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**3,x)
```

```
[Out] Timed out
```

3.154 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4}\,dx$

Optimal. Leaf size=166

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{3b(a+bx)^3}-\frac{Bd^3n\log(a+bx)}{3b(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3b(bc-ad)^3}-\frac{Bd^2n}{3b(a+bx)(bc-ad)^2}+\frac{Bdn}{6b(a+bx)^2(bc-}$$

```
[Out] -1/9*B*n/b/(b*x+a)^3+1/6*B*d*n/b/(-a*d+b*c)/(b*x+a)^2-1/3*B*d^2*n/b/(-a*d+b
*c)^2/(b*x+a)-1/3*B*d^3*n*ln(b*x+a)/b/(-a*d+b*c)^3+1/3*B*d^3*n*ln(d*x+c)/b/
(-a*d+b*c)^3+1/3*(-A-B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/(b*x+a)^3
```

Rubi [A] time = 0.17, antiderivative size = 178, normalized size of antiderivative = 1.07, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = $\{6742, 2492, 44\}$

$$-\frac{A}{3b(a+bx)^3}-\frac{Bd^2n}{3b(a+bx)(bc-ad)^2}-\frac{Bd^3n\log(a+bx)}{3b(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3b(bc-ad)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3}+\frac{}{6b(a+}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^4,x]
```

```
[Out] -A/(3*b*(a + b*x)^3) - (B*n)/(9*b*(a + b*x)^3) + (B*d*n)/(6*b*(b*c - a*d)*(
a + b*x)^2) - (B*d^2*n)/(3*b*(b*c - a*d)^2*(a + b*x)) - (B*d^3*n*Log[a + b*
x])/(3*b*(b*c - a*d)^3) + (B*d^3*n*Log[c + d*x])/(3*b*(b*c - a*d)^3) - (B*L
og[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(a + b*x)^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\,dx = \int \left(\frac{A}{(a+bx)^4}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\right)dx$$

$$= -\frac{A}{3b(a+bx)^3}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\,dx$$

$$= -\frac{A}{3b(a+bx)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3}+\frac{(B(bc-ad)n)\int \frac{}{(a+bx}}{3b}$$

$$= -\frac{A}{3b(a+bx)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3}+\frac{(B(bc-ad)n)\int \Big(\frac{}{(bc-}}{}$$

$$= -\frac{A}{3b(a+bx)^3}-\frac{Bn}{9b(a+bx)^3}+\frac{Bdn}{6b(bc-ad)(a+bx)^2}-\frac{Bd^2n}{3b(bc-ad)^2(}$$

Mathematica [**A**] time = 0.38, size = 143, normalized size = 0.86

$$-\frac{\frac{6A}{(a+bx)^3}+Bn\left(\frac{6d^3\log(a+bx)}{(bc-ad)^3}-\frac{6d^3\log(c+dx)}{(bc-ad)^3}+\frac{\frac{6d^2(a+bx)^2}{(bc-ad)^2}+\frac{3d(a+bx)}{ad-bc}+2}{(a+bx)^3}\right)+\frac{6B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3}}{18b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^4,x]
```

```
[Out] -1/18*((6*A)/(a + b*x)^3 + B*n*((2 + (3*d*(a + b*x))/(-(b*c) + a*d) + (6*d^
2*(a + b*x)^2)/(b*c - a*d)^2)/(a + b*x)^3 + (6*d^3*Log[a + b*x])/(b*c - a*d
)^3 - (6*d^3*Log[c + d*x])/(b*c - a*d)^3) + (6*B*Log[(e*(a + b*x)^n)/(c + d
*x)^n])/(a + b*x)^3)/b
```

fricas [**B**] time = 0.61, size = 540, normalized size = 3.25

$$-\frac{6\,Ab^3c^3-18\,Aab^2c^2d+18\,Aa^2bcd^2-6\,Aa^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)nx^2-3\left(Bb^3c^2d-6\,Bab^2cd^2+5\,Ba^2bd\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x, algorithm="fricas
")
```

```
[Out] -1/18*(6*A*b^3*c^3 - 18*A*a*b^2*c^2*d + 18*A*a^2*b*c*d^2 - 6*A*a^3*d^3 + 6*
(B*b^3*c*d^2 - B*a*b^2*d^3)*n*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + 5*B*
a^2*b*d^3)*n*x + (2*B*b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2 - 11*B*a
^3*d^3)*n + 6*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x +
(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log(b*x + a) - 6*(B*b^3*
d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x + (B*b^3*c^3 - 3*B*a*b^
2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log(d*x + c) + 6*(B*b^3*c^3 - 3*B*a*b^2*c^2*d
 + 3*B*a^2*b*c*d^2 - B*a^3*d^3)*log(e))/(a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*
a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3
*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^
3)*x)
```

giac [**B**] time = 0.23, size = 448, normalized size = 2.70

$$-\frac{Bd^3n\log(bx+a)}{3\left(b^4c^3-3\,ab^3c^2d+3\,a^2b^2cd^2-a^3bd^3\right)}+\frac{Bd^3n\log(dx+c)}{3\left(b^4c^3-3\,ab^3c^2d+3\,a^2b^2cd^2-a^3bd^3\right)}-\frac{Bn\log(bx+a)}{3\left(b^4x^3+3\,ab^3x^2+3\,a^2b^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x, algorithm="giac")
```

```
[Out] -1/3*B*d^3*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*
b*d^3) + 1/3*B*d^3*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^
2 - a^3*b*d^3) - 1/3*B*n*log(b*x + a)/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x
+ a^3*b) + 1/3*B*n*log(d*x + c)/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*
b) - 1/18*(6*B*b^2*d^2*n*x^2 - 3*B*b^2*c*d*n*x + 15*B*a*b*d^2*n*x + 2*B*b^2
*c^2*n - 7*B*a*b*c*d*n + 11*B*a^2*d^2*n + 6*A*b^2*c^2 + 6*B*b^2*c^2 - 12*A*
a*b*c*d - 12*B*a*b*c*d + 6*A*a^2*d^2 + 6*B*a^2*d^2)/(b^6*c^2*x^3 - 2*a*b^5*
c*d*x^3 + a^2*b^4*d^2*x^3 + 3*a*b^5*c^2*x^2 - 6*a^2*b^4*c*d*x^2 + 3*a^3*b^3
*d^2*x^2 + 3*a^2*b^4*c^2*x - 6*a^3*b^3*c*d*x + 3*a^4*b^2*d^2*x + a^3*b^3*c^
2 - 2*a^4*b^2*c*d + a^5*b*d^2)
```

maple [C] time = 0.58, size = 1976, normalized size = 11.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x)
```

```
[Out] 1/3*B/b/(b*x+a)^3*ln((d*x+c)^n)-1/18*(-6*B*a^3*d^3*ln((b*x+a)^n)+6*B*b^3*c^
3*ln((b*x+a)^n)+6*A*b^3*c^3+9*I*B*Pi*a^2*b*c*d^2*csgn(I*e)*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^2+9*I*B*Pi*a^2*b*c*d^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^2+2*B*c^3*n*b^3-11*B*a^3*d^3*n-6*A*a^3*d^3+9*I*B*Pi*a*b^2*c^2*d
*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+3*I*B*
Pi*b^3*c^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3*I*B*Pi*b^3*c^3*csg
n(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+3*I*B*Pi*b^3*c^3*csgn(I/((d*
x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+6*B*ln(-b*x-a)*b^3*d^3*n*x^3-6*B*l
n(d*x+c)*b^3*d^3*n*x^3+3*I*B*Pi*a^3*d^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-6*B*ln(e)*a^3*d^3+6*B*ln(e)*b^3*c^3-9*
B*a*c^2*d*n*b^2+18*B*a^2*c*d^2*n*b+18*B*ln(-b*x-a)*a*b^2*d^3*n*x^2-18*B*ln(
d*x+c)*a*b^2*d^3*n*x^2+18*B*ln(-b*x-a)*a^2*b*d^3*n*x-18*B*ln(d*x+c)*a^2*b*d
^3*n*x+18*B*ln(e)*a^2*b*c*d^2-18*B*ln(e)*a*b^2*c^2*d+18*B*a*b^2*c*d^2*n*x-3
*I*B*Pi*b^3*c^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n
)*(b*x+a)^n)-3*I*B*Pi*b^3*c^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*
(b*x+a)^n/((d*x+c)^n))-9*I*B*Pi*a^2*b*c*d^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*
x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-9*I*B*Pi*a^2*b*c*d^2*csgn(I*(b*x+a
)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+9*I*B*Pi*a*b^2*c^2*d
*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-9*
I*B*Pi*a*b^2*c^2*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-9*I*B*Pi*a*b
^2*c^2*d*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-9*I*B*Pi*a*b^2*c
^2*d*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-9*I*B*Pi*a*b^2*c^2
*d*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-3*I*B*Pi
*a^3*d^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-3*I*B*Pi*a^3*d^3
*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-3*I*B*Pi*a^3*d^3*csgn(
I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+6*B*a^3*n*ln(-b*
x-a)*d^3-6*B*ln(d*x+c)*a^3*d^3*n+18*A*a^2*b*c*d^2-18*A*a*b^2*c^2*d+3*I*B*Pi
*b^3*c^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3*
I*B*Pi*a^3*d^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x
+c)^n))-6*B*a*b^2*d^3*n*x^2+6*B*b^3*c*d^2*n*x^2-15*B*a^2*b*d^3*n*x+9*I*B*Pi
*a^2*b*c*d^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+9*I*B*Pi*a
^2*b*c*d^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-
3*I*B*Pi*a^3*d^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-3*B*b^3*c^2*d*
n*x+18*B*a^2*b*c*d^2*ln((b*x+a)^n)-18*B*a*b^2*c^2*d*ln((b*x+a)^n)+3*I*B*Pi*
a^3*d^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+3*I*B*Pi*a^3*d^3*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)^3-3*I*B*Pi*b^3*c^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-3*I*B*Pi*b
^3*c^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-9*I*B*Pi*a^2*b*c*d^2*csgn(I*(b*x+a
)^n/((d*x+c)^n))^3-9*I*B*Pi*a^2*b*c*d^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+9
```

```
*I*B*Pi*a*b^2*c^2*d*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+9*I*B*Pi*a*b^2*c^2*d*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^3)/(b*x+a)^3/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(-a*
d+b*c)/b
```

maxima [B] time = 1.29, size = 400, normalized size = 2.41

$$-\frac{\left(\frac{6\,d^{3}en\log(bx+a)}{b^{4}c^{3}-3\,ab^{3}c^{2}d+3\,a^{2}b^{2}cd^{2}-a^{3}bd^{3}}-\frac{6\,d^{3}en\log(dx+c)}{b^{4}c^{3}-3\,ab^{3}c^{2}d+3\,a^{2}b^{2}cd^{2}-a^{3}bd^{3}}+\frac{6\,b^{2}d^{2}enx^{2}+2\,b^{2}c^{2}en-7\,abcden+11\,a^{2}d^{2}en-3}{a^{3}b^{3}c^{2}-2\,a^{4}b^{2}cd+a^{5}bd^{2}+\left(b^{6}c^{2}-2\,ab^{5}cd+a^{2}b^{4}d^{2}\right)x^{3}+3\,\left(ab^{5}c^{2}-2\,a^{2}b^{4}c\right.}\right.}{18\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x, algorithm="maxima
")
```

```
[Out] -1/18*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*n + 11*
a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^4*b^2*c
*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^5*c^2 -
 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^
2*d^2)*x))*B/e - 1/3*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^4*x^3 + 3*a*b^3*x^
2 + 3*a^2*b^2*x + a^3*b) - 1/3*A/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3
*b)
```

mupad [B] time = 4.91, size = 317, normalized size = 1.91

$$\frac{2\,A\,a\,c\,d}{3\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{A\,b\,c^2}{3\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)}{3\,b\,{\left(a+b\,x\right)}^3}-\frac{A\,a^2\,d^2}{3\,b\,{\left(a\,d-b\,c\right)}^2\,{\left(a+b\,x\right)}^3}-\frac{B\,b\,c^2\,n}{9\,{\left(a\,d-b\,c\right)}^2\,(a+b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(a + b*x)^4,x)
```

```
[Out] (2*A*a*c*d)/(3*(a*d - b*c)^2*(a + b*x)^3) - (A*b*c^2)/(3*(a*d - b*c)^2*(a +
 b*x)^3) - (B*log((e*(a + b*x)^n)/(c + d*x)^n))/(3*b*(a + b*x)^3) - (A*a^2*
d^2)/(3*b*(a*d - b*c)^2*(a + b*x)^3) - (B*b*c^2*n)/(9*(a*d - b*c)^2*(a + b*
x)^3) - (B*d^3*n*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(3*b*(a
*d - b*c)^3) - (5*B*a*d^2*n*x)/(6*(a*d - b*c)^2*(a + b*x)^3) - (B*b*d^2*n*x
^2)/(3*(a*d - b*c)^2*(a + b*x)^3) + (7*B*a*c*d*n)/(18*(a*d - b*c)^2*(a + b*
x)^3) - (11*B*a^2*d^2*n)/(18*b*(a*d - b*c)^2*(a + b*x)^3) + (B*b*c*d*n*x)/(
6*(a*d - b*c)^2*(a + b*x)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**4,x)
```

```
[Out] Timed out
```

3.155 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^5}\,dx$

Optimal. Leaf size=195

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{4b(a+bx)^4}+\frac{Bd^4n\log(a+bx)}{4b(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4b(bc-ad)^4}+\frac{Bd^3n}{4b(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8b(a+bx)^2(bc-}$$

```
[Out] -1/16*B*n/b/(b*x+a)^4+1/12*B*d*n/b/(-a*d+b*c)/(b*x+a)^3-1/8*B*d^2*n/b/(-a*d
+b*c)^2/(b*x+a)^2+1/4*B*d^3*n/b/(-a*d+b*c)^3/(b*x+a)+1/4*B*d^4*n*ln(b*x+a)/
b/(-a*d+b*c)^4-1/4*B*d^4*n*ln(d*x+c)/b/(-a*d+b*c)^4+1/4*(-A-B*ln(e*(b*x+a)^
n/((d*x+c)^n)))/b/(b*x+a)^4
```

Rubi [A] time = 0.19, antiderivative size = 207, normalized size of antiderivative = 1.06, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {6742, 2492, 44}

$$-\frac{A}{4b(a+bx)^4}+\frac{Bd^3n}{4b(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8b(a+bx)^2(bc-ad)^2}+\frac{Bd^4n\log(a+bx)}{4b(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4b(bc-ad)^4}-\frac{B\log\left(e(a+b\right.}{4b(a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^5,x]
```

```
[Out] -A/(4*b*(a + b*x)^4) - (B*n)/(16*b*(a + b*x)^4) + (B*d*n)/(12*b*(b*c - a*d)
*(a + b*x)^3) - (B*d^2*n)/(8*b*(b*c - a*d)^2*(a + b*x)^2) + (B*d^3*n)/(4*b*
(b*c - a*d)^3*(a + b*x)) + (B*d^4*n*Log[a + b*x])/(4*b*(b*c - a*d)^4) - (B*
d^4*n*Log[c + d*x])/(4*b*(b*c - a*d)^4) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/(4*b*(a + b*x)^4)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\,dx &= \int \left(\frac{A}{(a+bx)^5}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\right)dx\\ &= -\frac{A}{4b(a+bx)^4}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\,dx\\ &= -\frac{A}{4b(a+bx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b(a+bx)^4}+\frac{(B(bc-ad)n)\int \frac{}{(a+bx}}{4b}\\ &= -\frac{A}{4b(a+bx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b(a+bx)^4}+\frac{(B(bc-ad)n)\int \Big(\frac{}{(bc-}}{}\\ &= -\frac{A}{4b(a+bx)^4}-\frac{Bn}{16b(a+bx)^4}+\frac{Bdn}{12b(bc-ad)(a+bx)^3}-\frac{Bd^2}{8b(bc-ad)}\end{aligned}$$

Mathematica [A] time = 0.36, size = 165, normalized size = 0.85

$$-\frac{\frac{12A}{(a+bx)^4}+Bn\left(-\frac{12d^4\log(a+bx)}{(bc-ad)^4}+\frac{12d^4\log(c+dx)}{(bc-ad)^4}+\frac{-\frac{12d^3(a+bx)^3}{(bc-ad)^3}+\frac{6d^2(a+bx)^2}{(bc-ad)^2}+\frac{4d(a+bx)}{ad-bc}+3}{(a+bx)^4}\right)+\frac{12B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4}}{48b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^5,x]
```

```
[Out] -1/48*((12*A)/(a + b*x)^4 + B*n*((3 + (4*d*(a + b*x))/(-(b*c) + a*d) + (6*d
^2*(a + b*x)^2)/(b*c - a*d)^2 - (12*d^3*(a + b*x)^3)/(b*c - a*d)^3)/(a + b*
x)^4 - (12*d^4*Log[a + b*x])/(b*c - a*d)^4 + (12*d^4*Log[c + d*x])/(b*c - a
*d)^4) + (12*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^4)/b
```

fricas [B] time = 1.52, size = 820, normalized size = 4.21

$$-\frac{12\,Ab^4c^4-48\,Aab^3c^3d+72\,Aa^2b^2c^2d^2-48\,Aa^3bcd^3+12\,Aa^4d^4-12\left(Bb^4cd^3-Bab^3d^4\right)nx^3+6\left(Bb^4c^2d^2-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x, algorithm="fricas
")
```

```
[Out] -1/48*(12*A*b^4*c^4 - 48*A*a*b^3*c^3*d + 72*A*a^2*b^2*c^2*d^2 - 48*A*a^3*b*
c*d^3 + 12*A*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*n*x^3 + 6*(B*b^4*c^2*
d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4)*n*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3
*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*b*d^4)*n*x + (3*B*b^4*c^4 - 16*B*a
*b^3*c^3*d + 36*B*a^2*b^2*c^2*d^2 - 48*B*a^3*b*c*d^3 + 25*B*a^4*d^4)*n - 12
*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2*b^2*d^4*n*x^2 + 4*B*a^3*b
*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c
*d^3)*n)*log(b*x + a) + 12*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2
*b^2*d^4*n*x^2 + 4*B*a^3*b*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2
*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*n)*log(d*x + c) + 12*(B*b^4*c^4 - 4*B*a*b^3
*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B*a^4*d^4)*log(e))/(a^4*b^
5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 +
 (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d
^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*
d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d
^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d
+ 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)
```

giac [B] time = 0.25, size = 710, normalized size = 3.64

$$\frac{Bd^4n\log\left(bx+a\right)}{4\left(b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4\right)}-\frac{Bd^4n\log\left(dx+c\right)}{4\left(b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4\right)}-4\left(b^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x, algorithm="giac")
```

```
[Out] 1/4*B*d^4*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a
^3*b^2*c*d^3 + a^4*b*d^4) - 1/4*B*d^4*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3
*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 1/4*B*n*log(b*x + a
)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) + 1/4*B*n*l
og(d*x + c)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) +
 1/48*(12*B*b^3*d^3*n*x^3 - 6*B*b^3*c*d^2*n*x^2 + 42*B*a*b^2*d^3*n*x^2 + 4*
B*b^3*c^2*d*n*x - 20*B*a*b^2*c*d^2*n*x + 52*B*a^2*b*d^3*n*x - 3*B*b^3*c^3*n
 + 13*B*a*b^2*c^2*d*n - 23*B*a^2*b*c*d^2*n + 25*B*a^3*d^3*n - 12*A*b^3*c^3
- 12*B*b^3*c^3 + 36*A*a*b^2*c^2*d + 36*B*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 3
6*B*a^2*b*c*d^2 + 12*A*a^3*d^3 + 12*B*a^3*d^3)/(b^8*c^3*x^4 - 3*a*b^7*c^2*d
*x^4 + 3*a^2*b^6*c*d^2*x^4 - a^3*b^5*d^3*x^4 + 4*a*b^7*c^3*x^3 - 12*a^2*b^6
*c^2*d*x^3 + 12*a^3*b^5*c*d^2*x^3 - 4*a^4*b^4*d^3*x^3 + 6*a^2*b^6*c^3*x^2 -
 18*a^3*b^5*c^2*d*x^2 + 18*a^4*b^4*c*d^2*x^2 - 6*a^5*b^3*d^3*x^2 + 4*a^3*b^
5*c^3*x - 12*a^4*b^4*c^2*d*x + 12*a^5*b^3*c*d^2*x - 4*a^6*b^2*d^3*x + a^4*b
^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
```

maple [C] time = 0.67, size = 2583, normalized size = 13.25

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x)
```

```
[Out] 1/4*B/b/(b*x+a)^4*ln((d*x+c)^n)+1/48*(-12*A*b^4*c^4-3*B*b^4*c^4*n-12*A*a^4*
d^4-24*I*B*Pi*a*b^3*c^3*d*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)-24*I*B*Pi*a*b^3*c^3*d*csgn(I*(b*x+a)^n)*csgn(I/((d*x
+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-12*B*a^4*d^4*ln((b*x+a)^n)-12*B*b^4*c
^4*ln((b*x+a)^n)+48*B*a*b^3*c^3*d*ln((b*x+a)^n)-36*I*B*Pi*a^2*b^2*c^2*d^2*c
sgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-12*B*ln(e)*a
^4*d^4-12*B*ln(e)*b^4*c^4+48*B*a^3*b*c*d^3*n-36*I*B*Pi*a^2*b^2*c^2*d^2*csgn
(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-6*I*B*Pi*b^4*c^4*csgn(I*e)*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-6*I*B*Pi*b^4*c^4*csgn(I*(b*x+a)^n)*csgn(I*(
b*x+a)^n/((d*x+c)^n))^2+48*B*a*b^3*c*d^3*n*x^2+72*B*a^2*b^2*c*d^3*n*x-24*B*
a*b^3*c^2*d^2*n*x+6*I*B*Pi*b^4*c^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+6*I*B*Pi*b^4*c^4*csgn(I*(b*x+a)^n)*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+24*I*B*Pi*a^3*b*c*d^3*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-6*I*B*Pi*a^4*d^4*csgn(
I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-36*I*B*Pi*a^2*b^
2*c^2*d^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-6*I*B*Pi*a^4*
d^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-6*I*B*Pi*a^4*d^4*csgn
(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-48*B*ln(d*x+c)*a*b^3*d^4*n*
x^3+48*B*ln(-b*x-a)*a*b^3*d^4*n*x^3-72*B*ln(d*x+c)*a^2*b^2*d^4*n*x^2+72*B*l
n(-b*x-a)*a^2*b^2*d^4*n*x^2-48*B*ln(d*x+c)*a^3*b*d^4*n*x+48*B*ln(-b*x-a)*a^
3*b*d^4*n*x-25*B*a^4*d^4*n+12*B*a^4*n*ln(-b*x-a)*d^4-12*B*ln(d*x+c)*a^4*d^4
*n+6*I*B*Pi*a^4*d^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))-24*I*B*Pi*a^3*b*c*d^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-24*I*B*P
i*a^3*b*c*d^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+36*I*B*Pi*a^2*b^2*c^2*d^2*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^3+48*B*ln(e)*a^3*b*c*d^3-72*B*ln(e)*a^2*b^2*c^
2*d^2+48*B*ln(e)*a*b^3*c^3*d+48*A*a^3*b*c*d^3-72*A*a^2*b^2*c^2*d^2+48*A*a*b
^3*c^3*d+6*I*B*Pi*a^4*d^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
```

```
((d*x+c)^n)*(b*x+a)^n)+24*I*B*Pi*a*b^3*c^3*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^2+36*I*B*Pi*a^2*b^2*c^2*d^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-2
4*I*B*Pi*a*b^3*c^3*d*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-24*I*B*Pi*a*b^3*c^3*d*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+24*I*B*Pi*a*b^3*c^3*d*csgn(I*(b*x+a)^n/((
d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+6*I*B*Pi*a^4*d^4*csgn(I*(b*x+a
)^n/((d*x+c)^n))^3+6*I*B*Pi*a^4*d^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+6*I*B
*Pi*b^4*c^4*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+6*I*B*Pi*b^4*c^4*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^3+48*B*a^3*b*c*d^3*ln((b*x+a)^n)-72*B*a^2*b^2*c^2*d^2*ln(
(b*x+a)^n)-6*I*B*Pi*b^4*c^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n
))^2-6*I*B*Pi*b^4*c^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)^2-6*I*B*Pi*a^4*d^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+24*
I*B*Pi*a^3*b*c*d^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-24*I*B*Pi*a^
3*b*c*d^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)-24*I*B*Pi*a^3*b*c*d^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(
b*x+a)^n/((d*x+c)^n))+24*I*B*Pi*a^3*b*c*d^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x
+a)^n/((d*x+c)^n))^2-36*B*a^2*b^2*c^2*d^2*n+16*B*a*b^3*c^3*d*n-12*B*a*b^3*d
^4*n*x^3+12*B*b^4*c*d^3*n*x^3-42*B*a^2*b^2*d^4*n*x^2+36*I*B*Pi*a^2*b^2*c^2*
d^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
+24*I*B*Pi*a^3*b*c*d^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-12
*B*ln(d*x+c)*b^4*d^4*n*x^4+12*B*ln(-b*x-a)*b^4*d^4*n*x^4+36*I*B*Pi*a^2*b^2*
c^2*d^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
+24*I*B*Pi*a*b^3*c^3*d*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+
24*I*B*Pi*a*b^3*c^3*d*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-6*B
*b^4*c^2*d^2*n*x^2-52*B*a^3*b*d^4*n*x+4*B*b^4*c^3*d*n*x-36*I*B*Pi*a^2*b^2*c
^2*d^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2)/(b*x+a)^4/(-a^3*d^3+3*a
^2*b*c*d^2-3*a*b^2*c^2*d+b^3*c^3)/(-a*d+b*c)/b
```

maxima [**B**] time = 1.38, size = 618, normalized size = 3.17

$$\left(\frac{12\,d^4en\log(bx+a)}{b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4}-\frac{12\,d^4en\log(dx+c)}{b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4}+\frac{12\,b^3d^3}{a^4b^4c^3-3\,a^5b^3c^2d+3\,a^6b^2cd^2-a^7bd^3+\left(b^8c^3-3\,a\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x, algorithm="maxima
")
```

```
[Out] 1/48*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2
- 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4
*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n
*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3
*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2
*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^
2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*
x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2
 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*B/
e - 1/4*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3
*x^2 + 4*a^3*b^2*x + a^4*b) - 1/4*A/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2
+ 4*a^3*b^2*x + a^4*b)
```

mupad [**B**] time = 5.33, size = 555, normalized size = 2.85

$$-\frac{\frac{12\,A\,a^3\,d^3-12\,A\,b^3\,c^3+25\,B\,a^3\,d^3\,n-3\,B\,b^3\,c^3\,n+36\,A\,a\,b^2\,c^2\,d-36\,A\,a^2\,b\,c\,d^2+13\,B\,a\,b^2\,c^2\,d\,n-23\,B\,a^2\,b\,c\,d^2\,n}{12\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}+\frac{d\,x\,\left(13\,B\,n\,a^2\,b\,d^2-5\,B\,n\,a\,b^2\,c\,d+\right.}{3\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-\right.}}{4\,a^4\,b+16\,a^3\,b^2\,x+24\,a^2\,b^3\,x^2+16\,a\,b^4\,x^3+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(a + b*x)^5,x)
```

```
[Out] - ((12*A*a^3*d^3 - 12*A*b^3*c^3 + 25*B*a^3*d^3*n - 3*B*b^3*c^3*n + 36*A*a*b
^2*c^2*d - 36*A*a^2*b*c*d^2 + 13*B*a*b^2*c^2*d*n - 23*B*a^2*b*c*d^2*n)/(12*
(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d*x*(B*b^3*c^2*n +
13*B*a^2*b*d^2*n - 5*B*a*b^2*c*d*n))/(3*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d
- 3*a^2*b*c*d^2)) - (d^2*x^2*(B*b^3*c*n - 7*B*a*b^2*d*n))/(2*(a^3*d^3 - b^3
*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (B*b^3*d^3*n*x^3)/(a^3*d^3 - b^3*c
^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))/(4*a^4*b + 4*b^5*x^4 + 16*a^3*b^2*x +
16*a*b^4*x^3 + 24*a^2*b^3*x^2) - (B*log((e*(a + b*x)^n)/(c + d*x)^n))/(4*b*
(a^4 + b^4*x^4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x)) - (B*d^4*n*atanh
((4*b^5*c^4 - 4*a^4*b*d^4 + 8*a^3*b^2*c*d^3 - 8*a*b^4*c^3*d)/(4*b*(a*d - b*
c)^4) - (2*b*d*x*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))/(a*d
- b*c)^4))/(2*b*(a*d - b*c)^4)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**5,x)
```

```
[Out] Timed out
```

3.156 $\int (a+bx)^3 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx$

Optimal. Leaf size=322

$$-\frac{Bn(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+6A+11Bn\right)}{12bd^4}-\frac{Bn(a+bx)(bc-ad)^3\bigl(6B\log(e(a+}{12bd^3}$$

```
[Out] -1/6*B*(-a*d+b*c)*n*(b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d+1/4*(b*
x+a)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b+1/12*B*(-a*d+b*c)^2*n*(b*x+a)^
2*(3*A+B*n+3*B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^2-1/12*B*(-a*d+b*c)^3*n*(b*
x+a)*(6*A+5*B*n+6*B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^3-1/12*B*(-a*d+b*c)^4*
n*ln((-a*d+b*c)/b/(d*x+c))*(6*A+11*B*n+6*B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d
^4-1/2*B^2*(-a*d+b*c)^4*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^4
```

Rubi [A] time = 0.77, antiderivative size = 542, normalized size of antiderivative = 1.68, number of steps used = 21, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{B^2n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{2bd^4}+\frac{A^2(a+bx)^4}{4b}-\frac{ABnx(bc-ad)^3}{2d^3}+\frac{ABn(a+bx)^2(bc-ad)^2}{4bd^2}+\frac{ABn(bc-ad}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*n*x)/(2*d^3) - (5*B^2*(b*c - a*d)^3*n^2*x)/(12*d^3) + (
A*B*(b*c - a*d)^2*n*(a + b*x)^2)/(4*b*d^2) + (B^2*(b*c - a*d)^2*n^2*(a + b*
x)^2)/(12*b*d^2) - (A*B*(b*c - a*d)*n*(a + b*x)^3)/(6*b*d) + (A^2*(a + b*x)
^4)/(4*b) + (A*B*(b*c - a*d)^4*n*Log[c + d*x])/(2*b*d^4) + (11*B^2*(b*c - a
*d)^4*n^2*Log[c + d*x])/(12*b*d^4) - (B^2*(b*c - a*d)^3*n*(a + b*x)*Log[(e*
(a + b*x)^n)/(c + d*x)^n])/(2*b*d^3) + (B^2*(b*c - a*d)^2*n*(a + b*x)^2*Log
[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*d^2) - (B^2*(b*c - a*d)*n*(a + b*x)^3*L
og[(e*(a + b*x)^n)/(c + d*x)^n])/(6*b*d) + (A*B*(a + b*x)^4*Log[(e*(a + b*x
)^n)/(c + d*x)^n])/(2*b) - (B^2*(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x
))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*d^4) + (B^2*(a + b*x)^4*Log[(e*(
a + b*x)^n)/(c + d*x)^n]^2)/(4*b) - (B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a
 + b*x))/(b*(c + d*x))])/(2*b*d^4)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
```

```
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^3 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 \, dx = \int \left(A^2(a+bx)^3 + 2AB(a+bx)^3\log\left(e(a+bx)^n(c+dx)\right.\right.$$

$$= \frac{A^2(a+bx)^4}{4b} + (2AB)\int (a+bx)^3\log\left(e(a+bx)^n(c+dx\right.$$

$$= \frac{A^2(a+bx)^4}{4b} + \frac{AB(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} +$$

$$= \frac{A^2(a+bx)^4}{4b} + \frac{AB(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} +$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} - AB(bc-$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} - AB(bc-$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} - AB(bc-$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} - \frac{5B^2(bc-ad)^3n^2x}{12d^3} + \frac{AB(bc-ad)^2n}{4bd^2}$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} - \frac{5B^2(bc-ad)^3n^2x}{12d^3} + \frac{AB(bc-ad)^2n}{4bd^2}$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} - \frac{5B^2(bc-ad)^3n^2x}{12d^3} + \frac{AB(bc-ad)^2n}{4bd^2}$$

Mathematica [B] time = 1.80, size = 1709, normalized size = 5.31

$$3A^2d^4x^4b^4 - 2ABcd^3nx^3b^4 + B^2c^2d^2n^2x^2b^4 + 3ABc^2d^2nx^2b^4 + 3B^2c^4n^2\log^2(c+dx)b^4 + 3B^2d^4x^4\log^2\left(e(a+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-24*a^4*A*B*d^4*n + 6*a*b^3*B^2*c^3*d*n^2 - 24*a^2*b^2*B^2*c^2*d^2*n^2 + 3
6*a^3*b*B^2*c*d^3*n^2 - 24*a^4*B^2*d^4*n^2 + 12*a^3*A^2*b*d^4*x - 6*A*b^4*B
*c^3*d*n*x + 24*a*A*b^3*B*c^2*d^2*n*x - 36*a^2*A*b^2*B*c*d^3*n*x + 18*a^3*A
*b*B*d^4*n*x - 5*b^4*B^2*c^3*d*n^2*x + 17*a*b^3*B^2*c^2*d^2*n^2*x - 19*a^2*
b^2*B^2*c*d^3*n^2*x + 7*a^3*b*B^2*d^4*n^2*x + 18*a^2*A^2*b^2*d^4*x^2 + 3*A*
b^4*B*c^2*d^2*n*x^2 - 12*a*A*b^3*B*c*d^3*n*x^2 + 9*a^2*A*b^2*B*d^4*n*x^2 +
b^4*B^2*c^2*d^2*n^2*x^2 - 2*a*b^3*B^2*c*d^3*n^2*x^2 + a^2*b^2*B^2*d^4*n^2*x
^2 + 12*a*A^2*b^3*d^4*x^3 - 2*A*b^4*B*c*d^3*n*x^3 + 2*a*A*b^3*B*d^4*n*x^3 +
 3*A^2*b^4*d^4*x^4 - 3*a^4*B^2*d^4*n^2*Log[a + b*x]^2 + 6*A*b^4*B*c^4*n*Log
[c + d*x] - 24*a*A*b^3*B*c^3*d*n*Log[c + d*x] + 36*a^2*A*b^2*B*c^2*d^2*n*Lo
g[c + d*x] - 24*a^3*A*b*B*c*d^3*n*Log[c + d*x] + 11*b^4*B^2*c^4*n^2*Log[c +
 d*x] - 38*a*b^3*B^2*c^3*d*n^2*Log[c + d*x] + 45*a^2*b^2*B^2*c^2*d^2*n^2*Lo
g[c + d*x] - 18*a^3*b*B^2*c*d^3*n^2*Log[c + d*x] - 24*a^4*B^2*d^4*n^2*Log[c
 + d*x] + 3*b^4*B^2*c^4*n^2*Log[c + d*x]^2 - 12*a*b^3*B^2*c^3*d*n^2*Log[c +
 d*x]^2 + 18*a^2*b^2*B^2*c^2*d^2*n^2*Log[c + d*x]^2 - 12*a^3*b*B^2*c*d^3*n^
2*Log[c + d*x]^2 - 24*a^4*B^2*d^4*n*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 24*a
```

```
^3*A*b*B*d^4*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 6*b^4*B^2*c^3*d*n*x*Log[(
e*(a + b*x)^n)/(c + d*x)^n] + 24*a*b^3*B^2*c^2*d^2*n*x*Log[(e*(a + b*x)^n)/
(c + d*x)^n] - 36*a^2*b^2*B^2*c*d^3*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] +
18*a^3*b*B^2*d^4*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 36*a^2*A*b^2*B*d^4*
x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 3*b^4*B^2*c^2*d^2*n*x^2*Log[(e*(a +
b*x)^n)/(c + d*x)^n] - 12*a*b^3*B^2*c*d^3*n*x^2*Log[(e*(a + b*x)^n)/(c + d*
x)^n] + 9*a^2*b^2*B^2*d^4*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 24*a*A*b
^3*B*d^4*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b^4*B^2*c*d^3*n*x^3*Log[(
e*(a + b*x)^n)/(c + d*x)^n] + 2*a*b^3*B^2*d^4*n*x^3*Log[(e*(a + b*x)^n)/(c
+ d*x)^n] + 6*A*b^4*B*d^4*x^4*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 6*b^4*B^2*
c^4*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 24*a*b^3*B^2*c^3*d*n*
Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 36*a^2*b^2*B^2*c^2*d^2*n*Lo
g[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 24*a^3*b*B^2*c*d^3*n*Log[c +
d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 12*a^3*b*B^2*d^4*x*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^2 + 18*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n
]^2 + 12*a*b^3*B^2*d^4*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 3*b^4*B^2*d
^4*x^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + B*n*Log[a + b*x]*(-6*b*B*c*(b^3
*c^3 - 4*a*b^2*c^2*d + 6*a^2*b*c*d^2 - 4*a^3*d^3)*n*Log[c + d*x] + 6*B*(b*c
 - a*d)^4*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(-6*b^3*B*c^3*n + 21*a*b^2
*B*c^2*d*n - 26*a^2*b*B*c*d^2*n + a^3*d^3*(6*A + 35*B*n) + 6*a^3*B*d^3*Log[
(e*(a + b*x)^n)/(c + d*x)^n])) + 6*B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)])/(12*b*d^4)
```

fricas [F] time = 1.04, size = 0, normalized size = 0.00

$$\text{integral}\left(A^{2} b^{3} x^{3} + 3 \, A^{2} a b^{2} x^{2} + 3 \, A^{2} a^{2} b x + A^{2} a^{3} + \left(B^{2} b^{3} x^{3} + 3 \, B^{2} a b^{2} x^{2} + 3 \, B^{2} a^{2} b x + B^{2} a^{3}\right) \log\left(\frac{\left(b x + a\right)^{n} e}{\left(d x + c\right)^{n}}\right)^{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b^3*x^3 + 3*A^2*a*b^2*x^2 + 3*A^2*a^2*b*x + A^2*a^3 + (B^2*b^3
*x^3 + 3*B^2*a*b^2*x^2 + 3*B^2*a^2*b*x + B^2*a^3)*log((b*x + a)^n*e/(d*x +
c)^n)^2 + 2*(A*B*b^3*x^3 + 3*A*B*a*b^2*x^2 + 3*A*B*a^2*b*x + A*B*a^3)*log((
b*x + a)^n*e/(d*x + c)^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx + a)^{3} \left(B \log\left(\frac{(bx + a)^{n} e}{(dx + c)^{n}}\right) + A\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^3*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

maple [C] time = 3.55, size = 26948, normalized size = 83.69

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

maxima [B] time = 7.07, size = 1871, normalized size = 5.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxi
ma")
```

```
[Out] 1/2*A*B*b^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A^2*b^3*x^4 + 2*A*B*a*
b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + A^2*a*b^2*x^3 + 3*A*B*a^2*b*x^2*lo
g((b*x + a)^n*e/(d*x + c)^n) + 3/2*A^2*a^2*b*x^2 + 2*A*B*a^3*x*log((b*x + a
)^n*e/(d*x + c)^n) + A^2*a^3*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*x +
c)/d)*A*B*a^3/e - 3*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 +
(b*c*e*n - a*d*e*n)*x/(b*d))*A*B*a^2*b/e + (2*a^3*e*n*log(b*x + a)/b^3 - 2*
c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*
n - a^2*d^2*e*n)*x)/(b^2*d^2))*A*B*a*b^2/e - 1/12*(6*a^4*e*n*log(b*x + a)/b
^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 -
3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b
^3*d^3))*A*B*b^3/e + 1/12*((11*n^2 + 6*n*log(e))*b^3*c^4 - 2*(19*n^2 + 12*n
*log(e))*a*b^2*c^3*d + 9*(5*n^2 + 4*n*log(e))*a^2*b*c^2*d^2 - 6*(3*n^2 + 4*
n*log(e))*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 1/2*(b^4*c^4*n^2 - 4*a*b^3*c^3*
d*n^2 + 6*a^2*b^2*c^2*d^2*n^2 - 4*a^3*b*c*d^3*n^2 + a^4*d^4*n^2)*(log(b*x +
 a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))
*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*x^4*log(e)^2 - 3*B^2*a^4*d^4*n^2*log(b*x
 + a)^2 - 2*(b^4*c*d^3*n*log(e) - (n*log(e) + 6*log(e)^2)*a*b^3*d^4)*B^2*x^
3 + ((n^2 + 3*n*log(e))*b^4*c^2*d^2 - 2*(n^2 + 6*n*log(e))*a*b^3*c*d^3 + (n
^2 + 9*n*log(e) + 18*log(e)^2)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^4*n^2 - 4*a*
b^3*c^3*d*n^2 + 6*a^2*b^2*c^2*d^2*n^2 - 4*a^3*b*c*d^3*n^2)*B^2*log(b*x + a)
*log(d*x + c) + 3*(b^4*c^4*n^2 - 4*a*b^3*c^3*d*n^2 + 6*a^2*b^2*c^2*d^2*n^2
- 4*a^3*b*c*d^3*n^2)*B^2*log(d*x + c)^2 - ((5*n^2 + 6*n*log(e))*b^4*c^3*d -
 (17*n^2 + 24*n*log(e))*a*b^3*c^2*d^2 + (19*n^2 + 36*n*log(e))*a^2*b^2*c*d^
3 - (7*n^2 + 18*n*log(e) + 12*log(e)^2)*a^3*b*d^4)*B^2*x - (6*a*b^3*c^3*d*n
^2 - 21*a^2*b^2*c^2*d^2*n^2 + 26*a^3*b*c*d^3*n^2 - (11*n^2 + 6*n*log(e))*a^
4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*
a^2*b^2*d^4*x^2 + 4*B^2*a^3*b*d^4*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*x^
4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 + 4*B^2*a^3*b*d^4*x)*log((d
*x + c)^n)^2 + (6*B^2*b^4*d^4*x^4*log(e) + 6*B^2*a^4*d^4*n*log(b*x + a) + 2
*(a*b^3*d^4*(n + 12*log(e)) - b^4*c*d^3*n)*B^2*x^3 + 3*(3*a^2*b^2*d^4*(n +
4*log(e)) + b^4*c^2*d^2*n - 4*a*b^3*c*d^3*n)*B^2*x^2 + 6*(a^3*b*d^4*(3*n +
4*log(e)) - b^4*c^3*d*n + 4*a*b^3*c^2*d^2*n - 6*a^2*b^2*c*d^3*n)*B^2*x + 6*
(b^4*c^4*n - 4*a*b^3*c^3*d*n + 6*a^2*b^2*c^2*d^2*n - 4*a^3*b*c*d^3*n)*B^2*l
og(d*x + c))*log((b*x + a)^n) - (6*B^2*b^4*d^4*x^4*log(e) + 6*B^2*a^4*d^4*n
*log(b*x + a) + 2*(a*b^3*d^4*(n + 12*log(e)) - b^4*c*d^3*n)*B^2*x^3 + 3*(3*
a^2*b^2*d^4*(n + 4*log(e)) + b^4*c^2*d^2*n - 4*a*b^3*c*d^3*n)*B^2*x^2 + 6*(
a^3*b*d^4*(3*n + 4*log(e)) - b^4*c^3*d*n + 4*a*b^3*c^2*d^2*n - 6*a^2*b^2*c*
d^3*n)*B^2*x + 6*(b^4*c^4*n - 4*a*b^3*c^3*d*n + 6*a^2*b^2*c^2*d^2*n - 4*a^3
*b*c*d^3*n)*B^2*log(d*x + c) + 6*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6
*B^2*a^2*b^2*d^4*x^2 + 4*B^2*a^3*b*d^4*x)*log((b*x + a)^n))*log((d*x + c)^n
))/(b*d^4)
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^2\,{\left(a+b\,x\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x)^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x)^3, x)
```

sympy [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.157 $\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 \, dx$

Optimal. Leaf size=263

$$\frac{Bn(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2A+3Bn\right)}{3bd^3}+\frac{Bn(a+bx)(bc-ad)^2\big(2B\log(e(a+b}{3bd^2}$$

```
[Out] -1/3*B*(-a*d+b*c)*n*(b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d+1/3*(b*
x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b+1/3*B*(-a*d+b*c)^2*n*(b*x+a)*(
2*A+B*n+2*B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^2+1/3*B*(-a*d+b*c)^3*n*ln((-a*
d+b*c)/b/(d*x+c))*(2*A+3*B*n+2*B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^3+2/3*B^2
*(-a*d+b*c)^3*n^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^3
```

Rubi [A] time = 0.63, antiderivative size = 427, normalized size of antiderivative = 1.62, number of steps used = 18, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$\frac{2B^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}+\frac{A^2(a+bx)^3}{3b}+\frac{2ABnx(bc-ad)^2}{3d^2}-\frac{2ABn(bc-ad)^3\log(c+dx)}{3bd^3}+2AB(a$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^2*n*x)/(3*d^2) + (B^2*(b*c - a*d)^2*n^2*x)/(3*d^2) - (A*
B*(b*c - a*d)*n*(a + b*x)^2)/(3*b*d) + (A^2*(a + b*x)^3)/(3*b) - (2*A*B*(b*
c - a*d)^3*n*Log[c + d*x])/(3*b*d^3) - (B^2*(b*c - a*d)^3*n^2*Log[c + d*x])
/(b*d^3) + (2*B^2*(b*c - a*d)^2*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n
])/(3*b*d^2) - (B^2*(b*c - a*d)*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(3*b*d) + (2*A*B*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b) +
 (2*B^2*(b*c - a*d)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/
(c + d*x)^n])/(3*b*d^3) + (B^2*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]
^2)/(3*b) + (2*B^2*(b*c - a*d)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(3*b*d^3)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2(a+bx)^2+2AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-}\right.\right.$$

$$= \frac{A^2(a+bx)^3}{3b} + (2AB)\int (a+bx)^2\log\left(e(a+bx)^n(c+dx\right.$$

$$= \frac{A^2(a+bx)^3}{3b} + \frac{2AB(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b}$$

$$= \frac{A^2(a+bx)^3}{3b} + \frac{2AB(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A^2(a+bx}{3b}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A^2(a+bx}{3b}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A^2(a+bx}{3b}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} + \frac{B^2(bc-ad)^2n^2x}{3d^2} - \frac{AB(bc-ad)n(a}{3bd}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} + \frac{B^2(bc-ad)^2n^2x}{3d^2} - \frac{AB(bc-ad)n(a}{3bd}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} + \frac{B^2(bc-ad)^2n^2x}{3d^2} - \frac{AB(bc-ad)n(a}{3bd}$$

Mathematica [B] time = 1.06, size = 1149, normalized size = 4.37

$$A^2d^3x^3b^3 - ABcd^2nx^2b^3 - B^2c^3n^2\log^2(c+dx)b^3 + B^2d^3x^3\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)b^3 + B^2c^2dn^2xb^3 + 2A$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-6*a^3*A*B*d^3*n - 2*a*b^2*B^2*c^2*d*n^2 + 6*a^2*b*B^2*c*d^2*n^2 - 6*a^3*B
^2*d^3*n^2 + 3*a^2*A^2*b*d^3*x + 2*A*b^3*B*c^2*d*n*x - 6*a*A*b^2*B*c*d^2*n*
x + 4*a^2*A*b*B*d^3*n*x + b^3*B^2*c^2*d*n^2*x - 2*a*b^2*B^2*c*d^2*n^2*x + a
^2*b*B^2*d^3*n^2*x + 3*a*A^2*b^2*d^3*x^2 - A*b^3*B*c*d^2*n*x^2 + a*A*b^2*B*
d^3*n*x^2 + A^2*b^3*d^3*x^3 - a^3*B^2*d^3*n^2*Log[a + b*x]^2 - 2*A*b^3*B*c^
3*n*Log[c + d*x] + 6*a*A*b^2*B*c^2*d*n*Log[c + d*x] - 6*a^2*A*b*B*c*d^2*n*L
og[c + d*x] - 3*b^3*B^2*c^3*n^2*Log[c + d*x] + 7*a*b^2*B^2*c^2*d*n^2*Log[c
+ d*x] - 4*a^2*b*B^2*c*d^2*n^2*Log[c + d*x] - 6*a^3*B^2*d^3*n^2*Log[c + d*x
] - b^3*B^2*c^3*n^2*Log[c + d*x]^2 + 3*a*b^2*B^2*c^2*d*n^2*Log[c + d*x]^2 -
 3*a^2*b*B^2*c*d^2*n^2*Log[c + d*x]^2 - 6*a^3*B^2*d^3*n*Log[(e*(a + b*x)^n)
/(c + d*x)^n] + 6*a^2*A*b*B*d^3*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*b^3*
B^2*c^2*d*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 6*a*b^2*B^2*c*d^2*n*x*Log[
(e*(a + b*x)^n)/(c + d*x)^n] + 4*a^2*b*B^2*d^3*n*x*Log[(e*(a + b*x)^n)/(c +
 d*x)^n] + 6*a*A*b^2*B*d^3*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] - b^3*B^2*c
*d^2*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + a*b^2*B^2*d^3*n*x^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + 2*A*b^3*B*d^3*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n
```

```
] - 2*b^3*B^2*c^3*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 6*a*b^2
*B^2*c^2*d*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 6*a^2*b*B^2*c*
d^2*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 3*a^2*b*B^2*d^3*x*Log
[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 3*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*x)^n)/(
c + d*x)^n]^2 + b^3*B^2*d^3*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + B*n*Lo
g[a + b*x]*(2*b*B*c*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*n*Log[c + d*x] - 2*B*
(b*c - a*d)^3*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(2*b^2*B*c^2*n - 5*a*b
*B*c*d*n + a^2*d^2*(2*A + 9*B*n) + 2*a^2*B*d^2*Log[(e*(a + b*x)^n)/(c + d*x
)^n])) - 2*B^2*(b*c - a*d)^3*n^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])/
(3*b*d^3)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2b^2x^2 + 2\,A^2abx + A^2a^2 + \left(B^2b^2x^2 + 2\,B^2abx + B^2a^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,\big(ABb^2x^2 + 2\,ABabx +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b^2*x^2 + 2*A^2*a*b*x + A^2*a^2 + (B^2*b^2*x^2 + 2*B^2*a*b*x +
 B^2*a^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*(A*B*b^2*x^2 + 2*A*B*a*b*x +
 A*B*a^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^2\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

maple [C] time = 2.84, size = 19969, normalized size = 75.93

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

maxima [B] time = 7.05, size = 1284, normalized size = 4.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxi
ma")
```

```
[Out] 2/3*A*B*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^2*b^2*x^3 + 2*A*B*a*
b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^2*a*b*x^2 + 2*A*B*a^2*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A^2*a^2*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*x
+ c)/d)*A*B*a^2/e - 2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2
+ (b*c*e*n - a*d*e*n)*x/(b*d))*A*B*a*b/e + 1/3*(2*a^3*e*n*log(b*x + a)/b^3
- 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^
```

```
2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A*B*b^2/e - 1/3*((3*n^2 + 2*n*log(e))*b^
2*c^3 - (7*n^2 + 6*n*log(e))*a*b*c^2*d + 2*(2*n^2 + 3*n*log(e))*a^2*c*d^2)*
B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2 + 3*a^2*b*c*d^2
*n^2 - a^3*d^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilo
g(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*x^3*log(e)^2
- B^2*a^3*d^3*n^2*log(b*x + a)^2 - (b^3*c*d^2*n*log(e) - (n*log(e) + 3*log(
e)^2)*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2 + 3*a^2*b*c*d
^2*n^2)*B^2*log(b*x + a)*log(d*x + c) - (b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2 +
3*a^2*b*c*d^2*n^2)*B^2*log(d*x + c)^2 + ((n^2 + 2*n*log(e))*b^3*c^2*d - 2*(
n^2 + 3*n*log(e))*a*b^2*c*d^2 + (n^2 + 4*n*log(e) + 3*log(e)^2)*a^2*b*d^3)*
B^2*x + (2*a*b^2*c^2*d*n^2 - 5*a^2*b*c*d^2*n^2 + (3*n^2 + 2*n*log(e))*a^3*d
^3)*B^2*log(b*x + a) + (B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b
*d^3*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2
*a^2*b*d^3*x)*log((d*x + c)^n)^2 + (2*B^2*b^3*d^3*x^3*log(e) + 2*B^2*a^3*d^
3*n*log(b*x + a) + (a*b^2*d^3*(n + 6*log(e)) - b^3*c*d^2*n)*B^2*x^2 + 2*(a^
2*b*d^3*(2*n + 3*log(e)) + b^3*c^2*d*n - 3*a*b^2*c*d^2*n)*B^2*x - 2*(b^3*c^
3*n - 3*a*b^2*c^2*d*n + 3*a^2*b*c*d^2*n)*B^2*log(d*x + c))*log((b*x + a)^n)
 - (2*B^2*b^3*d^3*x^3*log(e) + 2*B^2*a^3*d^3*n*log(b*x + a) + (a*b^2*d^3*(n
 + 6*log(e)) - b^3*c*d^2*n)*B^2*x^2 + 2*(a^2*b*d^3*(2*n + 3*log(e)) + b^3*c
^2*d*n - 3*a*b^2*c*d^2*n)*B^2*x - 2*(b^3*c^3*n - 3*a*b^2*c^2*d*n + 3*a^2*b*
c*d^2*n)*B^2*log(d*x + c) + 2*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^
2*a^2*b*d^3*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(A + B\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^2 (a+b\,x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x)^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x)^2, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.158 $\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx$

Optimal. Leaf size=195

$$-\frac{Bn(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A+Bn\right)}{bd^2}-\frac{Bn(a+bx)(bc-ad)\left(B\log\left(e(a+bx)^n(c+\right.\right.}{bd}$$

```
[Out] -B*(-a*d+b*c)*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d+1/2*(b*x+a)^2
*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b-B*(-a*d+b*c)^2*n*ln((-a*d+b*c)/b/(d*
x+c))*(A+B*n+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^2-B^2*(-a*d+b*c)^2*n^2*poly
log(2,d*(b*x+a)/b/(d*x+c))/b/d^2
```

Rubi [A] time = 0.49, antiderivative size = 308, normalized size of antiderivative = 1.58, number of steps used = 15, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{B^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}+\frac{A^2(a+bx)^2}{2b}+\frac{ABn(bc-ad)^2\log(c+dx)}{bd^2}+\frac{AB(a+bx)^2\log\left(e(a+bx)^n(c+\right.}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*n*x)/d) + (A^2*(a + b*x)^2)/(2*b) + (A*B*(b*c - a*d)^2*n
*Log[c + d*x])/(b*d^2) + (B^2*(b*c - a*d)^2*n^2*Log[c + d*x])/(b*d^2) - (B^
2*(b*c - a*d)*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (A*B*(a
 + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/b - (B^2*(b*c - a*d)^2*n*Log[(b
*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) + (B^2*(
a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b) - (B^2*(b*c - a*d)^2*n
^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
```

```
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2(a+bx)+2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+\right.$$

$$= \frac{A^2(a+bx)^2}{2b} + (2AB)\int (a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)$$

$$= \frac{A^2(a+bx)^2}{2b} + \frac{AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{B^2}{}$$

$$= \frac{A^2(a+bx)^2}{2b} + \frac{AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{B^2}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2 n\log(c+d}{bd^2}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2 n\log(c+d}{bd^2}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2 n\log(c+d}{bd^2}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2 n\log(c+d}{bd^2}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2 n\log(c+d}{bd^2}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2 n\log(c+d}{bd^2}$$

Mathematica [**B**] time = 0.73, size = 656, normalized size = 3.36

$$-\frac{2a^2ABn}{b} - \frac{2a^2B^2n\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} - \frac{2a^2B^2n^2\log(c+dx)}{b} - \frac{a^2B^2n^2\log^2(a+bx)}{2b} - \frac{2a^2B^2n^2}{b} + aA^2x + \frac{Bn}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-2*a^2*A*B*n)/b - (2*a^2*B^2*n^2)/b + (a*B^2*c*n^2)/d + a*A^2*x + a*A*B*n*
x - (A*b*B*c*n*x)/d + (A^2*b*x^2)/2 - (a^2*B^2*n^2*Log[a + b*x]^2)/(2*b) +
(A*b*B*c^2*n*Log[c + d*x])/d^2 - (2*a*A*B*c*n*Log[c + d*x])/d - (2*a^2*B^2*
n^2*Log[c + d*x])/b + (b*B^2*c^2*n^2*Log[c + d*x])/d^2 - (a*B^2*c*n^2*Log[c
 + d*x])/d + (b*B^2*c^2*n^2*Log[c + d*x]^2)/(2*d^2) - (a*B^2*c*n^2*Log[c +
d*x]^2)/d - (2*a^2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/b + 2*a*A*B*x*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n] + a*B^2*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 - (b*B^2*c*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n])/d + A*b*B*x^2*Log[(e*(a +
 b*x)^n)/(c + d*x)^n] + (b*B^2*c^2*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/d^2 - (2*a*B^2*c*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/
d + a*B^2*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + (b*B^2*x^2*Log[(e*(a + b*x
)^n)/(c + d*x)^n]^2)/2 + (B*n*Log[a + b*x]*(b*B*c*(-(b*c) + 2*a*d)*n*Log[c
+ d*x] + B*(b*c - a*d)^2*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(-(b*B*c*n)
 + a*d*(A + 3*B*n) + a*B*d*Log[(e*(a + b*x)^n)/(c + d*x)^n])))/(b*d^2) + (B
^2*(b*c - a*d)^2*n^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])/(b*d^2)
```

fricas [**F**] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2bx + A^2a + \left(B^2bx + B^2a\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,(ABbx + ABa)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b*x + A^2*a + (B^2*b*x + B^2*a)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*b*x + A*B*a)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

maple [**C**] time = 2.09, size = 10210, normalized size = 52.36

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

maxima [**B**] time = 6.91, size = 779, normalized size = 3.99

$$ABbx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{2}\,A^2bx^2+2\,ABax\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2ax+\frac{2\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)ABa}{e}-\frac{\left(\frac{a^2en\,\mathrm{l}}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxima
")
```

```
[Out] A*B*b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^2*b*x^2 + 2*A*B*a*x*log((b
*x + a)^n*e/(d*x + c)^n) + A^2*a*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A*B*a/e - (a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 +
(b*c*e*n - a*d*e*n)*x/(b*d))*A*B*b/e + ((n^2 + n*log(e))*b*c^2 - (n^2 + 2*n
*log(e))*a*c*d)*B^2*log(d*x + c)/d^2 + (b^2*c^2*n^2 - 2*a*b*c*d*n^2 + a^2*d
^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b*d^2) - 1/2*(B^2*a^2*d^2*n^2*log(b*x + a)^2 - B^2*
b^2*d^2*x^2*log(e)^2 + 2*(b^2*c^2*n^2 - 2*a*b*c*d*n^2)*B^2*log(b*x + a)*log
(d*x + c) - (b^2*c^2*n^2 - 2*a*b*c*d*n^2)*B^2*log(d*x + c)^2 + 2*(b^2*c*d*n
*log(e) - (n*log(e) + log(e)^2)*a*b*d^2)*B^2*x + 2*(a*b*c*d*n^2 - (n^2 + n*
log(e))*a^2*d^2)*B^2*log(b*x + a) - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x)*log
((b*x + a)^n)^2 - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x)*log((d*x + c)^n)^2 -
2*(B^2*b^2*d^2*x^2*log(e) + B^2*a^2*d^2*n*log(b*x + a) + (a*b*d^2*(n + 2*lo
g(e)) - b^2*c*d*n)*B^2*x + (b^2*c^2*n - 2*a*b*c*d*n)*B^2*log(d*x + c))*log(
(b*x + a)^n) + 2*(B^2*b^2*d^2*x^2*log(e) + B^2*a^2*d^2*n*log(b*x + a) + (a*
b*d^2*(n + 2*log(e)) - b^2*c*d*n)*B^2*x + (b^2*c^2*n - 2*a*b*c*d*n)*B^2*log
```

```
(d*x + c) + (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b*d^2)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \left(A + B \ln\left(\frac{e\,(a + b\,x)^n}{(c + d\,x)^n}\right)\right)^2 (a + b\,x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2*(a + b*x), x)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.159 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{a+bx}\,dx$

Optimal. Leaf size=131

$$\frac{2Bn\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{b}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{b}+2B$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*ln(1-b*(d*x+c)/d/(b*x+a))/b+2*B*n*(A+B
*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b+2*B^2*n^2*po
lylog(3,b*(d*x+c)/d/(b*x+a))/b
```

Rubi [A] time = 0.50, antiderivative size = 227, normalized size of antiderivative = 1.73, number of steps used = 10, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.242$, Rules used = {6742, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{2ABn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}+\frac{2B^2n\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{2B^2n^2\text{PolyLog}\left(3,\right.}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x),x]
```

```
[Out] (A^2*Log[a + b*x])/b - (2*A*B*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])/b - (B^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/b + (2*A*B*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a +
b*x))])/b + (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c -
 a*d)/(d*(a + b*x))])/b + (2*B^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x
))])/b
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
```

```
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{a+bx}\,dx &= \int \left(\frac{A^2}{a+bx}+\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}+\frac{B^2\log^2\left(e(a+bx)^n(\right.}{a+bx}\right.\\
&= \frac{A^2\log(a+bx)}{b}+(2AB)\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\,dx+B^2\int \frac{\mathrm{lo}}{}\\
&= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{B}{}\\
&= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{B}{}\\
&= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{B}{}\\
&= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{B}{}\\
&= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{B}{}
\end{aligned}$$

Mathematica [B] time = 0.19, size = 269, normalized size = 2.05

$$\frac{A^2\log(a+bx)-2AB\log\left(\frac{ad-bc}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2ABn\mathrm{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)-ABn\log^2\left(\frac{ad-bc}{d(a+bx)}\right)-2ABn}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x),x]
```

```
[Out] (-(A*B*n*Log[(-(b*c) + a*d)/(d*(a + b*x))]^2) + A^2*Log[a + b*x] - 2*A*B*n*
Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*A*B*Lo
g[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - B^2*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*A*B*n*
PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*B^2*n*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*n^2*PolyLog[3, (b*
(c + d*x))/(d*(a + b*x))])/b
```

fricas **[F]** time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^2}{bx+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(b*x + a), x)
```

giac **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a), x)
```

maple **[F]** time = 2.57, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\,(bx+a)^n\,(dx+c)^{-n}\right) + A\right)^2}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x)
```

maxima **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{B^2\log(bx+a)\log\left((dx+c)^n\right)^2}{b} + \frac{A^2\log(bx+a)}{b} - \int -\frac{B^2bc\log(e)^2 + 2\,ABbc\log(e) + \left(B^2bdx + B^2bc\right)\log\left((b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x, algorithm="maxima
")
```

```
[Out] B^2*log(b*x + a)*log((d*x + c)^n)^2/b + A^2*log(b*x + a)/b - integrate(-(B^
2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log((b*x + a)^n)^
2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 2*(B^2*b*c*log(e) + A*B*b*c +
```

```
 (B^2*b*d*log(e) + A*B*b*d)*x)*log((b*x + a)^n) - 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x + (B^2*b*d*n*x + B^2*a*d*n)*log(b*x + a)
+ (B^2*b*d*x + B^2*b*c)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d*x^2 + a*
b*c + (b^2*c + a*b*d)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(A + B\,\ln\left(\frac{e\,{(a+b\,x)}^n}{{(c+d\,x)}^n}\right)\right)^2}{a + b\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(a + b*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(a + b*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B\log\left(e\left(a + bx\right)^{n}\left(c + dx\right)^{-n}\right)\right)^{2}}{a + bx}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a),x)
```

```
[Out] Integral((A + B*log(e*(a + b*x)**n*(c + d*x)**(-n)))**2/(a + b*x), x)
```

3.160 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{(a+bx)^2}\,dx$

Optimal. Leaf size=129

$$-\frac{2Bn(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{(a+bx)(bc-ad)}-\frac{2B^2n^2(c+d}{(a+bx)(bc-}$$

```
[Out] -2*B^2*n^2*(d*x+c)/(-a*d+b*c)/(b*x+a)-2*B*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d
*x+c)^n)))/(-a*d+b*c)/(b*x+a)-(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(
-a*d+b*c)/(b*x+a)
```

Rubi [A] time = 0.18, antiderivative size = 189, normalized size of antiderivative = 1.47, number of steps used = 7, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {6742, 2490, 32}

$$-\frac{A^2}{b(a+bx)}-\frac{2AB(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{2ABn}{b(a+bx)}-\frac{B^2(c+dx)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-2B^2n$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^2,x]
```

```
[Out] -(A^2/(b*(a + b*x))) - (2*A*B*n)/(b*(a + b*x)) - (2*B^2*n^2)/(b*(a + b*x))
- (2*A*B*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*c - a*d)*(a + b*x)
) - (2*B^2*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*c - a*d)*(a +
b*x)) - (B^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)*(a
+ b*x))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)^2}dx = \int\left(\frac{A^2}{(a+bx)^2}+\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}+\frac{B^2\log^2\left(e(a+bx\right.}{(a+bx}\right.$$

$$= -\frac{A^2}{b(a+bx)}+(2AB)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}dx+B^2\int\frac{\log^2(e}{}$$

$$= -\frac{A^2}{b(a+bx)}-\frac{2AB(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)}-\frac{B^2(c+dx)\,\mathrm{l}}{(b}$$

$$= -\frac{A^2}{b(a+bx)}-\frac{2ABn}{b(a+bx)}-\frac{2AB(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)}-$$

$$= -\frac{A^2}{b(a+bx)}-\frac{2ABn}{b(a+bx)}-\frac{2B^2n^2}{b(a+bx)}-\frac{2AB(c+dx)\log\left(e(a+bx)^n(c\right.}{(bc-ad)(a+bx)}$$

Mathematica [A] time = 0.37, size = 236, normalized size = 1.83

$$\frac{-(bc-ad)\left(2B(A+Bn)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+B^2\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)+A^2+2ABn+2B^2n^2\right)-2B}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^2,x]
```

```
[Out] (B^2*d*n^2*(a + b*x)*Log[a + b*x]^2 + B^2*d*n^2*(a + b*x)*Log[c + d*x]^2 +
2*B*d*n*(a + b*x)*Log[c + d*x]*(A + B*n + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
]) - 2*B*d*n*(a + b*x)*Log[a + b*x]*(A + B*n + B*n*Log[c + d*x] + B*Log[(e*
(a + b*x)^n)/(c + d*x)^n]) - (b*c - a*d)*(A^2 + 2*A*B*n + 2*B^2*n^2 + 2*B*(
A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + B^2*Log[(e*(a + b*x)^n)/(c + d*
x)^n]^2))/(b*(b*c - a*d)*(a + b*x))
```

fricas [B] time = 0.84, size = 339, normalized size = 2.63

$$-\frac{A^2bc-A^2ad+2\left(B^2bc-B^2ad\right)n^2+\left(B^2bdn^2x+B^2bcn^2\right)\log\left(bx+a\right)^2+\left(B^2bdn^2x+B^2bcn^2\right)\log\left(dx+c\right)^2+\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x, algorithm="fric
as")
```

```
[Out] -(A^2*b*c - A^2*a*d + 2*(B^2*b*c - B^2*a*d)*n^2 + (B^2*b*d*n^2*x + B^2*b*c*
n^2)*log(b*x + a)^2 + (B^2*b*d*n^2*x + B^2*b*c*n^2)*log(d*x + c)^2 + (B^2*b
*c - B^2*a*d)*log(e)^2 + 2*(A*B*b*c - A*B*a*d)*n + 2*(B^2*b*c*n^2 + A*B*b*c
*n + (B^2*b*d*n^2 + A*B*b*d*n)*x + (B^2*b*d*n*x + B^2*b*c*n)*log(e))*log(b*
x + a) - 2*(B^2*b*c*n^2 + A*B*b*c*n + (B^2*b*d*n^2 + A*B*b*d*n)*x + (B^2*b*
d*n^2*x + B^2*b*c*n^2)*log(b*x + a) + (B^2*b*d*n*x + B^2*b*c*n)*log(e))*log
(d*x + c) + 2*(A*B*b*c - A*B*a*d + (B^2*b*c - B^2*a*d)*n)*log(e))/(a*b^2*c
- a^2*b*d + (b^3*c - a*b^2*d)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^2, x)
```

maple [C] time = 2.25, size = 10098, normalized size = 78.28

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x)
```

```
[Out] result too large to display
```

maxima [B] time = 1.53, size = 449, normalized size = 3.48

$$-B^2\left(\frac{2\left(\frac{den\log(bx+a)}{b^2c-abd}-\frac{den\log(dx+c)}{b^2c-abd}+\frac{en}{b^2x+ab}\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}{e}+\frac{2\,bce^2n^2-2\,ade^2n^2-\left(bde^2n^2x+ade^2n^2\right)\log(bx -}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x, algorithm="maxi
ma")
```

```
[Out] -B^2*(2*(d*e*n*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a
*b*d) + e*n/(b^2*x + a*b))*log((b*x + a)^n*e/(d*x + c)^n)/e + (2*b*c*e^2*n^
2 - 2*a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a)^2 - (b*d*e^2
*n^2*x + a*d*e^2*n^2)*log(d*x + c)^2 + 2*(b*d*e^2*n^2*x + a*d*e^2*n^2)*log(
b*x + a) - 2*(b*d*e^2*n^2*x + a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*l
og(b*x + a))*log(d*x + c))/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x)*e^2))
 - B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^2*x + a*b) - 2*(d*e*n*log(b*x +
a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) + e*n/(b^2*x + a*b)
)*A*B/e - 2*A*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^2*x + a*b) - A^2/(b^2*x +
 a*b)
```

mupad [B] time = 5.27, size = 200, normalized size = 1.55

$$-\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\left(\frac{2\,A\,B}{x\,b^2+a\,b}+\frac{2\,B^2\,n}{x\,b^2+a\,b}\right)-\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)^2\left(\frac{B^2}{b\,(a+b\,x)}-\frac{B^2\,d}{b\,(a\,d-b\,c)}\right)-\frac{A^2+2\,A\,B\,n+2}{x\,b^2+a\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(a + b*x)^2,x)
```

```
[Out] - log((e*(a + b*x)^n)/(c + d*x)^n)*((2*A*B)/(a*b + b^2*x) + (2*B^2*n)/(a*b
+ b^2*x)) - log((e*(a + b*x)^n)/(c + d*x)^n)^2*(B^2/(b*(a + b*x)) - (B^2*d)
/(b*(a*d - b*c))) - (A^2 + 2*B^2*n^2 + 2*A*B*n)/(a*b + b^2*x) - (B*d*n*atan
((((b^2*c + a*b*d)/b + 2*b*d*x)*1i)/(a*d - b*c))*(A + B*n)*4i)/(b*(a*d - b*
c))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**2,x)
```

```
[Out] Timed out
```

3.161 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{(a+bx)^3}\,dx$

Optimal. Leaf size=274

$$-\frac{bBn(c+dx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{2(a+bx)^2(bc-ad)^2}+\frac{2Bdn(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)^2}-\frac{b(c+dx)^2}{}$$

```
[Out] 2*B^2*d*n^2*(d*x+c)/(-a*d+b*c)^2/(b*x+a)-1/4*b*B^2*n^2*(d*x+c)^2/(-a*d+b*c)
^2/(b*x+a)^2+2*B*d*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^2
/(b*x+a)-1/2*b*B*n*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^2
/(b*x+a)^2+d*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^2/(b*x+
a)-1/2*b*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^2/(b*x+a)
^2
```

Rubi [A] time = 0.42, antiderivative size = 411, normalized size of antiderivative = 1.50, number of steps used = 12, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.242$, Rules used = {6742, 2492, 44, 2491, 2490, 32, 2509, 37}

$$-\frac{A^2}{2b(a+bx)^2}+\frac{ABd^2n\log(a+bx)}{b(bc-ad)^2}-\frac{ABd^2n\log(c+dx)}{b(bc-ad)^2}-\frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b(a+bx)^2}+\frac{ABdn}{b(a+bx)(bc-ad)}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^3,x]
```

```
[Out] -A^2/(2*b*(a + b*x)^2) - (A*B*n)/(2*b*(a + b*x)^2) + (A*B*d*n)/(b*(b*c - a*
d)*(a + b*x)) + (2*B^2*d*n^2)/(b*(b*c - a*d)*(a + b*x)) - (b*B^2*n^2*(c + d
*x)^2)/(4*(b*c - a*d)^2*(a + b*x)^2) + (A*B*d^2*n*Log[a + b*x])/(b*(b*c - a
*d)^2) - (A*B*d^2*n*Log[c + d*x])/(b*(b*c - a*d)^2) - (A*B*Log[(e*(a + b*x)
^n)/(c + d*x)^n])/(b*(a + b*x)^2) + (2*B^2*d*n*(c + d*x)*Log[(e*(a + b*x)^n
)/(c + d*x)^n])/((b*c - a*d)^2*(a + b*x)) - (b*B^2*n*(c + d*x)^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(2*(b*c - a*d)^2*(a + b*x)^2) + (B^2*d*(c + d*x)*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)^2*(a + b*x)) - (b*B^2*(c + d
*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*c - a*d)^2*(a + b*x)^2)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
```

```
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)^3}\,dx &= \int \left(\frac{A^2}{(a+bx)^3} + \frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3} + \frac{B^2\log^2\left(e(a+bx\right.}{(a+bx} \right. \\
&= -\frac{A^2}{2b(a+bx)^2} + (2AB)\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\,dx + B^2\int \frac{\log^2}{} \\
&= -\frac{A^2}{2b(a+bx)^2} - \frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b(a+bx)^2} + \frac{\left(bB^2\right)\int \frac{(c+dx)\log^2(e(}{(a}}{bc-} \\
&= -\frac{A^2}{2b(a+bx)^2} - \frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b(a+bx)^2} + \frac{B^2d(c+dx)\log^2(e}{(bc-ad} \\
&= -\frac{A^2}{2b(a+bx)^2} - \frac{ABn}{2b(a+bx)^2} + \frac{ABdn}{b(bc-ad)(a+bx)} + \frac{ABd^2n\log(a+}{b(bc-ad)^2} \\
&= -\frac{A^2}{2b(a+bx)^2} - \frac{ABn}{2b(a+bx)^2} + \frac{ABdn}{b(bc-ad)(a+bx)} + \frac{2B^2dn^2}{b(bc-ad)(a+b}
\end{aligned}$$

Mathematica [A] time = 0.52, size = 332, normalized size = 1.21

$$-\frac{(bc-ad)\left(2A^2(bc-ad) + 2B(2A(bc-ad) + Bn(-3ad+bc-2bdx))\log\left(e(a+bx)^n(c+dx)^{-n}\right) + 2ABn(-3ad+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^3,x]
```

```
[Out] -1/4*(2*B^2*d^2*n^2*(a + b*x)^2*Log[a + b*x]^2 + 2*B^2*d^2*n^2*(a + b*x)^2*
Log[c + d*x]^2 + 2*B*d^2*n*(a + b*x)^2*Log[c + d*x]*(2*A + 3*B*n + 2*B*Log[
(e*(a + b*x)^n)/(c + d*x)^n]) - 2*B*d^2*n*(a + b*x)^2*Log[a + b*x]*(2*A + 3
*B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + (b*c -
a*d)*(2*A^2*(b*c - a*d) + B^2*n^2*(b*c - 7*a*d - 6*b*d*x) + 2*A*B*n*(b*c -
3*a*d - 2*b*d*x) + 2*B*(2*A*(b*c - a*d) + B*n*(b*c - 3*a*d - 2*b*d*x))*Log[
(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*(b*c - a*d)*Log[(e*(a + b*x)^n)/(c + d
*x)^n]^2))/(b*(b*c - a*d)^2*(a + b*x)^2)
```

fricas [B] time = 0.77, size = 919, normalized size = 3.35

$$-\frac{2\,A^2b^2c^2 - 4\,A^2abcd + 2\,A^2a^2d^2 + \left(B^2b^2c^2 - 8\,B^2abcd + 7\,B^2a^2d^2\right)n^2 - 2\left(B^2b^2d^2n^2x^2 + 2\,B^2abd^2n^2x - \left(B^2b^2c^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x, algorithm="fric
as")
```

```
[Out] -1/4*(2*A^2*b^2*c^2 - 4*A^2*a*b*c*d + 2*A^2*a^2*d^2 + (B^2*b^2*c^2 - 8*B^2*
a*b*c*d + 7*B^2*a^2*d^2)*n^2 - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*a*b*d^2*n^2*x
 - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n^2)*log(b*x + a)^2 - 2*(B^2*b^2*d^2*n^2*x
^2 + 2*B^2*a*b*d^2*n^2*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n^2)*log(d*x + c)^
2 + 2*(B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2)*log(e)^2 + 2*(A*B*b^2*c^2
 - 4*A*B*a*b*c*d + 3*A*B*a^2*d^2)*n - 2*(3*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2
+ 2*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x + 2*((B^2*b^2*c^2 - 4*B^2*a*b*c*d)*n^2
 - (3*B^2*b^2*d^2*n^2 + 2*A*B*b^2*d^2*n)*x^2 + 2*(A*B*b^2*c^2 - 2*A*B*a*b*c
*d)*n - 2*(2*A*B*a*b*d^2*n + (B^2*b^2*c*d + 2*B^2*a*b*d^2)*n^2)*x - 2*(B^2*
b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n)*log(e)
)*log(b*x + a) - 2*((B^2*b^2*c^2 - 4*B^2*a*b*c*d)*n^2 - (3*B^2*b^2*d^2*n^2
```

```
+ 2*A*B*b^2*d^2*n)*x^2 + 2*(A*B*b^2*c^2 - 2*A*B*a*b*c*d)*n - 2*(2*A*B*a*b*d
^2*n + (B^2*b^2*c*d + 2*B^2*a*b*d^2)*n^2)*x - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^
2*a*b*d^2*n^2*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n^2)*log(b*x + a) - 2*(B^2*
b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n)*log(e)
)*log(d*x + c) + 2*(2*A*B*b^2*c^2 - 4*A*B*a*b*c*d + 2*A*B*a^2*d^2 - 2*(B^2*
b^2*c*d - B^2*a*b*d^2)*n*x + (B^2*b^2*c^2 - 4*B^2*a*b*c*d + 3*B^2*a^2*d^2)*
n)*log(e))/(a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*
d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{2}}{(bx+a)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^3, x)
```

maple [C] time = 3.36, size = 17300, normalized size = 63.14

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x)
```

```
[Out] result too large to display
```

maxima [B] time = 1.85, size = 899, normalized size = 3.28

$$\frac{1}{4}\,B^{2}\Bigg(\frac{2\left(\frac{2\,d^{2}en\log(bx+a)}{b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}}-\frac{2\,d^{2}en\log(dx+c)}{b^{3}c^{2}-2\,ab^{2}cd+a^{2}bd^{2}}+\frac{2\,bdenx-bcen+3\,aden}{a^{2}b^{2}c-a^{3}bd+\left(b^{4}c-ab^{3}d\right)x^{2}+2\left(ab^{3}c-a^{2}b^{2}d\right)x}\right)\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)}{e}-\frac{b^{2}c^{2}e^{2}n^{2}-8}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/4*B^2*(2*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*
d^2*e*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b
*c*e*n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3
*c - a^2*b^2*d)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e - (b^2*c^2*e^2*n^2 - 8
*a*b*c*d*e^2*n^2 + 7*a^2*d^2*e^2*n^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e
^2*n^2*x + a^2*d^2*e^2*n^2)*log(b*x + a)^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b
*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*log(d*x + c)^2 - 6*(b^2*c*d*e^2*n^2 - a*b
*d^2*e^2*n^2)*x - 6*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^
2*n^2)*log(b*x + a) + 2*(3*b^2*d^2*e^2*n^2*x^2 + 6*a*b*d^2*e^2*n^2*x + 3*a^
2*d^2*e^2*n^2 - 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*
n^2)*log(b*x + a))*log(d*x + c))/((a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2
+ (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d
+ a^3*b^2*d^2)*x)*e^2)) - 1/2*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^3*x^2
 + 2*a*b^2*x + a^2*b) + 1/2*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d
+ a^2*b*d^2) - 2*d^2*e*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) +
 (2*b*d*e*n*x - b*c*e*n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*
d)*x^2 + 2*(a*b^3*c - a^2*b^2*d)*x))*A*B/e - A*B*log((b*x + a)^n*e/(d*x + c
)^n)/(b^3*x^2 + 2*a*b^2*x + a^2*b) - 1/2*A^2/(b^3*x^2 + 2*a*b^2*x + a^2*b)
```

mupad [B] time = 5.32, size = 444, normalized size = 1.62

$$-\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)^2\left(\frac{B^2}{2\,b\,\left(a^2+2\,a\,b\,x+b^2\,x^2\right)}-\frac{B^2\,d^2}{2\,b\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{\frac{2\,A^2\,a\,d-2\,A^2\,b\,c+7\,B^2\,a\,d\,n^2-B^2\,b\,c\,n^2+6\,A}{2\,(a\,d-b\,c)}}{2\,a^2\,b+4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(a + b*x)^3,x)
```

```
[Out] - log((e*(a + b*x)^n)/(c + d*x)^n)^2*(B^2/(2*b*(a^2 + b^2*x^2 + 2*a*b*x)) -
 (B^2*d^2)/(2*b*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((2*A^2*a*d - 2*A^2*b*c
 + 7*B^2*a*d*n^2 - B^2*b*c*n^2 + 6*A*B*a*d*n - 2*A*B*b*c*n)/(2*(a*d - b*c))
 + (d*x*(3*B^2*b*n^2 + 2*A*B*b*n))/(a*d - b*c))/(2*a^2*b + 2*b^3*x^2 + 4*a*
b^2*x) - log((e*(a + b*x)^n)/(c + d*x)^n)*((A*B)/(a^2*b + b^3*x^2 + 2*a*b^2
*x) + (B^2*d^2*((b*n*(a*d - b*c)*(2*a*d - b*c))/(2*d^2) + (b^2*n*x*(a*d - b
*c))/d + (a*b*n*(a*d - b*c))/(2*d)))/(b*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(a^
2*b + b^3*x^2 + 2*a*b^2*x))) - (B*d^2*n*atan(((2*b*d*x - (2*b^3*c^2 - 2*a^2
*b*d^2)/(2*b*(a*d - b*c)))*1i)/(a*d - b*c))*(2*A + 3*B*n)*1i)/(b*(a*d - b*c
)^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**3,x)
```

```
[Out] Timed out
```

3.162 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{(a+bx)^4}\,dx$

Optimal. Leaf size=427

$$-\frac{b^2(c+dx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{3(a+bx)^3(bc-ad)^3}-\frac{2b^2Bn(c+dx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{9(a+bx)^3(bc-ad)^3}-\frac{d^2(c+}{}$$

```
[Out] -2*B^2*d^2*n^2*(d*x+c)/(-a*d+b*c)^3/(b*x+a)+1/2*b*B^2*d*n^2*(d*x+c)^2/(-a*d
+b*c)^3/(b*x+a)^2-2/27*b^2*B^2*n^2*(d*x+c)^3/(-a*d+b*c)^3/(b*x+a)^3-2*B*d^2
*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^3/(b*x+a)+b*B*d*n*(
d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^3/(b*x+a)^2-2/9*b^2*B
*n*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^3/(b*x+a)^3-d^2*(
d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^3/(b*x+a)+b*d*(d*x+c)
^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^3/(b*x+a)^2-1/3*b^2*(d*x+
c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^3/(b*x+a)^3
```

Rubi [C] time = 1.21, antiderivative size = 730, normalized size of antiderivative = 1.71, number of steps used = 26, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315}

$$-\frac{2B^2d^3n^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b(bc-ad)^3}-\frac{2B^2d^3n^2\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{3b(bc-ad)^3}-\frac{A^2}{3b(a+bx)^3}-\frac{2ABd^2n}{3b(a+bx)(bc-ad)^2}-\frac{2ABd^3}{3b(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^4,x]
```

```
[Out] -A^2/(3*b*(a + b*x)^3) - (2*A*B*n)/(9*b*(a + b*x)^3) - (2*B^2*n^2)/(27*b*(a
 + b*x)^3) + (A*B*d*n)/(3*b*(b*c - a*d)*(a + b*x)^2) + (5*B^2*d*n^2)/(18*b*
(b*c - a*d)*(a + b*x)^2) - (2*A*B*d^2*n)/(3*b*(b*c - a*d)^2*(a + b*x)) - (1
1*B^2*d^2*n^2)/(9*b*(b*c - a*d)^2*(a + b*x)) - (2*A*B*d^3*n*Log[a + b*x])/(
3*b*(b*c - a*d)^3) - (5*B^2*d^3*n^2*Log[a + b*x])/(9*b*(b*c - a*d)^3) + (2*
A*B*d^3*n*Log[c + d*x])/(3*b*(b*c - a*d)^3) + (5*B^2*d^3*n^2*Log[c + d*x])/
(9*b*(b*c - a*d)^3) - (2*A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(a + b*
x)^3) - (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(9*b*(a + b*x)^3) + (B^2
*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)*(a + b*x)^2) - (2*B
^2*d^2*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*(b*c - a*d)^3*(a +
b*x)) + (2*B^2*d^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/
(c + d*x)^n])/(3*b*(b*c - a*d)^3) - (2*B^2*d^3*n*Log[(b*c - a*d)/(b*(c + d*
x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)^3) - (B^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/(3*b*(a + b*x)^3) - (2*B^2*d^3*n^2*PolyLog[2, (d
*(a + b*x))/(b*(c + d*x))])/(3*b*(b*c - a*d)^3) - (2*B^2*d^3*n^2*PolyLog[2,
 1 + (b*c - a*d)/(d*(a + b*x))])/(3*b*(b*c - a*d)^3)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
```

```
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)^4}\,dx = \int\left(\frac{A^2}{(a+bx)^4}+\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}+\frac{B^2\log^2\left(e(a+\right.}{(a+}\right.$$

$$= -\frac{A^2}{3b(a+bx)^3}+(2AB)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\,dx+B^2\int$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3}-\frac{B^2\log^2\left(e(a+\right.}{3b(a}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3}-\frac{B^2\log^2\left(e(a+\right.}{3b(a}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2ABn}{9b(a+bx)^3}+\frac{ABdn}{3b(bc-ad)(a+bx)^2}-\frac{2AB}{3b(bc-ad}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2ABn}{9b(a+bx)^3}+\frac{ABdn}{3b(bc-ad)(a+bx)^2}-\frac{2AB}{3b(bc-ad}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2ABn}{9b(a+bx)^3}+\frac{ABdn}{3b(bc-ad)(a+bx)^2}-\frac{2AB}{3b(bc-ad}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2ABn}{9b(a+bx)^3}-\frac{2B^2n^2}{27b(a+bx)^3}+\frac{ABdn}{3b(bc-ad)(a+bx}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2ABn}{9b(a+bx)^3}-\frac{2B^2n^2}{27b(a+bx)^3}+\frac{ABdn}{3b(bc-ad)(a+bx}$$

$$= -\frac{A^2}{3b(a+bx)^3}-\frac{2ABn}{9b(a+bx)^3}-\frac{2B^2n^2}{27b(a+bx)^3}+\frac{ABdn}{3b(bc-ad)(a+bx}$$

Mathematica [A] time = 0.73, size = 432, normalized size = 1.01

$$\frac{-(bc-ad)\left(6B\left(Bn\left(11a^2d^2+abd(15dx-7c)+b^2\left(2c^2-3cdx+6d^2x^2\right)\right)+6A(bc-ad)^2\right)\log\left(e(a+bx)^n(c+\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^4,x]
```

```
[Out] (18*B^2*d^3*n^2*(a + b*x)^3*Log[a + b*x]^2 + 18*B^2*d^3*n^2*(a + b*x)^3*Log
[c + d*x]^2 + 6*B*d^3*n*(a + b*x)^3*Log[c + d*x]*(6*A + 11*B*n + 6*B*Log[(e
*(a + b*x)^n)/(c + d*x)^n]) - 6*B*d^3*n*(a + b*x)^3*Log[a + b*x]*(6*A + 11*
B*n + 6*B*n*Log[c + d*x] + 6*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) - (b*c - a
*d)*(18*A^2*(b*c - a*d)^2 + 6*A*B*n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b
```

```
^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)) + B^2*n^2*(85*a^2*d^2 + a*b*d*(-23*c + 14
7*d*x) + b^2*(4*c^2 - 15*c*d*x + 66*d^2*x^2)) + 6*B*(6*A*(b*c - a*d)^2 + B*
n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)))
*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B^2*(b*c - a*d)^2*Log[(e*(a + b*x)^n
)/(c + d*x)^n]^2))/(54*b*(b*c - a*d)^3*(a + b*x)^3)
```

fricas [B] time = 1.16, size = 1635, normalized size = 3.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x, algorithm="fric
as")
```

```
[Out] -1/54*(18*A^2*b^3*c^3 - 54*A^2*a*b^2*c^2*d + 54*A^2*a^2*b*c*d^2 - 18*A^2*a^
3*d^3 + (4*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2 - 85*B^2*
a^3*d^3)*n^2 + 6*(11*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6*(A*B*b^3*c*d^2
 - A*B*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*x^
2 + 3*B^2*a^2*b*d^3*n^2*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*
c*d^2)*n^2)*log(b*x + a)^2 + 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*
x^2 + 3*B^2*a^2*b*d^3*n^2*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*
b*c*d^2)*n^2)*log(d*x + c)^2 + 18*(B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*
a^2*b*c*d^2 - B^2*a^3*d^3)*log(e)^2 + 6*(2*A*B*b^3*c^3 - 9*A*B*a*b^2*c^2*d
+ 18*A*B*a^2*b*c*d^2 - 11*A*B*a^3*d^3)*n - 3*((5*B^2*b^3*c^2*d - 54*B^2*a*b
^2*c*d^2 + 49*B^2*a^2*b*d^3)*n^2 + 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2*c*d^2 + 5
*A*B*a^2*b*d^3)*n)*x + 6*((11*B^2*b^3*d^3*n^2 + 6*A*B*b^3*d^3*n)*x^3 + (2*B
^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B*a*b^2*d
^3*n + (2*B^2*b^3*c*d^2 + 9*B^2*a*b^2*d^3)*n^2)*x^2 + 6*(A*B*b^3*c^3 - 3*A*
B*a*b^2*c^2*d + 3*A*B*a^2*b*c*d^2)*n + 3*(6*A*B*a^2*b*d^3*n - (B^2*b^3*c^2*
d - 6*B^2*a*b^2*c*d^2 - 6*B^2*a^2*b*d^3)*n^2)*x + 6*(B^2*b^3*d^3*n*x^3 + 3*
B^2*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*
d + 3*B^2*a^2*b*c*d^2)*n)*log(e))*log(b*x + a) - 6*((11*B^2*b^3*d^3*n^2 + 6
*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d
^2)*n^2 + 3*(6*A*B*a*b^2*d^3*n + (2*B^2*b^3*c*d^2 + 9*B^2*a*b^2*d^3)*n^2)*x
^2 + 6*(A*B*b^3*c^3 - 3*A*B*a*b^2*c^2*d + 3*A*B*a^2*b*c*d^2)*n + 3*(6*A*B*a
^2*b*d^3*n - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 6*B^2*a^2*b*d^3)*n^2)*x +
 6*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*x^2 + 3*B^2*a^2*b*d^3*n^2*x +
 (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*n^2)*log(b*x + a) +
6*(B^2*b^3*d^3*n*x^3 + 3*B^2*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + (B^2*b
^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*n)*log(e))*log(d*x + c) + 6
*(6*A*B*b^3*c^3 - 18*A*B*a*b^2*c^2*d + 18*A*B*a^2*b*c*d^2 - 6*A*B*a^3*d^3 +
 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n*x^2 - 3*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c
*d^2 + 5*B^2*a^2*b*d^3)*n*x + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a
^2*b*c*d^2 - 11*B^2*a^3*d^3)*n)*log(e))/(a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*
a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3
*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^
3)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B \log\left(\frac{(bx+a)^{n} e}{(dx+c)^{n}}\right) + A\right)^{2}}{(bx+a)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^4, x)
```

maple [C] time = 4.70, size = 25057, normalized size = 58.68

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x)
```

```
[Out] result too large to display
```

maxima [B] time = 2.43, size = 1500, normalized size = 3.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x, algorithm="maxi
ma")
```

```
[Out] -1/54*B^2*(6*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c
*d^2 - a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*
n + 11*a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^
4*b^2*c*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^
5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e + (4*b^3*c^3*e^2*n^2 - 2
7*a*b^2*c^2*d*e^2*n^2 + 108*a^2*b*c*d^2*e^2*n^2 - 85*a^3*d^3*e^2*n^2 + 66*(
b^3*c*d^2*e^2*n^2 - a*b^2*d^3*e^2*n^2)*x^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*
b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a)
^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^
2*x + a^3*d^3*e^2*n^2)*log(d*x + c)^2 - 3*(5*b^3*c^2*d*e^2*n^2 - 54*a*b^2*c
*d^2*e^2*n^2 + 49*a^2*b*d^3*e^2*n^2)*x + 66*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*
d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a) - 6
*(11*b^3*d^3*e^2*n^2*x^3 + 33*a*b^2*d^3*e^2*n^2*x^2 + 33*a^2*b*d^3*e^2*n^2*
x + 11*a^3*d^3*e^2*n^2 - 6*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 +
 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a))*log(d*x + c))/((a^3
*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b
^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^
2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d
 + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*x)*e^2)) - 1/3*B^2*log((b*x + a)^n*e/(d*x
 + c)^n)^2/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*b) - 1/9*(6*d^3*e*n*l
og(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) - 6*d^3
*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) +
 (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*n + 11*a^2*d^2*e*n - 3*(b
^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2 + (
b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a
^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*x))*A*B/e -
 2/3*A*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*
x + a^3*b) - 1/3*A^2/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*b)
```

mupad [B] time = 6.84, size = 911, normalized size = 2.13

$$\frac{\frac{18\,A^2\,a^2\,d^2-36\,A^2\,a\,b\,c\,d+18\,A^2\,b^2\,c^2+66\,A\,B\,a^2\,d^2\,n-42\,A\,B\,a\,b\,c\,d\,n+12\,A\,B\,b^2\,c^2\,n+85\,B^2\,a^2\,d^2\,n^2-23\,B^2\,a\,b\,c\,d\,n^2+4\,B^2\,b^2\,c^2\,n^2}{6\,(a\,d-b\,c)}+\frac{x\,(-5\,c\,B^2\,b^2}{}}{x^3\,\left(9\,b^5\,c-9\,a\,b^4\,d\right)+x\,\left(27\,a^2\,b^3\,c-27\,a^3\,b^2\,d\right)-x^2\,(27\,a^2\,b^3\,d-27}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(a + b*x)^4,x)
```

```
[Out] ((18*A^2*a^2*d^2 + 18*A^2*b^2*c^2 + 85*B^2*a^2*d^2*n^2 + 4*B^2*b^2*c^2*n^2
- 36*A^2*a*b*c*d + 66*A*B*a^2*d^2*n + 12*A*B*b^2*c^2*n - 23*B^2*a*b*c*d*n^2
 - 42*A*B*a*b*c*d*n)/(6*(a*d - b*c)) + (x*(49*B^2*a*b*d^2*n^2 - 5*B^2*b^2*c
*d*n^2 + 30*A*B*a*b*d^2*n - 6*A*B*b^2*c*d*n))/(2*(a*d - b*c)) + (d*x^2*(11*
B^2*b^2*d*n^2 + 6*A*B*b^2*d*n))/(a*d - b*c))/(x^3*(9*b^5*c - 9*a*b^4*d) + x
*(27*a^2*b^3*c - 27*a^3*b^2*d) - x^2*(27*a^2*b^3*d - 27*a*b^4*c) + 9*a^3*b^
2*c - 9*a^4*b*d) - log((e*(a + b*x)^n)/(c + d*x)^n)^2*(B^2/(3*b*(a^3 + b^3*
x^3 + 3*a*b^2*x^2 + 3*a^2*b*x)) - (B^2*d^3)/(3*b*(a^3*d^3 - b^3*c^3 + 3*a*b
^2*c^2*d - 3*a^2*b*c*d^2))) - log((e*(a + b*x)^n)/(c + d*x)^n)*((2*A*B)/(3*
(a^3*b + b^4*x^3 + 3*a^2*b^2*x + 3*a*b^3*x^2)) + (2*B^2*d^3*(a*((b*n*(a*d -
 b*c)*(3*a*d - b*c))/(2*d^2) + (a*b*n*(a*d - b*c))/d) + x*(b*((b*n*(a*d - b
*c)*(3*a*d - b*c))/(2*d^2) + (a*b*n*(a*d - b*c))/d) + (2*a*b^2*n*(a*d - b*c
))/d + (b^2*n*(a*d - b*c)*(3*a*d - b*c))/d^2) + (b*n*(a*d - b*c)*(3*a^2*d^2
 + b^2*c^2 - 3*a*b*c*d))/d^3 + (3*b^3*n*x^2*(a*d - b*c))/d))/(9*b*(a^3*d^3
- b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)*(a^3*b + b^4*x^3 + 3*a^2*b^2*x +
 3*a*b^3*x^2))) - (B*d^3*n*atan((B*d^3*n*(6*A + 11*B*n)*((b^4*c^3 + a^3*b*d
^3 - a^2*b^2*c*d^2 - a*b^3*c^2*d)/(b^3*c^2 + a^2*b*d^2 - 2*a*b^2*c*d) + 2*b
*d*x)*(b^3*c^2 + a^2*b*d^2 - 2*a*b^2*c*d)*1i)/(b*(11*B^2*d^3*n^2 + 6*A*B*d^
3*n)*(a*d - b*c)^3))*(6*A + 11*B*n)*2i)/(9*b*(a*d - b*c)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**4,x)
```

```
[Out] Timed out
```

3.163 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{(a+bx)^5}\,dx$

Optimal. Leaf size=587

$$-\frac{b^3(c+dx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{4(a+bx)^4(bc-ad)^4}-\frac{b^3Bn(c+dx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{8(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+}{}$$

```
[Out] 2*B^2*d^3*n^2*(d*x+c)/(-a*d+b*c)^4/(b*x+a)-3/4*b*B^2*d^2*n^2*(d*x+c)^2/(-a*
d+b*c)^4/(b*x+a)^2+2/9*b^2*B^2*d*n^2*(d*x+c)^3/(-a*d+b*c)^4/(b*x+a)^3-1/32*
b^3*B^2*n^2*(d*x+c)^4/(-a*d+b*c)^4/(b*x+a)^4+2*B*d^3*n*(d*x+c)*(A+B*ln(e*(b
*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)-3/2*b*B*d^2*n*(d*x+c)^2*(A+B*ln(
e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)^2+2/3*b^2*B*d*n*(d*x+c)^3*(A
+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)^3-1/8*b^3*B*n*(d*x+c)^
4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)^4+d^3*(d*x+c)*(A+B
*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^4/(b*x+a)-3/2*b*d^2*(d*x+c)^2*(A
+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^4/(b*x+a)^2+b^2*d*(d*x+c)^3*(A
+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^4/(b*x+a)^3-1/4*b^3*(d*x+c)^4*
(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^4/(b*x+a)^4
```

Rubi [C] time = 1.41, antiderivative size = 843, normalized size of antiderivative = 1.44, number of steps used = 29, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315}

$$\frac{13B^2n^2\log(a+bx)d^4}{24b(bc-ad)^4}+\frac{ABn\log(a+bx)d^4}{2b(bc-ad)^4}-\frac{13B^2n^2\log(c+dx)d^4}{24b(bc-ad)^4}-\frac{ABn\log(c+dx)d^4}{2b(bc-ad)^4}-\frac{B^2n\log\left(-\frac{bc-ad}{d(a+bx)}\right)\mathrm{lo}}{2b(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^5,x]
```

```
[Out] -A^2/(4*b*(a + b*x)^4) - (A*B*n)/(8*b*(a + b*x)^4) - (B^2*n^2)/(32*b*(a + b
*x)^4) + (A*B*d*n)/(6*b*(b*c - a*d)*(a + b*x)^3) + (7*B^2*d*n^2)/(72*b*(b*c
 - a*d)*(a + b*x)^3) - (A*B*d^2*n)/(4*b*(b*c - a*d)^2*(a + b*x)^2) - (13*B^
2*d^2*n^2)/(48*b*(b*c - a*d)^2*(a + b*x)^2) + (A*B*d^3*n)/(2*b*(b*c - a*d)^
3*(a + b*x)) + (25*B^2*d^3*n^2)/(24*b*(b*c - a*d)^3*(a + b*x)) + (A*B*d^4*n
*Log[a + b*x])/(2*b*(b*c - a*d)^4) + (13*B^2*d^4*n^2*Log[a + b*x])/(24*b*(b
*c - a*d)^4) - (A*B*d^4*n*Log[c + d*x])/(2*b*(b*c - a*d)^4) - (13*B^2*d^4*n
^2*Log[c + d*x])/(24*b*(b*c - a*d)^4) - (A*B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/(2*b*(a + b*x)^4) - (B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(a +
b*x)^4) + (B^2*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(6*b*(b*c - a*d)*(a +
b*x)^3) - (B^2*d^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*(b*c - a*d)^2*(
a + b*x)^2) + (B^2*d^3*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*(b*
c - a*d)^4*(a + b*x)) - (B^2*d^4*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e
*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) + (B^2*d^4*n*Log[(b*c - a*d
)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) - (B
^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(a + b*x)^4) + (B^2*d^4*n^2*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b*(b*c - a*d)^4) + (B^2*d^4*n^2*Po
lyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))]])/(2*b*(b*c - a*d)^4)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(a+bx)^5}\,dx=\int\left(\frac{A^2}{(a+bx)^5}+\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}+\frac{B^2\log^2(e(a+}{(a+}\right.$$

$$=-\frac{A^2}{4b(a+bx)^4}+(2AB)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\,dx+B^2\int$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^4}-\frac{B^2\log^2(e(a+b}{4b(a+}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^4}-\frac{B^2\log^2(e(a+b}{4b(a+}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}-\frac{AB}{4b(bc-ad}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}-\frac{AB}{4b(bc-ad}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}-\frac{AB}{4b(bc-ad}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}-\frac{B^2n^2}{32b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}-\frac{B^2n^2}{32b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx}$$

$$=-\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}-\frac{B^2n^2}{32b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx}$$

Mathematica [A] time = 0.95, size = 1011, normalized size = 1.72

$$-\frac{9\left(8A^2+4BnA+16B\left(-n\log(a+bx)+n\log(c+dx)+\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)A+B^2n^2+8B^2\left(-n\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^5,x]
```

```
[Out] -1/288*(72*b*B^2*n^2*(-4*a^3*d^3*(c + d*x) + 6*a^2*b*d^2*(c^2 - d^2*x^2) -
4*a*b^2*d*(c^3 + d^3*x^3) + b^3*(c^4 - d^4*x^4))*Log[a + b*x]^2 + 72*b*B^2*
```

```
n^2*(-4*a^3*d^3*(c + d*x) + 6*a^2*b*d^2*(c^2 - d^2*x^2) - 4*a*b^2*d*(c^3 +
d^3*x^3) + b^3*(c^4 - d^4*x^4))*Log[c + d*x]^2 - 4*B*d*(b*c - a*d)^3*n*(a +
 b*x)*(12*A + 7*B*n + 12*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a
+ b*x)^n)/(c + d*x)^n])) + 6*B*d^2*(b*c - a*d)^2*n*(a + b*x)^2*(12*A + 13*B
*n + 12*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*
x)^n])) - 12*B*d^3*(b*c - a*d)*n*(a + b*x)^3*(12*A + 25*B*n + 12*B*(-(n*Log
[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n])) - 12*B*d^4
*n*(a + b*x)^4*Log[a + b*x]*(12*A + 25*B*n + 12*B*(-(n*Log[a + b*x]) + n*Lo
g[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n])) + 12*B*d^4*n*(a + b*x)^4*Lo
g[c + d*x]*(12*A + 25*B*n + 12*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[
(e*(a + b*x)^n)/(c + d*x)^n])) + 9*(b*c - a*d)^4*(8*A^2 + 4*A*B*n + B^2*n^2
 + 16*A*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*
x)^n]) + 4*B^2*n*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/
(c + d*x)^n]) + 8*B^2*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x
)^n)/(c + d*x)^n])^2) - 12*B*(b*c - a*d)*n*Log[a + b*x]*(4*B*d*(b*c - a*d)^
2*n*(a + b*x) + 6*B*d^2*(-(b*c) + a*d)*n*(a + b*x)^2 + 12*B*d^3*n*(a + b*x)
^3 - 3*(b*c - a*d)^3*(4*A + B*n + 4*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] +
 Log[(e*(a + b*x)^n)/(c + d*x)^n]))) + 12*B*n*Log[c + d*x]*(4*B*d*(b*c - a*
d)^3*n*(a + b*x) - 6*B*d^2*(b*c - a*d)^2*n*(a + b*x)^2 + 12*B*d^3*(b*c - a*
d)*n*(a + b*x)^3 - 12*B*(b*c - a*d)^4*n*Log[a + b*x] + 12*B*d^4*n*(a + b*x)
^4*Log[a + b*x] - 3*(b*c - a*d)^4*(4*A + B*n + 4*B*(-(n*Log[a + b*x]) + n*L
og[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n]))))/(b*(b*c - a*d)^4*(a + b*
x)^4)
```

fricas [B] time = 0.84, size = 2458, normalized size = 4.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x, algorithm="fric
as")
```

```
[Out] -1/288*(72*A^2*b^4*c^4 - 288*A^2*a*b^3*c^3*d + 432*A^2*a^2*b^2*c^2*d^2 - 28
8*A^2*a^3*b*c*d^3 + 72*A^2*a^4*d^4 - 12*(25*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)
*n^2 + 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 + (9*B^2*b^4*c^4 - 64*B^2*
a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 576*B^2*a^3*b*c*d^3 + 415*B^2*a^4*d
^4)*n^2 + 6*((13*B^2*b^4*c^2*d^2 - 176*B^2*a*b^3*c*d^3 + 163*B^2*a^2*b^2*d^
4)*n^2 + 12*(A*B*b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*n)*x^
2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n
^2*x^2 + 4*B^2*a^3*b*d^4*n^2*x - (B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a
^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n^2)*log(b*x + a)^2 - 72*(B^2*b^4*d^4*n
^2*x^4 + 4*B^2*a*b^3*d^4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n^2*x^2 + 4*B^2*a^3*b*
d^4*n^2*x - (B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^
2*a^3*b*c*d^3)*n^2)*log(d*x + c)^2 + 72*(B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d +
6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3 + B^2*a^4*d^4)*log(e)^2 + 12*(3*A
*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 36*A*B*a^2*b^2*c^2*d^2 - 48*A*B*a^3*b*c*d
^3 + 25*A*B*a^4*d^4)*n - 4*((7*B^2*b^4*c^3*d - 60*B^2*a*b^3*c^2*d^2 + 324*B
^2*a^2*b^2*c*d^3 - 271*B^2*a^3*b*d^4)*n^2 + 12*(A*B*b^4*c^3*d - 6*A*B*a*b^3
*c^2*d^2 + 18*A*B*a^2*b^2*c*d^3 - 13*A*B*a^3*b*d^4)*n)*x - 12*((25*B^2*b^4*
d^4*n^2 + 12*A*B*b^4*d^4*n)*x^4 + 4*(12*A*B*a*b^3*d^4*n + (3*B^2*b^4*c*d^3
+ 22*B^2*a*b^3*d^4)*n^2)*x^3 - (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2
*a^2*b^2*c^2*d^2 - 48*B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B*a^2*b^2*d^4*n - (B^2
*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 18*B^2*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B*b
^4*c^4 - 4*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^2*d^2 - 4*A*B*a^3*b*c*d^3)*n +
 4*(12*A*B*a^3*b*d^4*n + (B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*
b^2*c*d^3 + 12*B^2*a^3*b*d^4)*n^2)*x + 12*(B^2*b^4*d^4*n*x^4 + 4*B^2*a*b^3*
d^4*n*x^3 + 6*B^2*a^2*b^2*d^4*n*x^2 + 4*B^2*a^3*b*d^4*n*x - (B^2*b^4*c^4 -
4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n)*log(e))*l
og(b*x + a) + 12*((25*B^2*b^4*d^4*n^2 + 12*A*B*b^4*d^4*n)*x^4 + 4*(12*A*B*a
*b^3*d^4*n + (3*B^2*b^4*c*d^3 + 22*B^2*a*b^3*d^4)*n^2)*x^3 - (3*B^2*b^4*c^4
```

```
 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c^2*d^2 - 48*B^2*a^3*b*c*d^3)*n^2 +
6*(12*A*B*a^2*b^2*d^4*n - (B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 18*B^2*a^2
*b^2*d^4)*n^2)*x^2 - 12*(A*B*b^4*c^4 - 4*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^
2*d^2 - 4*A*B*a^3*b*c*d^3)*n + 4*(12*A*B*a^3*b*d^4*n + (B^2*b^4*c^3*d - 6*B
^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 + 12*B^2*a^3*b*d^4)*n^2)*x + 12*(B^
2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n^2*x^2 + 4
*B^2*a^3*b*d^4*n^2*x - (B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2
*d^2 - 4*B^2*a^3*b*c*d^3)*n^2)*log(b*x + a) + 12*(B^2*b^4*d^4*n*x^4 + 4*B^2
*a*b^3*d^4*n*x^3 + 6*B^2*a^2*b^2*d^4*n*x^2 + 4*B^2*a^3*b*d^4*n*x - (B^2*b^4
*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n)*lo
g(e))*log(d*x + c) + 12*(12*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 72*A*B*a^2*b
^2*c^2*d^2 - 48*A*B*a^3*b*c*d^3 + 12*A*B*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*
a*b^3*d^4)*n*x^3 + 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d
^4)*n*x^2 - 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 -
 13*B^2*a^3*b*d^4)*n*x + (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b
^2*c^2*d^2 - 48*B^2*a^3*b*c*d^3 + 25*B^2*a^4*d^4)*n)*log(e))/(a^4*b^5*c^4 -
 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c
^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4
 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a
^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*
a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5
*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(bx+a)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^5, x)
```

maple [C] time = 5.84, size = 33370, normalized size = 56.85

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x)
```

```
[Out] result too large to display
```

maxima [B] time = 3.00, size = 2238, normalized size = 3.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/288*B^2*(12*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3
*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4
- 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^
3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 2
5*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n
- 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d +
 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 -
```

```
 a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*
b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3
*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e - (9*b^4*c^4*e^2*n^2 - 64*a*b^3*c^3
*d*e^2*n^2 + 216*a^2*b^2*c^2*d^2*e^2*n^2 - 576*a^3*b*c*d^3*e^2*n^2 + 415*a^
4*d^4*e^2*n^2 - 300*(b^4*c*d^3*e^2*n^2 - a*b^3*d^4*e^2*n^2)*x^3 + 6*(13*b^4
*c^2*d^2*e^2*n^2 - 176*a*b^3*c*d^3*e^2*n^2 + 163*a^2*b^2*d^4*e^2*n^2)*x^2 +
 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*
x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a)^2 + 72*(b^4*d^4
*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*
b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(d*x + c)^2 - 4*(7*b^4*c^3*d*e^2*n^2
- 60*a*b^3*c^2*d^2*e^2*n^2 + 324*a^2*b^2*c*d^3*e^2*n^2 - 271*a^3*b*d^4*e^2*
n^2)*x - 300*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4
*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a) + 12*(
25*b^4*d^4*e^2*n^2*x^4 + 100*a*b^3*d^4*e^2*n^2*x^3 + 150*a^2*b^2*d^4*e^2*n^
2*x^2 + 100*a^3*b*d^4*e^2*n^2*x + 25*a^4*d^4*e^2*n^2 - 12*(b^4*d^4*e^2*n^2*
x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2
*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a))*log(d*x + c))/((a^4*b^5*c^4 - 4*a^5
*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4
*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(
a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4
*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^
4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c
^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)*e^2)) - 1/4*B^2*log((b*x + a)^n*
e/(d*x + c)^n)^2/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4
*b) + 1/24*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^
2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4
*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d
^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a
^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5
*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*
a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^
3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4
*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^
3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*
x))*A*B/e - 1/2*A*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^5*x^4 + 4*a*b^4*x^3 +
 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) - 1/4*A^2/(b^5*x^4 + 4*a*b^4*x^3 + 6*
a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b)
```

mupad [B] time = 9.61, size = 1579, normalized size = 2.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(a + b*x)^5,x)
```

```
[Out] (B*d^4*n*atan((B*d^4*n*(12*A + 25*B*n)*((b^5*c^4 - a^4*b*d^4 + 2*a^3*b^2*c*
d^3 - 2*a*b^4*c^3*d)/(b^4*c^3 - a^3*b*d^3 + 3*a^2*b^2*c*d^2 - 3*a*b^3*c^2*d
) + 2*b*d*x)*(b^4*c^3 - a^3*b*d^3 + 3*a^2*b^2*c*d^2 - 3*a*b^3*c^2*d)*1i)/(b
*(25*B^2*d^4*n^2 + 12*A*B*d^4*n)*(a*d - b*c)^4))*(12*A + 25*B*n)*1i)/(12*b*
(a*d - b*c)^4) - log((e*(a + b*x)^n)/(c + d*x)^n)^2*(B^2/(4*b*(a^4 + b^4*x^
4 + 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x)) - (B^2*d^4)/(4*b*(a^4*d^4 + b
^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - ((72*A^2*a^
3*d^3 - 72*A^2*b^3*c^3 + 415*B^2*a^3*d^3*n^2 - 9*B^2*b^3*c^3*n^2 + 216*A^2*
a*b^2*c^2*d - 216*A^2*a^2*b*c*d^2 + 300*A*B*a^3*d^3*n - 36*A*B*b^3*c^3*n +
55*B^2*a*b^2*c^2*d*n^2 - 161*B^2*a^2*b*c*d^2*n^2 + 156*A*B*a*b^2*c^2*d*n -
276*A*B*a^2*b*c*d^2*n)/(12*(a*d - b*c)) + (x^2*(163*B^2*a*b^2*d^3*n^2 - 13*
B^2*b^3*c*d^2*n^2 + 84*A*B*a*b^2*d^3*n - 12*A*B*b^3*c*d^2*n))/(2*(a*d - b*c
)) + (x*(271*B^2*a^2*b*d^3*n^2 + 7*B^2*b^3*c^2*d*n^2 - 53*B^2*a*b^2*c*d^2*n
^2 + 156*A*B*a^2*b*d^3*n + 12*A*B*b^3*c^2*d*n - 60*A*B*a*b^2*c*d^2*n))/(3*(
```

```
a*d - b*c)) + (d*x^3*(25*B^2*b^3*d^2*n^2 + 12*A*B*b^3*d^2*n))/(a*d - b*c))/
(x*(96*a^3*b^4*c^2 + 96*a^5*b^2*d^2 - 192*a^4*b^3*c*d) + x^3*(96*a*b^6*c^2
+ 96*a^3*b^4*d^2 - 192*a^2*b^5*c*d) + x^4*(24*b^7*c^2 + 24*a^2*b^5*d^2 - 48
*a*b^6*c*d) + x^2*(144*a^2*b^5*c^2 + 144*a^4*b^3*d^2 - 288*a^3*b^4*c*d) + 2
4*a^6*b*d^2 + 24*a^4*b^3*c^2 - 48*a^5*b^2*c*d) - log((e*(a + b*x)^n)/(c + d
*x)^n)*((A*B)/(2*(a^4*b + b^5*x^4 + 4*a^3*b^2*x + 4*a*b^4*x^3 + 6*a^2*b^3*x
^2)) + (B^2*d^4*(x^2*(b*(b*((b*n*(a*d - b*c)*(4*a*d - b*c))/(6*d^2) + (a*b*
n*(a*d - b*c))/(2*d)) + (a*b^2*n*(a*d - b*c))/d + (b^2*n*(a*d - b*c)*(4*a*d
 - b*c))/(3*d^2)) + (3*a*b^3*n*(a*d - b*c))/(2*d) + (b^3*n*(a*d - b*c)*(4*a
*d - b*c))/(2*d^2)) + a*(a*((b*n*(a*d - b*c)*(4*a*d - b*c))/(6*d^2) + (a*b*
n*(a*d - b*c))/(2*d)) + (b*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))
/(6*d^3)) + x*(b*(a*((b*n*(a*d - b*c)*(4*a*d - b*c))/(6*d^2) + (a*b*n*(a*d
- b*c))/(2*d)) + (b*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(6*d^3
)) + a*(b*((b*n*(a*d - b*c)*(4*a*d - b*c))/(6*d^2) + (a*b*n*(a*d - b*c))/(2
*d)) + (a*b^2*n*(a*d - b*c))/d + (b^2*n*(a*d - b*c)*(4*a*d - b*c))/(3*d^2))
 + (b^2*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(2*d^3)) + (b*n*(a
*d - b*c)*(4*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/(2*d^4) +
(2*b^4*n*x^3*(a*d - b*c))/d))/(4*b*(a^4*b + b^5*x^4 + 4*a^3*b^2*x + 4*a*b^4
*x^3 + 6*a^2*b^3*x^2)*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*
d - 4*a^3*b*c*d^3)))
```

sympy [**F(-1)**]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**5,x)
```

```
[Out] Timed out
```

3.164 $\int (a+bx)^3 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx$

Optimal. Leaf size=809

$$-\frac{3Bn\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2(bc-ad)^4}{4bd^4}-\frac{B^3n^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{4bd^4}+\frac{3B^3n^3\log(c+dx)}{2bd^4}$$

```
[Out] -1/4*B^3*(-a*d+b*c)^3*n^3*x/d^3-1/4*B^3*(-a*d+b*c)^4*n^3*ln((b*x+a)/(d*x+c)
)/b/d^4+3/2*B^3*(-a*d+b*c)^4*n^3*ln(d*x+c)/b/d^4-7/4*B^2*(-a*d+b*c)^3*n^2*(
b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^3+1/4*b*B^2*(-a*d+b*c)^2*n^2*(
d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/d^4-9/2*B^2*(-a*d+b*c)^4*n^2*ln(
(-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^4-9/4*B*(-a*d+b
*c)^3*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b/d^3+9/8*b*B*(-a*d+b*c
)^2*n*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/d^4-1/4*b^2*B*(-a*d+b*c
)*n*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/d^4-3/4*B*(-a*d+b*c)^4*n*
ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b/d^4+1/4*(b*x
+a)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/b+7/4*B^2*(-a*d+b*c)^4*n^2*(A+B*l
n(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-b*(d*x+c)/d/(b*x+a))/b/d^4-9/2*B^3*(-a*d+b
*c)^4*n^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^4-3/2*B^2*(-a*d+b*c)^4*n^2*(A+
B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^4-7/4*B^3
*(-a*d+b*c)^4*n^3*polylog(2,b*(d*x+c)/d/(b*x+a))/b/d^4+3/2*B^3*(-a*d+b*c)^4
*n^3*polylog(3,d*(b*x+a)/b/(d*x+c))/b/d^4
```

Rubi [A] time = 2.40, antiderivative size = 1203, normalized size of antiderivative = 1.49, number of steps used = 56, number of rules used = 13, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.394$, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$-\frac{3B^3n\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)(bc-ad)^4}{4bd^4}+\frac{3B^3n^3\log(c+dx)(bc-ad)^4}{2bd^4}+\frac{11AB^2n^2\log(c+dx)(b}{4bd^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (-3*A^2*B*(b*c - a*d)^3*n*x)/(4*d^3) - (5*A*B^2*(b*c - a*d)^3*n^2*x)/(4*d^3
) - (B^3*(b*c - a*d)^3*n^3*x)/(4*d^3) + (3*A^2*B*(b*c - a*d)^2*n*(a + b*x)^
2)/(8*b*d^2) + (A*B^2*(b*c - a*d)^2*n^2*(a + b*x)^2)/(4*b*d^2) - (A^2*B*(b*
c - a*d)*n*(a + b*x)^3)/(4*b*d) + (A^3*(a + b*x)^4)/(4*b) + (3*A^2*B*(b*c -
 a*d)^4*n*Log[c + d*x])/(4*b*d^4) + (11*A*B^2*(b*c - a*d)^4*n^2*Log[c + d*x
])/(4*b*d^4) + (3*B^3*(b*c - a*d)^4*n^3*Log[c + d*x])/(2*b*d^4) - (3*A*B^2*
(b*c - a*d)^3*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*d^3) - (5*
B^3*(b*c - a*d)^3*n^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*d^3)
 + (3*A*B^2*(b*c - a*d)^2*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(
4*b*d^2) + (B^3*(b*c - a*d)^2*n^2*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(4*b*d^2) - (A*B^2*(b*c - a*d)*n*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/(2*b*d) + (3*A^2*B*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(
4*b) - (3*A*B^2*(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a +
b*x)^n)/(c + d*x)^n])/(2*b*d^4) - (11*B^3*(b*c - a*d)^4*n^2*Log[(b*c - a*d)
/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*d^4) - (3*B^3*(b*c -
 a*d)^3*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*d^3) + (3*B^3*
(b*c - a*d)^2*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(8*b*d^2) -
 (B^3*(b*c - a*d)*n*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*d)
 + (3*A*B^2*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b) - (3*B^3*
(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x
)^n]^2)/(4*b*d^4) + (B^3*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(4
*b) - (3*A*B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(
2*b*d^4) - (11*B^3*(b*c - a*d)^4*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
```

```
])/(4*b*d^4) - (3*B^3*(b*c - a*d)^4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Po
lyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*d^4) + (3*B^3*(b*c - a*d)^4*n
^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*d^4)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^3 \Big(A+B\log\big(e(a+bx)^n(c+dx)^{-n}\big)\Big)^3\,dx = \int \Big(A^3(a+bx)^3+3A^2B(a+bx)^3\log\big(e(a+bx)^n(c+dx)$$

$$= \frac{A^3(a+bx)^4}{4b} + \left(3A^2B\right)\int (a+bx)^3\log\big(e(a+bx)^n(c+d$$

$$= \frac{A^3(a+bx)^4}{4b} + \frac{3A^2B(a+bx)^4\log\big(e(a+bx)^n(c+dx)^{-n}\big)}{4b}$$

$$= \frac{A^3(a+bx)^4}{4b} + \frac{3A^2B(a+bx)^4\log\big(e(a+bx)^n(c+dx)^{-n}\big)}{4b}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+bx)^2}{8bd^2} - \frac{A^2}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+bx)^2}{8bd^2} - \frac{A^2}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+bx)^2}{8bd^2} - \frac{A^2}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} + \frac{3A^2B(bc-}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} + \frac{3A^2B(bc-}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} + \frac{3A^2B(bc-}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} - \frac{B^3(bc-ad}{4d^3}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} - \frac{B^3(bc-ad}{4d^3}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} - \frac{B^3(bc-ad}{4d^3}$$

Mathematica [B] time = 10.01, size = 9054, normalized size = 11.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] Result too large to show
```

fricas [F] time = 0.85, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^3b^3x^3 + 3\,A^3ab^2x^2 + 3\,A^3a^2bx + A^3a^3 + \left(B^3b^3x^3 + 3\,B^3ab^2x^2 + 3\,B^3a^2bx + B^3a^3\right)\log\bigg(\frac{(bx+a)^n e}{(dx+c)^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fric
as")
```

```
[Out] integral(A^3*b^3*x^3 + 3*A^3*a*b^2*x^2 + 3*A^3*a^2*b*x + A^3*a^3 + (B^3*b^3
*x^3 + 3*B^3*a*b^2*x^2 + 3*B^3*a^2*b*x + B^3*a^3)*log((b*x + a)^n*e/(d*x +
c)^n)^3 + 3*(A*B^2*b^3*x^3 + 3*A*B^2*a*b^2*x^2 + 3*A*B^2*a^2*b*x + A*B^2*a^
3)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*b^3*x^3 + 3*A^2*B*a*b^2*x^2
+ 3*A^2*B*a^2*b*x + A^2*B*a^3)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac
")
```

```
[Out] Timed out
```

maple **[F]** time = 8.02, size = 0, normalized size = 0.00

$$\int (bx+a)^3 \left(B\ln\left(e(bx+a)^n (dx+c)^{-n}\right)+A\right)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

maxima **[F]** time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxi
ma")
```

```
[Out] 3/4*A^2*B*b^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A^3*b^3*x^4 + 3*A^2*
B*a*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + A^3*a*b^2*x^3 + 9/2*A^2*B*a^2*
b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 3/2*A^3*a^2*b*x^2 + 3*A^2*B*a^3*x*lo
g((b*x + a)^n*e/(d*x + c)^n) + A^3*a^3*x + 3*(a*e*n*log(b*x + a)/b - c*e*n*
log(d*x + c)/d)*A^2*B*a^3/e - 9/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d
*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*a^2*b/e + 3/2*(2*a^3*e*n*l
og(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)
*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A^2*B*a*b^2/e - 1/8*(6*a
^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*(b^3*c*d^2*e*n -
a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n
 - a^3*d^3*e*n)*x)/(b^3*d^3))*A^2*B*b^3/e - 1/8*(2*(B^3*b^4*d^4*x^4 + 4*B^3
*a*b^3*d^4*x^3 + 6*B^3*a^2*b^2*d^4*x^2 + 4*B^3*a^3*b*d^4*x)*log((d*x + c)^n
)^3 - (6*B^3*a^4*d^4*n*log(b*x + a) + 6*(B^3*b^4*d^4*log(e) + A*B^2*b^4*d^4
)*x^4 + 6*(b^4*c^4*n - 4*a*b^3*c^3*d*n + 6*a^2*b^2*c^2*d^2*n - 4*a^3*b*c*d^
3*n)*B^3*log(d*x + c) + 2*(12*A*B^2*a*b^3*d^4 + (a*b^3*d^4*(n + 12*log(e))
- b^4*c*d^3*n)*B^3)*x^3 + 3*(12*A*B^2*a^2*b^2*d^4 + (3*a^2*b^2*d^4*(n + 4*l
og(e)) + b^4*c^2*d^2*n - 4*a*b^3*c*d^3*n)*B^3)*x^2 + 6*(4*A*B^2*a^3*b*d^4 +
 (a^3*b*d^4*(3*n + 4*log(e)) - b^4*c^3*d*n + 4*a*b^3*c^2*d^2*n - 6*a^2*b^2*
c*d^3*n)*B^3)*x + 6*(B^3*b^4*d^4*x^4 + 4*B^3*a*b^3*d^4*x^3 + 6*B^3*a^2*b^2*
d^4*x^2 + 4*B^3*a^3*b*d^4*x)*log((b*x + a)^n))*log((d*x + c)^n)^2)/(b*d^4)
- integrate(-1/4*(4*B^3*a^3*b*c*d^3*log(e)^3 + 12*A*B^2*a^3*b*c*d^3*log(e)^
```

```
2 + 4*(B^3*b^4*d^4*log(e)^3 + 3*A*B^2*b^4*d^4*log(e)^2)*x^4 + 4*(3*(b^4*c*d
^3*log(e)^2 + 3*a*b^3*d^4*log(e)^2)*A*B^2 + (b^4*c*d^3*log(e)^3 + 3*a*b^3*d
^4*log(e)^3)*B^3)*x^3 + 4*(B^3*b^4*d^4*x^4 + B^3*a^3*b*c*d^3 + (b^4*c*d^3 +
 3*a*b^3*d^4)*B^3*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*B^3*x^2 + (3*a^2*b^2*
c*d^3 + a^3*b*d^4)*B^3*x)*log((b*x + a)^n)^3 + 12*(3*(a*b^3*c*d^3*log(e)^2
+ a^2*b^2*d^4*log(e)^2)*A*B^2 + (a*b^3*c*d^3*log(e)^3 + a^2*b^2*d^4*log(e)^
3)*B^3)*x^2 + 12*(B^3*a^3*b*c*d^3*log(e) + A*B^2*a^3*b*c*d^3 + (B^3*b^4*d^4
*log(e) + A*B^2*b^4*d^4)*x^4 + ((b^4*c*d^3 + 3*a*b^3*d^4)*A*B^2 + (b^4*c*d^
3*log(e) + 3*a*b^3*d^4*log(e))*B^3)*x^3 + 3*((a*b^3*c*d^3 + a^2*b^2*d^4)*A*
B^2 + (a*b^3*c*d^3*log(e) + a^2*b^2*d^4*log(e))*B^3)*x^2 + ((3*a^2*b^2*c*d^
3 + a^3*b*d^4)*A*B^2 + (3*a^2*b^2*c*d^3*log(e) + a^3*b*d^4*log(e))*B^3)*x)*
log((b*x + a)^n)^2 + 4*(3*(3*a^2*b^2*c*d^3*log(e)^2 + a^3*b*d^4*log(e)^2)*A
*B^2 + (3*a^2*b^2*c*d^3*log(e)^3 + a^3*b*d^4*log(e)^3)*B^3)*x + 12*(B^3*a^3
*b*c*d^3*log(e)^2 + 2*A*B^2*a^3*b*c*d^3*log(e) + (B^3*b^4*d^4*log(e)^2 + 2*
A*B^2*b^4*d^4*log(e))*x^4 + (2*(b^4*c*d^3*log(e) + 3*a*b^3*d^4*log(e))*A*B^
2 + (b^4*c*d^3*log(e)^2 + 3*a*b^3*d^4*log(e)^2)*B^3)*x^3 + 3*(2*(a*b^3*c*d^
3*log(e) + a^2*b^2*d^4*log(e))*A*B^2 + (a*b^3*c*d^3*log(e)^2 + a^2*b^2*d^4*
log(e)^2)*B^3)*x^2 + (2*(3*a^2*b^2*c*d^3*log(e) + a^3*b*d^4*log(e))*A*B^2 +
 (3*a^2*b^2*c*d^3*log(e)^2 + a^3*b*d^4*log(e)^2)*B^3)*x)*log((b*x + a)^n) -
 (6*B^3*a^4*d^4*n^2*log(b*x + a) + 12*B^3*a^3*b*c*d^3*log(e)^2 + 24*A*B^2*a
^3*b*c*d^3*log(e) + 6*((n*log(e) + 2*log(e)^2)*B^3*b^4*d^4 + A*B^2*b^4*d^4*
(n + 4*log(e)))*x^4 + 6*(b^4*c^4*n^2 - 4*a*b^3*c^3*d*n^2 + 6*a^2*b^2*c^2*d^
2*n^2 - 4*a^3*b*c*d^3*n^2)*B^3*log(d*x + c) + 2*(12*(a*b^3*d^4*(n + 3*log(e
)) + b^4*c*d^3*log(e))*A*B^2 - ((n^2 - 6*log(e)^2)*b^4*c*d^3 - (n^2 + 12*n*
log(e) + 18*log(e)^2)*a*b^3*d^4)*B^3)*x^3 + 3*(12*(a^2*b^2*d^4*(n + 2*log(e
)) + 2*a*b^3*c*d^3*log(e))*A*B^2 + (b^4*c^2*d^2*n^2 - 4*(n^2 - 3*log(e)^2)*
a*b^3*c*d^3 + 3*(n^2 + 4*n*log(e) + 4*log(e)^2)*a^2*b^2*d^4)*B^3)*x^2 + 12*
(B^3*b^4*d^4*x^4 + B^3*a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*B^3*x^3 + 3*
(a*b^3*c*d^3 + a^2*b^2*d^4)*B^3*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*B^3*x)*
log((b*x + a)^n)^2 + 6*(4*(a^3*b*d^4*(n + log(e)) + 3*a^2*b^2*c*d^3*log(e))
*A*B^2 - (b^4*c^3*d*n^2 - 4*a*b^3*c^2*d^2*n^2 + 6*(n^2 - log(e)^2)*a^2*b^2*
c*d^3 - (3*n^2 + 4*n*log(e) + 2*log(e)^2)*a^3*b*d^4)*B^3)*x + 6*(4*B^3*a^3*
b*c*d^3*log(e) + 4*A*B^2*a^3*b*c*d^3 + (B^3*b^4*d^4*(n + 4*log(e)) + 4*A*B^
2*b^4*d^4)*x^4 + 4*((b^4*c*d^3 + 3*a*b^3*d^4)*A*B^2 + (a*b^3*d^4*(n + 3*log
(e)) + b^4*c*d^3*log(e))*B^3)*x^3 + 6*(2*(a*b^3*c*d^3 + a^2*b^2*d^4)*A*B^2
+ (a^2*b^2*d^4*(n + 2*log(e)) + 2*a*b^3*c*d^3*log(e))*B^3)*x^2 + 4*((3*a^2*
b^2*c*d^3 + a^3*b*d^4)*A*B^2 + (a^3*b*d^4*(n + log(e)) + 3*a^2*b^2*c*d^3*lo
g(e))*B^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^4*x + b*c*d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(A + B\,\ln\left(\frac{e\,{(a + b\,x)}^n}{{(c + d\,x)}^n}\right)\right)^3\,{(a + b\,x)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x)^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x)^3, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.165 $\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx$

Optimal. Leaf size=614

$$\frac{2B^2n^2(bc-ad)^3\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bd^3}+\frac{4B^2n^2(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n\right.\right.}{bd^3}$$

```
[Out] -B^3*(-a*d+b*c)^3*n^3*ln(d*x+c)/b/d^3+B^2*(-a*d+b*c)^2*n^2*(b*x+a)*(A+B*ln(
e*(b*x+a)^n/((d*x+c)^n)))/b/d^2+4*B^2*(-a*d+b*c)^3*n^2*ln((-a*d+b*c)/b/(d*x
+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b/d^3+2*B*(-a*d+b*c)^2*n*(b*x+a)*(A+
B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b/d^2-1/2*b*B*(-a*d+b*c)*n*(d*x+c)^2*(A+B*
ln(e*(b*x+a)^n/((d*x+c)^n)))^2/d^3+B*(-a*d+b*c)^3*n*ln((-a*d+b*c)/b/(d*x+c)
)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b/d^3+1/3*(b*x+a)^3*(A+B*ln(e*(b*x+a)
^n/((d*x+c)^n)))^3/b-B^2*(-a*d+b*c)^3*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))
*ln(1-b*(d*x+c)/d/(b*x+a))/b/d^3+4*B^3*(-a*d+b*c)^3*n^3*polylog(2,d*(b*x+a)
/b/(d*x+c))/b/d^3+2*B^2*(-a*d+b*c)^3*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*
polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^3+B^3*(-a*d+b*c)^3*n^3*polylog(2,b*(d*x+
c)/d/(b*x+a))/b/d^3-2*B^3*(-a*d+b*c)^3*n^3*polylog(3,d*(b*x+a)/b/(d*x+c))/b
/d^3
```

Rubi [A] time = 1.74, antiderivative size = 915, normalized size of antiderivative = 1.49, number of steps used = 40, number of rules used = 13, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.394, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{(a+bx)^3\log^3\left(e(a+bx)^n(c+dx)^{-n}\right)B^3}{3b}-\frac{(bc-ad)n(a+bx)^2\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)B^3}{2bd}+\frac{(bc-ad)^2n(a+bx)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (A^2*B*(b*c - a*d)^2*n*x)/d^2 + (A*B^2*(b*c - a*d)^2*n^2*x)/d^2 - (A^2*B*(b
*c - a*d)*n*(a + b*x)^2)/(2*b*d) + (A^3*(a + b*x)^3)/(3*b) - (A^2*B*(b*c -
a*d)^3*n*Log[c + d*x])/(b*d^3) - (3*A*B^2*(b*c - a*d)^3*n^2*Log[c + d*x])/(
b*d^3) - (B^3*(b*c - a*d)^3*n^3*Log[c + d*x])/(b*d^3) + (2*A*B^2*(b*c - a*d
)^2*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) + (B^3*(b*c - a*d
)^2*n^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) - (A*B^2*(b*c -
 a*d)*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (A^2*B*(a + b
*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/b + (2*A*B^2*(b*c - a*d)^3*n*Log[(b
*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^3) + (3*B^3
*(b*c - a*d)^3*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/(b*d^3) + (B^3*(b*c - a*d)^2*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2)/(b*d^2) - (B^3*(b*c - a*d)*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2)/(2*b*d) + (A*B^2*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
2)/b + (B^3*(b*c - a*d)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^2)/(b*d^3) + (B^3*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x
)^n]^3)/(3*b) + (2*A*B^2*(b*c - a*d)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c +
 d*x))])/(b*d^3) + (3*B^3*(b*c - a*d)^3*n^3*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))])/(b*d^3) + (2*B^3*(b*c - a*d)^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^
n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d^3) - (2*B^3*(b*c - a*d)^
3*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d^3)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx = \int \Big(A^3(a+bx)^2+3A^2B(a+bx)^2\log(e(a+bx)^n(c+dx$$

$$= \frac{A^3(a+bx)^3}{3b} + \left(3A^2B\right)\int (a+bx)^2\log(e(a+bx)^n(c+d$$

$$= \frac{A^3(a+bx)^3}{3b} + \frac{A^2B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

$$= \frac{A^3(a+bx)^3}{3b} + \frac{A^2B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \frac{A^3(a+b}{3b}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \frac{A^3(a+b}{3b}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \frac{A^3(a+b}{3b}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n}{2bd}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n}{2bd}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n}{2bd}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n}{2bd}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n}{2bd}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n}{2bd}$$

Mathematica [B] time = 4.22, size = 5668, normalized size = 9.23

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] Result too large to show
```

fricas [F] time = 0.93, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^3b^2x^2 + 2\,A^3abx + A^3a^2 + \left(B^3b^2x^2 + 2\,B^3abx + B^3a^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,\big(AB^2b^2x^2 + 2\,AB^2ab$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fric
as")
```

```
[Out] integral(A^3*b^2*x^2 + 2*A^3*a*b*x + A^3*a^2 + (B^3*b^2*x^2 + 2*B^3*a*b*x +
 B^3*a^2)*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*(A*B^2*b^2*x^2 + 2*A*B^2*a*b
*x + A*B^2*a^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*b^2*x^2 + 2*A^2
*B*a*b*x + A^2*B*a^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)^2 \left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

maple [F] time = 7.01, size = 0, normalized size = 0.00

$$\int (bx+a)^2 \left(B\ln\left(e\,(bx+a)^n\,(dx+c)^{-n}\right)+A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxi
ma")
```

```
[Out] A^2*B*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^3*b^2*x^3 + 3*A^2*B*a*
b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^3*a*b*x^2 + 3*A^2*B*a^2*x*log((b*x
 + a)^n*e/(d*x + c)^n) + A^3*a^2*x + 3*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A^2*B*a^2/e - 3*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/
d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*a*b/e + 1/2*(2*a^3*e*n*log(b*x + a
)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(
b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A^2*B*b^2/e - 1/6*(2*(B^3*b^3*d^3*
x^3 + 3*B^3*a*b^2*d^3*x^2 + 3*B^3*a^2*b*d^3*x)*log((d*x + c)^n)^3 - 3*(2*B^
3*a^3*d^3*n*log(b*x + a) - 2*(b^3*c^3*n - 3*a*b^2*c^2*d*n + 3*a^2*b*c*d^2*n
)*B^3*log(d*x + c) + 2*(B^3*b^3*d^3*log(e) + A*B^2*b^3*d^3)*x^3 + (6*A*B^2*
a*b^2*d^3 + (a*b^2*d^3*(n + 6*log(e)) - b^3*c*d^2*n)*B^3)*x^2 + 2*(3*A*B^2*
a^2*b*d^3 + (a^2*b*d^3*(2*n + 3*log(e)) + b^3*c^2*d*n - 3*a*b^2*c*d^2*n)*B^
3)*x + 2*(B^3*b^3*d^3*x^3 + 3*B^3*a*b^2*d^3*x^2 + 3*B^3*a^2*b*d^3*x)*log((b
*x + a)^n))*log((d*x + c)^n)^2)/(b*d^3) - integrate(-(B^3*a^2*b*c*d^2*log(e
)^3 + 3*A*B^2*a^2*b*c*d^2*log(e)^2 + (B^3*b^3*d^3*log(e)^3 + 3*A*B^2*b^3*d^
3*log(e)^2)*x^3 + (B^3*b^3*d^3*x^3 + B^3*a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2
*d^3)*B^3*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*B^3*x)*log((b*x + a)^n)^3 + (3*
(b^3*c*d^2*log(e)^2 + 2*a*b^2*d^3*log(e)^2)*A*B^2 + (b^3*c*d^2*log(e)^3 + 2
*a*b^2*d^3*log(e)^3)*B^3)*x^2 + 3*(B^3*a^2*b*c*d^2*log(e) + A*B^2*a^2*b*c*d
^2 + (B^3*b^3*d^3*log(e) + A*B^2*b^3*d^3)*x^3 + ((b^3*c*d^2 + 2*a*b^2*d^3)*
A*B^2 + (b^3*c*d^2*log(e) + 2*a*b^2*d^3*log(e))*B^3)*x^2 + ((2*a*b^2*c*d^2
```

```
+ a^2*b*d^3)*A*B^2 + (2*a*b^2*c*d^2*log(e) + a^2*b*d^3*log(e))*B^3)*x)*log(
(b*x + a)^n)^2 + (3*(2*a*b^2*c*d^2*log(e)^2 + a^2*b*d^3*log(e)^2)*A*B^2 + (
2*a*b^2*c*d^2*log(e)^3 + a^2*b*d^3*log(e)^3)*B^3)*x + 3*(B^3*a^2*b*c*d^2*lo
g(e)^2 + 2*A*B^2*a^2*b*c*d^2*log(e) + (B^3*b^3*d^3*log(e)^2 + 2*A*B^2*b^3*d
^3*log(e))*x^3 + (2*(b^3*c*d^2*log(e) + 2*a*b^2*d^3*log(e))*A*B^2 + (b^3*c*
d^2*log(e)^2 + 2*a*b^2*d^3*log(e)^2)*B^3)*x^2 + (2*(2*a*b^2*c*d^2*log(e) +
a^2*b*d^3*log(e))*A*B^2 + (2*a*b^2*c*d^2*log(e)^2 + a^2*b*d^3*log(e)^2)*B^3
)*x)*log((b*x + a)^n) - (2*B^3*a^3*d^3*n^2*log(b*x + a) + 3*B^3*a^2*b*c*d^2
*log(e)^2 + 6*A*B^2*a^2*b*c*d^2*log(e) - 2*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2
 + 3*a^2*b*c*d^2*n^2)*B^3*log(d*x + c) + ((2*n*log(e) + 3*log(e)^2)*B^3*b^3
*d^3 + 2*A*B^2*b^3*d^3*(n + 3*log(e)))*x^3 + (6*(a*b^2*d^3*(n + 2*log(e)) +
 b^3*c*d^2*log(e))*A*B^2 - ((n^2 - 3*log(e)^2)*b^3*c*d^2 - (n^2 + 6*n*log(e
) + 6*log(e)^2)*a*b^2*d^3)*B^3)*x^2 + 3*(B^3*b^3*d^3*x^3 + B^3*a^2*b*c*d^2
+ (b^3*c*d^2 + 2*a*b^2*d^3)*B^3*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*B^3*x)*lo
g((b*x + a)^n)^2 + (6*(a^2*b*d^3*(n + log(e)) + 2*a*b^2*c*d^2*log(e))*A*B^2
 + (2*b^3*c^2*d*n^2 - 6*(n^2 - log(e)^2)*a*b^2*c*d^2 + (4*n^2 + 6*n*log(e)
+ 3*log(e)^2)*a^2*b*d^3)*B^3)*x + 2*(3*B^3*a^2*b*c*d^2*log(e) + 3*A*B^2*a^2
*b*c*d^2 + (B^3*b^3*d^3*(n + 3*log(e)) + 3*A*B^2*b^3*d^3)*x^3 + 3*((b^3*c*d
^2 + 2*a*b^2*d^3)*A*B^2 + (a*b^2*d^3*(n + 2*log(e)) + b^3*c*d^2*log(e))*B^3
)*x^2 + 3*((2*a*b^2*c*d^2 + a^2*b*d^3)*A*B^2 + (a^2*b*d^3*(n + log(e)) + 2*
a*b^2*c*d^2*log(e))*B^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^3*x +
b*c*d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)^3\,{\left(a+b\,x\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x)^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x)^2, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.166 $\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$

Optimal. Leaf size=376

$$-\frac{3B^2n^2(bc-ad)^2\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bd^2}-\frac{3B^2n^2(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\Big(B\log\big(e(a+bx)}{bd^2}$$

```
[Out] -3*B^2*(-a*d+b*c)^2*n^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+
c)^n)))/b/d^2-3/2*B*(-a*d+b*c)*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^
2/b/d-3/2*B*(-a*d+b*c)^2*n*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d
*x+c)^n)))^2/b/d^2+1/2*(b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/b-3*B^
3*(-a*d+b*c)^2*n^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^2-3*B^2*(-a*d+b*c)^2*
n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^2+
3*B^3*(-a*d+b*c)^2*n^3*polylog(3,d*(b*x+a)/b/(d*x+c))/b/d^2
```

Rubi [**A**] time = 1.18, antiderivative size = 700, normalized size of antiderivative = 1.86, number of steps used = 27, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$-\frac{3AB^2n^2(bc-ad)^2\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}-\frac{3B^3n^2(bc-ad)^2\mathrm{PolyLog}\left(2,1-\frac{bc-ad}{b(c+dx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{bd^2}-3B$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (-3*A^2*B*(b*c - a*d)*n*x)/(2*d) + (A^3*(a + b*x)^2)/(2*b) + (3*A^2*B*(b*c
 - a*d)^2*n*Log[c + d*x])/(2*b*d^2) + (3*A*B^2*(b*c - a*d)^2*n^2*Log[c + d*x
])/(b*d^2) - (3*A*B^2*(b*c - a*d)*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(b*d) + (3*A^2*B*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b) -
 (3*A*B^2*(b*c - a*d)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n
)/(c + d*x)^n])/(b*d^2) - (3*B^3*(b*c - a*d)^2*n^2*Log[(b*c - a*d)/(b*(c +
d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) - (3*B^3*(b*c - a*d)*n*(a
+ b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b*d) + (3*A*B^2*(a + b*x)^2*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b) - (3*B^3*(b*c - a*d)^2*n*Log[(b*c
 - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b*d^2) + (B^3*
(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(2*b) - (3*A*B^2*(b*c - a*d
)^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) - (3*B^3*(b*c - a*
d)^2*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) - (3*B^3*(b*c - a
*d)^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c
 + d*x))])/(b*d^2) + (3*B^3*(b*c - a*d)^2*n^3*PolyLog[3, 1 - (b*c - a*d)/(b
*(c + d*x))])/(b*d^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
```

```
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx=\int\left(A^3(a+bx)+3A^2B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+\right.$$

$$=\frac{A^3(a+bx)^2}{2b}+\left(3A^2B\right)\int(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)$$

$$=\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b}+$$

$$=\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b}+$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c}{2bd^2}$$

Mathematica [B] time = 3.09, size = 3813, normalized size = 10.14

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (4*a^2*B^3*d^2*n^3*Log[a + b*x]^3 - 6*a^2*B^2*d^2*n^2*Log[a + b*x]^2*(2*A -
 B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 6*a^2*B
*d^2*n*Log[a + b*x]*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B^2*n^2*Log[c + d*x]^2 -
 2*B*(-2*A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^2 + 2*B*n*Log[c + d*x]*(2*A - B*n + 2*B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])) + b*(4*B^3*c*(b*c - 2*a*d)*n^3*Log[c + d*x]^3 + 6*B^2*d^2*
n^2*x*(2*a + b*x)*Log[c + d*x]^2*(2*A - B*n + 2*B*Log[(e*(a + b*x)^n)/(c +
d*x)^n]) + 6*B*d^2*n*x*(2*a + b*x)*Log[c + d*x]*(2*A^2 - 2*A*B*n + B^2*n^2
- 2*B*(-2*A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(a + b*x
)^n)/(c + d*x)^n]^2) + d^2*x*(2*a + b*x)*(4*A^3 - 6*A^2*B*n + 6*A*B^2*n^2 -
 3*B^3*n^3 + 6*B*(2*A^2 - 2*A*B*n + B^2*n^2)*Log[(e*(a + b*x)^n)/(c + d*x)^
n] - 6*B^2*(-2*A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 4*B^3*Log[(e*(
a + b*x)^n)/(c + d*x)^n]^3)))/(8*b*d^2) - (3*B*n*(-8*a*A*b*B*c*d*n + 16*a^2
*A*B*d^2*n - 8*b^2*B^2*c^2*n^2 + 16*a*b*B^2*c*d*n^2 - 8*a^2*B^2*d^2*n^2 + 4
*A^2*b^2*c*d*x - 8*a*A^2*b*d^2*x + 4*a*A*b*B*d^2*n*x - 2*a*b*B^2*d^2*n^2*x
- 2*A^2*b^2*d^2*x^2 + 2*A*b^2*B*d^2*n*x^2 - b^2*B^2*d^2*n^2*x^2 + 8*a*A*b*B
*c*d*n*Log[a + b*x] - 12*a^2*A*B*d^2*n*Log[a + b*x] + 8*a*b*B^2*c*d*n^2*Log
[a + b*x] - 14*a^2*B^2*d^2*n^2*Log[a + b*x] - 4*a*b*B^2*c*d*n^2*Log[a + b*x
]^2 + 6*a^2*B^2*d^2*n^2*Log[a + b*x]^2 - 4*A^2*b^2*c^2*Log[c + d*x] + 8*a*A
^2*b*c*d*Log[c + d*x] - 8*A*b^2*B*c^2*n*Log[c + d*x] + 8*a*A*b*B*c*d*n*Log[
c + d*x] - 8*a*b*B^2*c*d*n^2*Log[c + d*x] + 16*a^2*B^2*d^2*n^2*Log[c + d*x]
 + 8*a*A^2*b*d^2*x*Log[c + d*x] - 8*a*A*b*B*d^2*n*x*Log[c + d*x] + 4*a*b*B^
2*d^2*n^2*x*Log[c + d*x] + 4*A^2*b^2*d^2*x^2*Log[c + d*x] - 4*A*b^2*B*d^2*n
*x^2*Log[c + d*x] + 2*b^2*B^2*d^2*n^2*x^2*Log[c + d*x] + 8*A*b^2*B*c^2*n*Lo
g[a + b*x]*Log[c + d*x] - 16*a*A*b*B*c*d*n*Log[a + b*x]*Log[c + d*x] + 8*a^
2*A*B*d^2*n*Log[a + b*x]*Log[c + d*x] - 4*b^2*B^2*c^2*n^2*Log[a + b*x]*Log[
c + d*x] + 16*a*b*B^2*c*d*n^2*Log[a + b*x]*Log[c + d*x] - 16*a^2*B^2*d^2*n^
2*Log[a + b*x]*Log[c + d*x] - 4*b^2*B^2*c^2*n^2*Log[a + b*x]^2*Log[c + d*x]
 + 8*a*b*B^2*c*d*n^2*Log[a + b*x]^2*Log[c + d*x] - 4*a^2*B^2*d^2*n^2*Log[a
+ b*x]^2*Log[c + d*x] + 12*b^2*B^2*c^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)
]*Log[c + d*x] - 24*a*b*B^2*c*d*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
 + d*x] + 12*a^2*B^2*d^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]
 - 4*A*b^2*B*c^2*n*Log[c + d*x]^2 + 8*a*A*b*B*c*d*n*Log[c + d*x]^2 - 4*b^2*
B^2*c^2*n^2*Log[c + d*x]^2 + 4*a*b*B^2*c*d*n^2*Log[c + d*x]^2 + 8*a*A*b*B*d
^2*n*x*Log[c + d*x]^2 - 4*a*b*B^2*d^2*n^2*x*Log[c + d*x]^2 + 4*A*b^2*B*d^2*
n*x^2*Log[c + d*x]^2 - 2*b^2*B^2*d^2*n^2*x^2*Log[c + d*x]^2 + 8*b^2*B^2*c^2
*n^2*Log[a + b*x]*Log[c + d*x]^2 - 16*a*b*B^2*c*d*n^2*Log[a + b*x]*Log[c +
d*x]^2 + 8*a^2*B^2*d^2*n^2*Log[a + b*x]*Log[c + d*x]^2 - 4*b^2*B^2*c^2*n^2*
Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 + 8*a*b*B^2*c*d*n^2*Log[(d
*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 - 4*a^2*B^2*d^2*n^2*Log[(d*(a +
b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 - 8*A*b^2*B*c^2*n*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)] + 16*a*A*b*B*c*d*n*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)] - 8*a^2*A*B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] +
 4*b^2*B^2*c^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 8*a*b*B^2*
c*d*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 4*a^2*B^2*d^2*n^2*Log
[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 4*b^2*B^2*c^2*n^2*Log[a + b*x]^2
*Log[(b*(c + d*x))/(b*c - a*d)] - 8*a*b*B^2*c*d*n^2*Log[a + b*x]^2*Log[(b*(
c + d*x))/(b*c - a*d)] + 4*a^2*B^2*d^2*n^2*Log[a + b*x]^2*Log[(b*(c + d*x))
/(b*c - a*d)] - 8*b^2*B^2*c^2*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c + d*x
))/(b*c - a*d)] + 16*a*b*B^2*c*d*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c +
d*x))/(b*c - a*d)] - 8*a^2*B^2*d^2*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c
+ d*x))/(b*c - a*d)] - 8*a*b*B^2*c*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 1
```

```
6*a^2*B^2*d^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*A*b^2*B*c*d*x*Log[(e*(
a + b*x)^n)/(c + d*x)^n] - 16*a*A*b*B*d^2*x*Log[(e*(a + b*x)^n)/(c + d*x)^n
] + 4*a*b*B^2*d^2*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 4*A*b^2*B*d^2*x^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*b^2*B^2*d^2*n*x^2*Log[(e*(a + b*x)^n)/
(c + d*x)^n] + 8*a*b*B^2*c*d*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n
] - 12*a^2*B^2*d^2*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 8*A*b^
2*B*c^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 16*a*A*b*B*c*d*Log[
c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 8*b^2*B^2*c^2*n*Log[c + d*x]*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a*b*B^2*c*d*n*Log[c + d*x]*Log[(e*(a + b
*x)^n)/(c + d*x)^n] + 16*a*A*b*B*d^2*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n] - 8*a*b*B^2*d^2*n*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 + 8*A*b^2*B*d^2*x^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 4*b^2*
B^2*d^2*n*x^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*b^2*B^2*c^2
*n*Log[a + b*x]*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 16*a*b*B^2*
c*d*n*Log[a + b*x]*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a^2*B^
2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 4*b^2*
B^2*c^2*n*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a*b*B^2*c*d*n
*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a*b*B^2*d^2*n*x*Log[c
+ d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 4*b^2*B^2*d^2*n*x^2*Log[c + d*x
]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 8*b^2*B^2*c^2*n*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 16*a*b*B^2*c*d*n
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c + d*x)^
n] - 8*a^2*B^2*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*(a
+ b*x)^n)/(c + d*x)^n] + 4*b^2*B^2*c*d*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2
 - 8*a*b*B^2*d^2*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 2*b^2*B^2*d^2*x^2*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 4*b^2*B^2*c^2*Log[c + d*x]*Log[(e*(a +
b*x)^n)/(c + d*x)^n]^2 + 8*a*b*B^2*c*d*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2 + 8*a*b*B^2*d^2*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]
^2 + 4*b^2*B^2*d^2*x^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 4*
B*(b*c - a*d)^2*n*(2*A - B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 4*B^2*(b*c - a*d)
^2*n^2*(-3 + 2*Log[c + d*x])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 8*b^2*
B^2*c^2*n^2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] - 16*a*b*B^2*c*d*n^2*P
olyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] + 8*a^2*B^2*d^2*n^2*PolyLog[3, (d*(
a + b*x))/(-(b*c) + a*d)] + 8*b^2*B^2*c^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c
 - a*d)] - 16*a*b*B^2*c*d*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 8*a^2
*B^2*d^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]))/(8*b*d^2)
```

fricas **[F]** time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(A^3bx + A^3a + \left(B^3bx + B^3a\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\left(AB^2bx + AB^2a\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\left(A^2Bbx + A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fricas
")
```

```
[Out] integral(A^3*b*x + A^3*a + (B^3*b*x + B^3*a)*log((b*x + a)^n*e/(d*x + c)^n)
^3 + 3*(A*B^2*b*x + A*B^2*a)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*b*
x + A^2*B*a)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int (bx+a)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

maple [F] time = 10.05, size = 0, normalized size = 0.00

$$\int (bx+a)\left(B\ln\left(e\,(bx+a)^{n}\,(dx+c)^{-n}\right)+A\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxima
")
```

```
[Out] 3/2*A^2*B*b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^3*b*x^2 + 3*A^2*B*a*
x*log((b*x + a)^n*e/(d*x + c)^n) + A^3*a*x + 3*(a*e*n*log(b*x + a)/b - c*e*
n*log(d*x + c)/d)*A^2*B*a/e - 3/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d
*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*b/e - 1/2*((B^3*b^2*d^2*x^
2 + 2*B^3*a*b*d^2*x)*log((d*x + c)^n)^3 - 3*(B^3*a^2*d^2*n*log(b*x + a) + (
b^2*c^2*n - 2*a*b*c*d*n)*B^3*log(d*x + c) + (B^3*b^2*d^2*log(e) + A*B^2*b^2
*d^2)*x^2 + (2*A*B^2*a*b*d^2 + (a*b*d^2*(n + 2*log(e)) - b^2*c*d*n)*B^3)*x
+ (B^3*b^2*d^2*x^2 + 2*B^3*a*b*d^2*x)*log((b*x + a)^n))*log((d*x + c)^n)^2)
/(b*d^2) - integrate(-(B^3*a*b*c*d*log(e)^3 + 3*A*B^2*a*b*c*d*log(e)^2 + (B
^3*b^2*d^2*x^2 + B^3*a*b*c*d + (b^2*c*d + a*b*d^2)*B^3*x)*log((b*x + a)^n)^
3 + (B^3*b^2*d^2*log(e)^3 + 3*A*B^2*b^2*d^2*log(e)^2)*x^2 + 3*(B^3*a*b*c*d*
log(e) + A*B^2*a*b*c*d + (B^3*b^2*d^2*log(e) + A*B^2*b^2*d^2)*x^2 + ((b^2*c
*d + a*b*d^2)*A*B^2 + (b^2*c*d*log(e) + a*b*d^2*log(e))*B^3)*x)*log((b*x +
a)^n)^2 + (3*(b^2*c*d*log(e)^2 + a*b*d^2*log(e)^2)*A*B^2 + (b^2*c*d*log(e)^
3 + a*b*d^2*log(e)^3)*B^3)*x + 3*(B^3*a*b*c*d*log(e)^2 + 2*A*B^2*a*b*c*d*lo
g(e) + (B^3*b^2*d^2*log(e)^2 + 2*A*B^2*b^2*d^2*log(e))*x^2 + (2*(b^2*c*d*lo
g(e) + a*b*d^2*log(e))*A*B^2 + (b^2*c*d*log(e)^2 + a*b*d^2*log(e)^2)*B^3)*x
)*log((b*x + a)^n) - 3*(B^3*a^2*d^2*n^2*log(b*x + a) + B^3*a*b*c*d*log(e)^2
 + 2*A*B^2*a*b*c*d*log(e) + (b^2*c^2*n^2 - 2*a*b*c*d*n^2)*B^3*log(d*x + c)
+ ((n*log(e) + log(e)^2)*B^3*b^2*d^2 + A*B^2*b^2*d^2*(n + 2*log(e)))*x^2 +
(B^3*b^2*d^2*x^2 + B^3*a*b*c*d + (b^2*c*d + a*b*d^2)*B^3*x)*log((b*x + a)^n
)^2 + (2*(a*b*d^2*(n + log(e)) + b^2*c*d*log(e))*A*B^2 - ((n^2 - log(e)^2)*
b^2*c*d - (n^2 + 2*n*log(e) + log(e)^2)*a*b*d^2)*B^3)*x + (2*B^3*a*b*c*d*lo
g(e) + 2*A*B^2*a*b*c*d + (B^3*b^2*d^2*(n + 2*log(e)) + 2*A*B^2*b^2*d^2)*x^2
 + 2*((b^2*c*d + a*b*d^2)*A*B^2 + (a*b*d^2*(n + log(e)) + b^2*c*d*log(e))*B
^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^2*x + b*c*d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3\,\left(a+b\,x\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3*(a + b*x), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.167 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{a+bx}\,dx$

Optimal. Leaf size=186

$$\frac{6B^2n^2\text{Li}_3\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{b}+\frac{3Bn\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{b}-$$

```
[Out] -(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3*ln(1-b*(d*x+c)/d/(b*x+a))/b+3*B*n*(A+B
*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*polylog(2,b*(d*x+c)/d/(b*x+a))/b+6*B^2*n^2*
(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(3,b*(d*x+c)/d/(b*x+a))/b+6*B^3*n^
3*polylog(4,b*(d*x+c)/d/(b*x+a))/b
```

Rubi [B] time = 0.85, antiderivative size = 424, normalized size of antiderivative = 2.28, number of steps used = 14, number of rules used = 9, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {6742, 2488, 2411, 2343, 2333, 2315, 2506, 6610, 2508}

$$\frac{3A^2Bn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}+\frac{6AB^2n\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{6AB^2n^2\text{PolyLo}}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x),x]
```

```
[Out] (A^3*Log[a + b*x])/b - (3*A^2*B*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a
 + b*x)^n)/(c + d*x)^n])/b - (3*A*B^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log
[(e*(a + b*x)^n)/(c + d*x)^n]^2)/b - (B^3*Log[-((b*c - a*d)/(d*(a + b*x)))]
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/b + (3*A^2*B*n*PolyLog[2, 1 + (b*c - a
*d)/(d*(a + b*x))])/b + (6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog
[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (3*B^3*n*Log[(e*(a + b*x)^n)/(c + d
*x)^n]^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (6*A*B^2*n^2*PolyLo
g[3, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (6*B^3*n^3*PolyLog
[4, 1 + (b*c - a*d)/(d*(a + b*x))])/b
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{a+bx}\,dx = \int\left(\frac{A^3}{a+bx}+\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}+\frac{3AB^2\log^2\left(e(a\right.}{a}\right.$$

$$= \frac{A^3\log(a+bx)}{b}+\left(3A^2B\right)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\,dx+\left(3A\right.$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

Mathematica [B] time = 0.99, size = 2513, normalized size = 13.51

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x),x]
```

```
[Out] (4*A^3*Log[a + b*x] - 6*A^2*B*n*Log[a + b*x]^2 + 4*A*B^2*n^2*Log[a + b*x]^3
 - B^3*n^3*Log[a + b*x]^4 + B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^4 - 4
*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^3*Log[-((d*(a + b*x))/(b*(c + d*
x)))] + 6*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^2*Log[-((d*(a + b*x))/(
b*(c + d*x)))]^2 - 4*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[-((d*(a
+ b*x))/(b*(c + d*x)))]^3 + B^3*n^3*Log[-((d*(a + b*x))/(b*(c + d*x)))]^4 -
 12*A*B^2*n^2*Log[a + b*x]*Log[c + d*x]^2 + 12*B^3*n^3*Log[a + b*x]^2*Log[c
 + d*x]^2 + 12*A*B^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 -
 12*B^3*n^3*Log[a + b*x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 -
 8*B^3*n^3*Log[a + b*x]*Log[c + d*x]^3 + 8*B^3*n^3*Log[(d*(a + b*x))/(-(b*c
) + a*d)]*Log[c + d*x]^3 + 12*A^2*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c -
 a*d)] - 12*A*B^2*n^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)] + 4*B^3
*n^3*Log[a + b*x]^3*Log[(b*(c + d*x))/(b*c - a*d)] + 8*B^3*n^3*Log[(d*(a +
b*x))/(-(b*c) + a*d)]^3*Log[(b*(c + d*x))/(b*c - a*d)] - 12*B^3*n^3*Log[(d*
(a + b*x))/(-(b*c) + a*d)]^2*Log[-((d*(a + b*x))/(b*(c + d*x)))]*Log[(b*(c
+ d*x))/(b*c - a*d)] + 24*A*B^2*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c + d
*x))/(b*c - a*d)] - 24*B^3*n^3*Log[a + b*x]^2*Log[c + d*x]*Log[(b*(c + d*x)
)/(b*c - a*d)] + 12*B^3*n^3*Log[a + b*x]*Log[c + d*x]^2*Log[(b*(c + d*x))/(
b*c - a*d)] + 6*B^3*n^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]^2 + 1
2*B^3*n^3*Log[a + b*x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[(b*(c + d*x))/
(b*c - a*d)]^2 - 18*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^2*Log[(b*(c +
 d*x))/(b*c - a*d)]^2 + 12*A^2*B*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)
^n] - 12*A*B^2*n*Log[a + b*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 4*B^3*n^
2*Log[a + b*x]^3*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 12*B^3*n^2*Log[a + b*x]
*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 12*B^3*n^2*Log[(d*(a + b
```

```
*x))/(-(b*c) + a*d)]*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 24*A
*B^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c +
 d*x)^n] - 12*B^3*n^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*
(a + b*x)^n)/(c + d*x)^n] + 24*B^3*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c
+ d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 12*A*B^2*Log[a + b*
x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 6*B^3*n*Log[a + b*x]^2*Log[(e*(a +
b*x)^n)/(c + d*x)^n]^2 + 12*B^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d
)]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 4*B^3*Log[a + b*x]*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^3 - 4*B^3*n^3*Log[-((d*(a + b*x))/(b*(c + d*x)))]^3*Log[(b
*c - a*d)/(b*c + b*d*x)] + 12*B*n*(A^2 + B^2*n^2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)]^2 + B^2*n^2*Log[c + d*x]^2 + 2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x
))/(b*c - a*d)] - 2*B^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*(Log[-((d*(a
+ b*x))/(b*(c + d*x)))] + Log[(b*(c + d*x))/(b*c - a*d)]) + 2*A*B*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*B*n*Lo
g[c + d*x]*(A - B*n*Log[a + b*x] + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))*Pol
yLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 12*B^3*n^3*Log[-((d*(a + b*x))/(b*(
c + d*x)))]^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 12*B^3*n^3*Log[(d*(
a + b*x))/(-(b*c) + a*d)]^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*
n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[-((d*(a + b*x))/(b*(c + d*x)))]*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)] + 12*B^3*n^3*Log[-((d*(a + b*x))/(b*(c
 + d*x)))]^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 24*A*B^2*n^2*Log[c + d
*x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^3*Log[a + b*x]*Log[c +
 d*x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 12*B^3*n^3*Log[c + d*x]^2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)] + 24*B^3*n^3*Log[a + b*x]*Log[(b*(c + d*
x))/(b*c - a*d)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^3*Log[(d*
(a + b*x))/(-(b*c) + a*d)]*Log[(b*(c + d*x))/(b*c - a*d)]*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)] + 24*B^3*n^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x
)^n]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*A*B^2*n^2*PolyLog[3, (d*(a
+ b*x))/(-(b*c) + a*d)] + 24*B^3*n^3*Log[-((d*(a + b*x))/(b*(c + d*x)))]*Po
lyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] - 24*B^3*n^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] + 24*B^3*n^3*Log[-((d*(a
 + b*x))/(b*(c + d*x)))]*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 24*A*B^2
*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 24*B^3*n^3*Log[-((d*(a + b*x))
/(b*(c + d*x)))]*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^2*Log[(e*
(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^
3*PolyLog[4, (d*(a + b*x))/(b*(c + d*x))])/(4*b)
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{bx+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x, algorithm="fricas
")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*x + a), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a), x)
```

maple [F] time = 3.34, size = 0, normalized size = 0.00

$$\int \frac{\left(B \ln \left(e \left(bx+a\right)^{n} \left(dx+c\right)^{-n}\right)+A\right)^{3}}{bx+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{B^{3} \log\left(bx+a\right) \log\left(\left(dx+c\right)^{n}\right)^{3}}{b}+\frac{A^{3} \log\left(bx+a\right)}{b}+\int \frac{B^{3} b c \log(e)^{3} + 3 \, A B^{2} b c \log(e)^{2} + 3 \, A^{2} B b c \log(e) + \bigl(B^{3}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x, algorithm="maxima
")
```

```
[Out] -B^3*log(b*x + a)*log((d*x + c)^n)^3/b + A^3*log(b*x + a)/b + integrate((B^
3*b*c*log(e)^3 + 3*A*B^2*b*c*log(e)^2 + 3*A^2*B*b*c*log(e) + (B^3*b*d*x + B
^3*b*c)*log((b*x + a)^n)^3 + 3*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*log(e
) + A*B^2*b*d)*x)*log((b*x + a)^n)^2 + 3*(B^3*b*c*log(e) + A*B^2*b*c + (B^3
*b*d*log(e) + A*B^2*b*d)*x + (B^3*b*d*n*x + B^3*a*d*n)*log(b*x + a) + (B^3*
b*d*x + B^3*b*c)*log((b*x + a)^n))*log((d*x + c)^n)^2 + (B^3*b*d*log(e)^3 +
 3*A*B^2*b*d*log(e)^2 + 3*A^2*B*b*d*log(e))*x + 3*(B^3*b*c*log(e)^2 + 2*A*B
^2*b*c*log(e) + A^2*B*b*c + (B^3*b*d*log(e)^2 + 2*A*B^2*b*d*log(e) + A^2*B*
b*d)*x)*log((b*x + a)^n) - 3*(B^3*b*c*log(e)^2 + 2*A*B^2*b*c*log(e) + A^2*B
*b*c + (B^3*b*d*x + B^3*b*c)*log((b*x + a)^n)^2 + (B^3*b*d*log(e)^2 + 2*A*B
^2*b*d*log(e) + A^2*B*b*d)*x + 2*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*log
(e) + A*B^2*b*d)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d*x^2 + a*b*c
+ (b^2*c + a*b*d)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3}{a+b\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(a + b*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(a + b*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a),x)
```

```
[Out] Timed out
```

3.168 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{(a+bx)^2}\,dx$

Optimal. Leaf size=184

$$-\frac{6B^2n^2(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)}-\frac{3Bn(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{(a+bx)(bc-ad)}-\frac{(c+dx)\big(}{}$$

```
[Out] -6*B^3*n^3*(d*x+c)/(-a*d+b*c)/(b*x+a)-6*B^2*n^2*(d*x+c)*(A+B*ln(e*(b*x+a)^n
/((d*x+c)^n)))/(-a*d+b*c)/(b*x+a)-3*B*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c
)^n)))^2/(-a*d+b*c)/(b*x+a)-(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a
*d+b*c)/(b*x+a)
```

Rubi **[A]** time = 0.31, antiderivative size = 360, normalized size of antiderivative = 1.96, number of steps used = 11, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.091$, Rules used = {6742, 2490, 32}

$$-\frac{3A^2B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{3A^2Bn}{b(a+bx)}-\frac{A^3}{b(a+bx)}-\frac{3AB^2(c+dx)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-6A$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^2,x]
```

```
[Out] -(A^3/(b*(a + b*x))) - (3*A^2*B*n)/(b*(a + b*x)) - (6*A*B^2*n^2)/(b*(a + b*
x)) - (6*B^3*n^3)/(b*(a + b*x)) - (3*A^2*B*(c + d*x)*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/((b*c - a*d)*(a + b*x)) - (6*A*B^2*n*(c + d*x)*Log[(e*(a + b*x)
^n)/(c + d*x)^n])/((b*c - a*d)*(a + b*x)) - (6*B^3*n^2*(c + d*x)*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/((b*c - a*d)*(a + b*x)) - (3*A*B^2*(c + d*x)*Log[(e
*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)*(a + b*x)) - (3*B^3*n*(c + d*x)*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)*(a + b*x)) - (B^3*(c + d*x
)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/((b*c - a*d)*(a + b*x))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(a+bx)^2}\,dx = \int \Bigg(\frac{A^3}{(a+bx)^2} + \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2} + \frac{3AB^2\log^2(e(}{(a}$$

$$= -\frac{A^3}{b(a+bx)} + \left(3A^2B\right)\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\,dx + \left(3AB^2\right)$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)} - \frac{3AB^2(c}{}$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2Bn}{b(a+bx)} - \frac{3A^2B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.}{(bc-ad)(a+bx)}$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2Bn}{b(a+bx)} - \frac{6AB^2n^2}{b(a+bx)} - \frac{3A^2B(c+dx)\log\left(e(a+b\right.}{(bc-ad)(a+b}$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2Bn}{b(a+bx)} - \frac{6AB^2n^2}{b(a+bx)} - \frac{6B^3n^3}{b(a+bx)} - \frac{3A^2B(c+dx)}{(bc}$$

Mathematica [B] time = 0.79, size = 524, normalized size = 2.85

$$\frac{-3Bdn(a+bx)\log(a+bx)\left(2B(A+Bn)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2Bn\log(c+dx)\left(B\log\left(e(a+bx)^n(c+d\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^2,x]
```

```
[Out] (-(B^3*d*n^3*(a + b*x)*Log[a + b*x]^3) + B^3*d*n^3*(a + b*x)*Log[c + d*x]^3
 + 3*B^2*d*n^2*(a + b*x)*Log[c + d*x]^2*(A + B*n + B*Log[(e*(a + b*x)^n)/(c
 + d*x)^n]) + 3*B^2*d*n^2*(a + b*x)*Log[a + b*x]^2*(A + B*n + B*n*Log[c + d
*x] + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 3*B*d*n*(a + b*x)*Log[c + d*x]*
(A^2 + 2*A*B*n + 2*B^2*n^2 + 2*B*(A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 + B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2) - (b*c - a*d)*(A^3 + 3*A^2*B*n +
 6*A*B^2*n^2 + 6*B^3*n^3 + 3*B*(A^2 + 2*A*B*n + 2*B^2*n^2)*Log[(e*(a + b*x)
^n)/(c + d*x)^n] + 3*B^2*(A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + B^3
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3) - 3*B*d*n*(a + b*x)*Log[a + b*x]*(A^2
+ 2*A*B*n + 2*B^2*n^2 + B^2*n^2*Log[c + d*x]^2 + 2*B*(A + B*n)*Log[(e*(a +
b*x)^n)/(c + d*x)^n] + B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*B*n*Log[c
 + d*x]*(A + B*n + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))/(b*(b*c - a*d)*(a
+ b*x))
```

fricas [B] time = 0.92, size = 825, normalized size = 4.48

$$-\frac{A^3bc - A^3ad + 6\left(B^3bc - B^3ad\right)n^3 + \left(B^3bdn^3x + B^3bcn^3\right)\log(bx+a)^3 - \left(B^3bdn^3x + B^3bcn^3\right)\log(dx+c)^3 -}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x, algorithm="fric
as")
```

```
[Out] -(A^3*b*c - A^3*a*d + 6*(B^3*b*c - B^3*a*d)*n^3 + (B^3*b*d*n^3*x + B^3*b*c*
n^3)*log(b*x + a)^3 - (B^3*b*d*n^3*x + B^3*b*c*n^3)*log(d*x + c)^3 + (B^3*b
*c - B^3*a*d)*log(e)^3 + 6*(A*B^2*b*c - A*B^2*a*d)*n^2 + 3*(B^3*b*c*n^3 + A
*B^2*b*c*n^2 + (B^3*b*d*n^3 + A*B^2*b*d*n^2)*x + (B^3*b*d*n^2*x + B^3*b*c*n
^2)*log(e))*log(b*x + a)^2 + 3*(B^3*b*c*n^3 + A*B^2*b*c*n^2 + (B^3*b*d*n^3
+ A*B^2*b*d*n^2)*x + (B^3*b*d*n^3*x + B^3*b*c*n^3)*log(b*x + a) + (B^3*b*d*
n^2*x + B^3*b*c*n^2)*log(e))*log(d*x + c)^2 + 3*(A*B^2*b*c - A*B^2*a*d + (B
^3*b*c - B^3*a*d)*n)*log(e)^2 + 3*(A^2*B*b*c - A^2*B*a*d)*n + 3*(2*B^3*b*c*
```

```
n^3 + 2*A*B^2*b*c*n^2 + A^2*B*b*c*n + (B^3*b*d*n*x + B^3*b*c*n)*log(e)^2 +
(2*B^3*b*d*n^3 + 2*A*B^2*b*d*n^2 + A^2*B*b*d*n)*x + 2*(B^3*b*c*n^2 + A*B^2*
b*c*n + (B^3*b*d*n^2 + A*B^2*b*d*n)*x)*log(e))*log(b*x + a) - 3*(2*B^3*b*c*
n^3 + 2*A*B^2*b*c*n^2 + A^2*B*b*c*n + (B^3*b*d*n^3*x + B^3*b*c*n^3)*log(b*x
 + a)^2 + (B^3*b*d*n*x + B^3*b*c*n)*log(e)^2 + (2*B^3*b*d*n^3 + 2*A*B^2*b*d
*n^2 + A^2*B*b*d*n)*x + 2*(B^3*b*c*n^3 + A*B^2*b*c*n^2 + (B^3*b*d*n^3 + A*B
^2*b*d*n^2)*x + (B^3*b*d*n^2*x + B^3*b*c*n^2)*log(e))*log(b*x + a) + 2*(B^3
*b*c*n^2 + A*B^2*b*c*n + (B^3*b*d*n^2 + A*B^2*b*d*n)*x)*log(e))*log(d*x + c
) + 3*(A^2*B*b*c - A^2*B*a*d + 2*(B^3*b*c - B^3*a*d)*n^2 + 2*(A*B^2*b*c - A
*B^2*a*d)*n)*log(e))/(a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^2, x)
```

maple [C] time = 20.96, size = 69354, normalized size = 376.92

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x)
```

```
[Out] result too large to display
```

maxima [B] time = 2.16, size = 1129, normalized size = 6.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x, algorithm="maxi
ma")
```

```
[Out] -B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^2*x + a*b) - (3*(d*e*n*log(b*x + a
)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) + e*n/(b^2*x + a*b))
*log((b*x + a)^n*e/(d*x + c)^n)^2/e + (3*(2*b*c*e^2*n^2 - 2*a*d*e^2*n^2 - (
b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a)^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)
*log(d*x + c)^2 + 2*(b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a) - 2*(b*d*e^2
*n^2*x + a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a))*log(d*x
+ c))*log((b*x + a)^n*e/(d*x + c)^n)/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d
)*x)*e) + (6*b*c*e^3*n^3 - 6*a*d*e^3*n^3 + (b*d*e^3*n^3*x + a*d*e^3*n^3)*lo
g(b*x + a)^3 - (b*d*e^3*n^3*x + a*d*e^3*n^3)*log(d*x + c)^3 - 3*(b*d*e^3*n^
3*x + a*d*e^3*n^3)*log(b*x + a)^2 - 3*(b*d*e^3*n^3*x + a*d*e^3*n^3 - (b*d*e
^3*n^3*x + a*d*e^3*n^3)*log(b*x + a))*log(d*x + c)^2 + 6*(b*d*e^3*n^3*x + a
*d*e^3*n^3)*log(b*x + a) - 3*(2*b*d*e^3*n^3*x + 2*a*d*e^3*n^3 + (b*d*e^3*n^
3*x + a*d*e^3*n^3)*log(b*x + a)^2 - 2*(b*d*e^3*n^3*x + a*d*e^3*n^3)*log(b*x
 + a))*log(d*x + c))/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x)*e^2))/e)*B^
3 - 3*A*B^2*(2*(d*e*n*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^
2*c - a*b*d) + e*n/(b^2*x + a*b))*log((b*x + a)^n*e/(d*x + c)^n)/e + (2*b*c
*e^2*n^2 - 2*a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a)^2 - (
b*d*e^2*n^2*x + a*d*e^2*n^2)*log(d*x + c)^2 + 2*(b*d*e^2*n^2*x + a*d*e^2*n^
2)*log(b*x + a) - 2*(b*d*e^2*n^2*x + a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2
```

```
*n^2)*log(b*x + a))*log(d*x + c))/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x
)*e^2)) - 3*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^2*x + a*b) - 3*(d*e*n
*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) + e*n/(b
^2*x + a*b))*A^2*B/e - 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^2*x + a*b)
 - A^3/(b^2*x + a*b)
```

mupad [B] time = 6.06, size = 474, normalized size = 2.58

$$-\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\left(\frac{3\,B\,b\,d\,A^2\,x^2+3\,B\,\left(a\,d+b\,c\right)\,A^2\,x+3\,B\,a\,c\,A^2}{b\,(a+b\,x)^2\,\left(c+d\,x\right)}+\frac{6\,d\,\left(n\,B^3+A\,B^2\right)\,\left(b^2\,n\,x^2\,\left(a\,d-b\,c\right)+\right.}{b^2\,\left(a\,d-b\,c\right)\,\left(a+b\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(a + b*x)^2,x)
```

```
[Out] - log((e*(a + b*x)^n)/(c + d*x)^n)*((3*A^2*B*a*c + 3*A^2*B*x*(a*d + b*c) +
3*A^2*B*b*d*x^2)/(b*(a + b*x)^2*(c + d*x)) + (6*d*(A*B^2 + B^3*n)*(b^2*n*x^
2*(a*d - b*c) + (a*b*c*n*(a*d - b*c))/d + (b*n*x*(a*d + b*c)*(a*d - b*c))/d
))/(b^2*(a*d - b*c)*(a + b*x)^2*(c + d*x))) - (A^3 + 6*B^3*n^3 + 6*A*B^2*n^
2 + 3*A^2*B*n)/(a*b + b^2*x) - log((e*(a + b*x)^n)/(c + d*x)^n)^2*((3*A*B^2
)/(a*b + b^2*x) + (3*B^3*n)/(a*b + b^2*x) - (3*d*(A*B^2 + B^3*n))/(b*(a*d -
 b*c))) - log((e*(a + b*x)^n)/(c + d*x)^n)^3*(B^3/(b*(a + b*x)) - (B^3*d)/(
b*(a*d - b*c))) - (B*d*n*atan((B*d*n*((b^2*c + a*b*d)/b + 2*b*d*x)*(A^2 + 2
*B^2*n^2 + 2*A*B*n)*3i)/((a*d - b*c)*(6*B^3*d*n^3 + 3*A^2*B*d*n + 6*A*B^2*d
*n^2)))*(A^2 + 2*B^2*n^2 + 2*A*B*n)*6i)/(b*(a*d - b*c))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**2,x)
```

```
[Out] Timed out
```

3.169 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{(a+bx)^3}\,dx$

Optimal. Leaf size=390

$$-\frac{3bB^2n^2(c+dx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{4(a+bx)^2(bc-ad)^2}+\frac{6B^2dn^2(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)^2}-3bBn$$

```
[Out] 6*B^3*d*n^3*(d*x+c)/(-a*d+b*c)^2/(b*x+a)-3/8*b*B^3*n^3*(d*x+c)^2/(-a*d+b*c)
^2/(b*x+a)^2+6*B^2*d*n^2*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*
c)^2/(b*x+a)-3/4*b*B^2*n^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*
d+b*c)^2/(b*x+a)^2+3*B*d*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*
d+b*c)^2/(b*x+a)-3/4*b*B*n*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-
a*d+b*c)^2/(b*x+a)^2+d*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*d+b*
c)^2/(b*x+a)-1/2*b*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*d+b*c)
^2/(b*x+a)^2
```

Rubi [B] time = 0.80, antiderivative size = 811, normalized size of antiderivative = 2.08, number of steps used = 21, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.242$, Rules used = {6742, 2492, 44, 2491, 2490, 32, 2509, 37}

$$-\frac{A^3}{2b(a+bx)^2}+\frac{3Bd^2n\log(a+bx)A^2}{2b(bc-ad)^2}-\frac{3Bd^2n\log(c+dx)A^2}{2b(bc-ad)^2}-\frac{3B\log\left(e(a+bx)^n(c+dx)^{-n}\right)A^2}{2b(a+bx)^2}+\frac{3BdnA^2}{2b(bc-ad)(a+}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^3,x]
```

```
[Out] -A^3/(2*b*(a + b*x)^2) - (3*A^2*B*n)/(4*b*(a + b*x)^2) + (3*A^2*B*d*n)/(2*b
*(b*c - a*d)*(a + b*x)) + (6*A*B^2*d*n^2)/(b*(b*c - a*d)*(a + b*x)) + (6*B^
3*d*n^3)/(b*(b*c - a*d)*(a + b*x)) - (3*A*b*B^2*n^2*(c + d*x)^2)/(4*(b*c -
a*d)^2*(a + b*x)^2) - (3*b*B^3*n^3*(c + d*x)^2)/(8*(b*c - a*d)^2*(a + b*x)^
2) + (3*A^2*B*d^2*n*Log[a + b*x])/(2*b*(b*c - a*d)^2) - (3*A^2*B*d^2*n*Log[
c + d*x])/(2*b*(b*c - a*d)^2) - (3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/
(2*b*(a + b*x)^2) + (6*A*B^2*d*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]
)/((b*c - a*d)^2*(a + b*x)) + (6*B^3*d*n^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/((b*c - a*d)^2*(a + b*x)) - (3*A*b*B^2*n*(c + d*x)^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(2*(b*c - a*d)^2*(a + b*x)^2) - (3*b*B^3*n^2*(c + d
*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*(b*c - a*d)^2*(a + b*x)^2) + (3*
A*B^2*d*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)^2*(a + b
*x)) + (3*B^3*d*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d
)^2*(a + b*x)) - (3*A*b*B^2*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)
/(2*(b*c - a*d)^2*(a + b*x)^2) - (3*b*B^3*n*(c + d*x)^2*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2)/(4*(b*c - a*d)^2*(a + b*x)^2) + (B^3*d*(c + d*x)*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^3)/((b*c - a*d)^2*(a + b*x)) - (b*B^3*(c + d*x)^2*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(2*(b*c - a*d)^2*(a + b*x)^2)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(a+bx)^3}\,dx = \int\Bigg(\frac{A^3}{(a+bx)^3} + \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3} + \frac{3AB^2\log^2(e(a+}{(a+}$$

$$= -\frac{A^3}{2b(a+bx)^2} + \left(3A^2B\right)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\,dx + \left(3AB^2\right)$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2} + \frac{\left(3AbB^2\right)\int\frac{(c+dx)}{}}{b}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2} + \frac{3AB^2d(c+dx)\,\mathrm{l}}{(bc-}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2Bn}{4b(a+bx)^2} + \frac{3A^2Bdn}{2b(bc-ad)(a+bx)} + \frac{3A^2Bd^2n\log(}{2b(bc-a}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2Bn}{4b(a+bx)^2} + \frac{3A^2Bdn}{2b(bc-ad)(a+bx)} + \frac{6AB^2dn^2}{b(bc-ad)(a+}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2Bn}{4b(a+bx)^2} + \frac{3A^2Bdn}{2b(bc-ad)(a+bx)} + \frac{6AB^2dn^2}{b(bc-ad)(a+}$$

Mathematica [A] time = 1.18, size = 693, normalized size = 1.78

$$-\frac{-6Bd^2n(a+bx)^2\log(a+bx)\left(2B(2A+3Bn)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2Bn\log(c+dx)\left(2B\log\left(e(a+bx)^n(c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^3,x]
```

```
[Out] -1/8*(-4*B^3*d^2*n^3*(a + b*x)^2*Log[a + b*x]^3 + 4*B^3*d^2*n^3*(a + b*x)^2
*Log[c + d*x]^3 + 6*B^2*d^2*n^2*(a + b*x)^2*Log[c + d*x]^2*(2*A + 3*B*n + 2
*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 6*B^2*d^2*n^2*(a + b*x)^2*Log[a + b*
x]^2*(2*A + 3*B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^
n]) + 6*B*d^2*n*(a + b*x)^2*Log[c + d*x]*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B
*(2*A + 3*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2) + (b*c - a*d)*(4*A^3*(b*c - a*d) + 3*B^3*n^3*(-15*a*d + b*
(c - 14*d*x)) + 6*A*B^2*n^2*(-7*a*d + b*(c - 6*d*x)) + 6*A^2*B*n*(-3*a*d +
b*(c - 2*d*x)) + 6*B*(2*A^2*(b*c - a*d) + B^2*n^2*(-7*a*d + b*(c - 6*d*x))
+ 2*A*B*n*(-3*a*d + b*(c - 2*d*x)))*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 6*B^
2*(2*A*(b*c - a*d) + B*n*(-3*a*d + b*(c - 2*d*x)))*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]^2 + 4*B^3*(b*c - a*d)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3) - 6*B*d^
2*n*(a + b*x)^2*Log[a + b*x]*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*n^2*Log[c
 + d*x]^2 + 2*B*(2*A + 3*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[
(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*B*n*Log[c + d*x]*(2*A + 3*B*n + 2*B*Log[
(e*(a + b*x)^n)/(c + d*x)^n])))/(b*(b*c - a*d)^2*(a + b*x)^2)
```

fricas [B] time = 0.73, size = 2244, normalized size = 5.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x, algorithm="fric
as")
```

```
[Out] -1/8*(4*A^3*b^2*c^2 - 8*A^3*a*b*c*d + 4*A^3*a^2*d^2 + 3*(B^3*b^2*c^2 - 16*B
^3*a*b*c*d + 15*B^3*a^2*d^2)*n^3 - 4*(B^3*b^2*d^2*n^3*x^2 + 2*B^3*a*b*d^2*n
```

```
^3*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n^3)*log(b*x + a)^3 + 4*(B^3*b^2*d^2*n
^3*x^2 + 2*B^3*a*b*d^2*n^3*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n^3)*log(d*x +
 c)^3 + 4*(B^3*b^2*c^2 - 2*B^3*a*b*c*d + B^3*a^2*d^2)*log(e)^3 + 6*(A*B^2*b
^2*c^2 - 8*A*B^2*a*b*c*d + 7*A*B^2*a^2*d^2)*n^2 + 6*((B^3*b^2*c^2 - 4*B^3*a
*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b*c*d)*n^2 - (3*B^3*b^2*d^2*n^3
+ 2*A*B^2*b^2*d^2*n^2)*x^2 - 2*(2*A*B^2*a*b*d^2*n^2 + (B^3*b^2*c*d + 2*B^3*
a*b*d^2)*n^3)*x - 2*(B^3*b^2*d^2*n^2*x^2 + 2*B^3*a*b*d^2*n^2*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^2)*log(e))*log(b*x + a)^2 + 6*((B^3*b^2*c^2 - 4*B^3*a
*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b*c*d)*n^2 - (3*B^3*b^2*d^2*n^3
+ 2*A*B^2*b^2*d^2*n^2)*x^2 - 2*(2*A*B^2*a*b*d^2*n^2 + (B^3*b^2*c*d + 2*B^3*
a*b*d^2)*n^3)*x - 2*(B^3*b^2*d^2*n^3*x^2 + 2*B^3*a*b*d^2*n^3*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^3)*log(b*x + a) - 2*(B^3*b^2*d^2*n^2*x^2 + 2*B^3*a*b*
d^2*n^2*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n^2)*log(e))*log(d*x + c)^2 + 6*(
2*A*B^2*b^2*c^2 - 4*A*B^2*a*b*c*d + 2*A*B^2*a^2*d^2 - 2*(B^3*b^2*c*d - B^3*
a*b*d^2)*n*x + (B^3*b^2*c^2 - 4*B^3*a*b*c*d + 3*B^3*a^2*d^2)*n)*log(e)^2 +
6*(A^2*B*b^2*c^2 - 4*A^2*B*a*b*c*d + 3*A^2*B*a^2*d^2)*n - 6*(7*(B^3*b^2*c*d
 - B^3*a*b*d^2)*n^3 + 6*(A*B^2*b^2*c*d - A*B^2*a*b*d^2)*n^2 + 2*(A^2*B*b^2*
c*d - A^2*B*a*b*d^2)*n)*x + 6*((B^3*b^2*c^2 - 8*B^3*a*b*c*d)*n^3 + 2*(A*B^2
*b^2*c^2 - 4*A*B^2*a*b*c*d)*n^2 - (7*B^3*b^2*d^2*n^3 + 6*A*B^2*b^2*d^2*n^2
+ 2*A^2*B*b^2*d^2*n)*x^2 - 2*(B^3*b^2*d^2*n*x^2 + 2*B^3*a*b*d^2*n*x - (B^3*
b^2*c^2 - 2*B^3*a*b*c*d)*n)*log(e)^2 + 2*(A^2*B*b^2*c^2 - 2*A^2*B*a*b*c*d)*
n - 2*(2*A^2*B*a*b*d^2*n + (3*B^3*b^2*c*d + 4*B^3*a*b*d^2)*n^3 + 2*(A*B^2*b
^2*c*d + 2*A*B^2*a*b*d^2)*n^2)*x + 2*((B^3*b^2*c^2 - 4*B^3*a*b*c*d)*n^2 - (
3*B^3*b^2*d^2*n^2 + 2*A*B^2*b^2*d^2*n)*x^2 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b
*c*d)*n - 2*(2*A*B^2*a*b*d^2*n + (B^3*b^2*c*d + 2*B^3*a*b*d^2)*n^2)*x)*log(
e))*log(b*x + a) - 6*((B^3*b^2*c^2 - 8*B^3*a*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2
- 4*A*B^2*a*b*c*d)*n^2 - (7*B^3*b^2*d^2*n^3 + 6*A*B^2*b^2*d^2*n^2 + 2*A^2*B
*b^2*d^2*n)*x^2 - 2*(B^3*b^2*d^2*n^3*x^2 + 2*B^3*a*b*d^2*n^3*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^3)*log(b*x + a)^2 - 2*(B^3*b^2*d^2*n*x^2 + 2*B^3*a*b*
d^2*n*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n)*log(e)^2 + 2*(A^2*B*b^2*c^2 - 2*
A^2*B*a*b*c*d)*n - 2*(2*A^2*B*a*b*d^2*n + (3*B^3*b^2*c*d + 4*B^3*a*b*d^2)*n
^3 + 2*(A*B^2*b^2*c*d + 2*A*B^2*a*b*d^2)*n^2)*x + 2*((B^3*b^2*c^2 - 4*B^3*a
*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b*c*d)*n^2 - (3*B^3*b^2*d^2*n^3
+ 2*A*B^2*b^2*d^2*n^2)*x^2 - 2*(2*A*B^2*a*b*d^2*n^2 + (B^3*b^2*c*d + 2*B^3*
a*b*d^2)*n^3)*x - 2*(B^3*b^2*d^2*n^2*x^2 + 2*B^3*a*b*d^2*n^2*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^2)*log(e))*log(b*x + a) + 2*((B^3*b^2*c^2 - 4*B^3*a*b
*c*d)*n^2 - (3*B^3*b^2*d^2*n^2 + 2*A*B^2*b^2*d^2*n)*x^2 + 2*(A*B^2*b^2*c^2
- 2*A*B^2*a*b*c*d)*n - 2*(2*A*B^2*a*b*d^2*n + (B^3*b^2*c*d + 2*B^3*a*b*d^2)
*n^2)*x)*log(e))*log(d*x + c) + 6*(2*A^2*B*b^2*c^2 - 4*A^2*B*a*b*c*d + 2*A^
2*B*a^2*d^2 + (B^3*b^2*c^2 - 8*B^3*a*b*c*d + 7*B^3*a^2*d^2)*n^2 + 2*(A*B^2*
b^2*c^2 - 4*A*B^2*a*b*c*d + 3*A*B^2*a^2*d^2)*n - 2*(3*(B^3*b^2*c*d - B^3*a*
b*d^2)*n^2 + 2*(A*B^2*b^2*c*d - A*B^2*a*b*d^2)*n)*x)*log(e))/(a^2*b^3*c^2 -
 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*
(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^3, x)
```

maple [C] time = 32.82, size = 120138, normalized size = 308.05

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x)
```

```
[Out] result too large to display
```

maxima [B] time = 2.76, size = 2246, normalized size = 5.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x, algorithm="maxi
ma")
```

```
[Out] -1/2*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^3*x^2 + 2*a*b^2*x + a^2*b) + 1
/8*(6*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*d^2*e
*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b*c*e*
n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3*c -
a^2*b^2*d)*x))*log((b*x + a)^n*e/(d*x + c)^n)^2/e - (6*(b^2*c^2*e^2*n^2 - 8
*a*b*c*d*e^2*n^2 + 7*a^2*d^2*e^2*n^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e
^2*n^2*x + a^2*d^2*e^2*n^2)*log(b*x + a)^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b
*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*log(d*x + c)^2 - 6*(b^2*c*d*e^2*n^2 - a*b
*d^2*e^2*n^2)*x - 6*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^
2*n^2)*log(b*x + a) + 2*(3*b^2*d^2*e^2*n^2*x^2 + 6*a*b*d^2*e^2*n^2*x + 3*a^
2*d^2*e^2*n^2 - 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*
n^2)*log(b*x + a))*log(d*x + c))*log((b*x + a)^n*e/(d*x + c)^n)/((a^2*b^3*c
^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2
+ 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)*e) + (3*b^2*c^2*e^3*n^3 -
48*a*b*c*d*e^3*n^3 + 45*a^2*d^2*e^3*n^3 - 4*(b^2*d^2*e^3*n^3*x^2 + 2*a*b*d^
2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a)^3 + 4*(b^2*d^2*e^3*n^3*x^2 + 2*
a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(d*x + c)^3 + 18*(b^2*d^2*e^3*n^3*x
^2 + 2*a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a)^2 + 6*(3*b^2*d^2*e
^3*n^3*x^2 + 6*a*b*d^2*e^3*n^3*x + 3*a^2*d^2*e^3*n^3 - 2*(b^2*d^2*e^3*n^3*x
^2 + 2*a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a))*log(d*x + c)^2 -
42*(b^2*c*d*e^3*n^3 - a*b*d^2*e^3*n^3)*x - 42*(b^2*d^2*e^3*n^3*x^2 + 2*a*b*
d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a) + 6*(7*b^2*d^2*e^3*n^3*x^2 +
14*a*b*d^2*e^3*n^3*x + 7*a^2*d^2*e^3*n^3 + 2*(b^2*d^2*e^3*n^3*x^2 + 2*a*b*d
^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a)^2 - 6*(b^2*d^2*e^3*n^3*x^2 + 2
*a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a))*log(d*x + c))/((a^2*b^3
*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^
2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)*e^2))/e)*B^3 + 3/4*A*B^2
*(2*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*d^2*e*n
*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b*c*e*n
+ 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e - (b^2*c^2*e^2*n^2 - 8*a*b*c*
d*e^2*n^2 + 7*a^2*d^2*e^2*n^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*
x + a^2*d^2*e^2*n^2)*log(b*x + a)^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^
2*n^2*x + a^2*d^2*e^2*n^2)*log(d*x + c)^2 - 6*(b^2*c*d*e^2*n^2 - a*b*d^2*e^
2*n^2)*x - 6*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*
log(b*x + a) + 2*(3*b^2*d^2*e^2*n^2*x^2 + 6*a*b*d^2*e^2*n^2*x + 3*a^2*d^2*e
^2*n^2 - 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*lo
g(b*x + a))*log(d*x + c))/((a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*
c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b
^2*d^2)*x)*e^2)) - 3/2*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^3*x^2 + 2*
a*b^2*x + a^2*b) + 3/4*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2
*b*d^2) - 2*d^2*e*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b
*d*e*n*x - b*c*e*n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^
2 + 2*(a*b^3*c - a^2*b^2*d)*x))*A^2*B/e - 3/2*A^2*B*log((b*x + a)^n*e/(d*x
+ c)^n)/(b^3*x^2 + 2*a*b^2*x + a^2*b) - 1/2*A^3/(b^3*x^2 + 2*a*b^2*x + a^2*
b)
```

mupad [B] time = 8.99, size = 966, normalized size = 2.48

$$-\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)^3\left(\frac{B^3}{2\,b\,\left(a^2+2\,a\,b\,x+b^2\,x^2\right)}-\frac{B^3\,d^2}{2\,b\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)-\frac{4\,A^3\,a\,d-4\,A^3\,b\,c+45\,B^3\,a\,d\,n^3-3\,B^3\,b\,c\,n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(a + b*x)^3,x)
```

```
[Out] - log((e*(a + b*x)^n)/(c + d*x)^n)^3*(B^3/(2*b*(a^2 + b^2*x^2 + 2*a*b*x)) -
 (B^3*d^2)/(2*b*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((4*A^3*a*d - 4*A^3*b*c
 + 45*B^3*a*d*n^3 - 3*B^3*b*c*n^3 + 18*A^2*B*a*d*n - 6*A^2*B*b*c*n + 42*A*B
^2*a*d*n^2 - 6*A*B^2*b*c*n^2)/(2*(a*d - b*c)) + (3*x*(7*B^3*b*d*n^3 + 2*A^2
*B*b*d*n + 6*A*B^2*b*d*n^2))/(a*d - b*c))/(4*a^2*b + 4*b^3*x^2 + 8*a*b^2*x)
 - log((e*(a + b*x)^n)/(c + d*x)^n)^2*((3*A*B^2)/(2*(a^2*b + b^3*x^2 + 2*a*
b^2*x)) - (3*d^2*(2*A*B^2 + 3*B^3*n))/(4*b*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))
 + (3*B^3*d^2*((b*n*(a*d - b*c)*(2*a*d - b*c))/d^2 + (2*b^2*n*x*(a*d - b*c)
)/d + (a*b*n*(a*d - b*c))/d))/(4*b*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d)*(a^2*b +
 b^3*x^2 + 2*a*b^2*x))) - log((e*(a + b*x)^n)/(c + d*x)^n)*((3*B*a*c*(A^2 -
 B^2*n^2) + 3*B*x*(a*d + b*c)*(A^2 - B^2*n^2) + 3*B*b*d*x^2*(A^2 - B^2*n^2)
)/(2*b*(a + b*x)^3*(c + d*x)) + (3*d^2*(2*A*B^2 + 3*B^3*n)*(x*(((b*n*(a*d -
 b*c)*(2*a*d - b*c))/d^2 + (a*b*n*(a*d - b*c))/d)*(a*d + b*c) + (2*a*b^2*c*
n*(a*d - b*c))/d) + x^2*(b*d*((b*n*(a*d - b*c)*(2*a*d - b*c))/d^2 + (a*b*n*
(a*d - b*c))/d) + (2*b^2*n*(a*d + b*c)*(a*d - b*c))/d) + a*c*((b*n*(a*d - b
*c)*(2*a*d - b*c))/d^2 + (a*b*n*(a*d - b*c))/d) + 2*b^3*n*x^3*(a*d - b*c)))
/(4*b^2*(a + b*x)^3*(c + d*x)*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - (B*d^2*n*
atan((B*d^2*n*(2*b*d*x - (b^3*c^2 - a^2*b*d^2)/(b*(a*d - b*c)))*(2*A^2 + 7*
B^2*n^2 + 6*A*B*n)*3i)/((a*d - b*c)*(21*B^3*d^2*n^3 + 6*A^2*B*d^2*n + 18*A*
B^2*d^2*n^2)))*(2*A^2 + 7*B^2*n^2 + 6*A*B*n)*3i)/(2*b*(a*d - b*c)^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**3,x)
```

```
[Out] Timed out
```

3.170 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{(a+bx)^4}\,dx$

Optimal. Leaf size=611

$$-\frac{2b^2B^2n^2(c+dx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{9(a+bx)^3(bc-ad)^3}-\frac{b^2Bn(c+dx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{3(a+bx)^3(bc-ad)^3}-b^2(c$$

```
[Out] -6*B^3*d^2*n^3*(d*x+c)/(-a*d+b*c)^3/(b*x+a)+3/4*b*B^3*d*n^3*(d*x+c)^2/(-a*d
+b*c)^3/(b*x+a)^2-2/27*b^2*B^3*n^3*(d*x+c)^3/(-a*d+b*c)^3/(b*x+a)^3-6*B^2*d
^2*n^2*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^3/(b*x+a)+3/2*b
*B^2*d*n^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^3/(b*x+a)
^2-2/9*b^2*B^2*n^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^3
/(b*x+a)^3-3*B*d^2*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)
^3/(b*x+a)+3/2*b*B*d*n*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+
b*c)^3/(b*x+a)^2-1/3*b^2*B*n*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/
(-a*d+b*c)^3/(b*x+a)^3-d^2*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*
d+b*c)^3/(b*x+a)+b*d*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*d+b*
c)^3/(b*x+a)^2-1/3*b^2*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*d+
b*c)^3/(b*x+a)^3
```

Rubi [C] time = 3.43, antiderivative size = 1876, normalized size of antiderivative = 3.07, number of steps used = 66, number of rules used = 16, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.485$, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315, 2491, 2509, 37, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^4,x]
```

```
[Out] -A^3/(3*b*(a + b*x)^3) - (A^2*B*n)/(3*b*(a + b*x)^3) - (2*A*B^2*n^2)/(9*b*(
a + b*x)^3) - (2*B^3*n^3)/(27*b*(a + b*x)^3) + (A^2*B*d*n)/(2*b*(b*c - a*d)
*(a + b*x)^2) + (5*A*B^2*d*n^2)/(6*b*(b*c - a*d)*(a + b*x)^2) + (5*B^3*d*n^
3)/(18*b*(b*c - a*d)*(a + b*x)^2) - (A^2*B*d^2*n)/(b*(b*c - a*d)^2*(a + b*x
)) - (11*A*B^2*d^2*n^2)/(3*b*(b*c - a*d)^2*(a + b*x)) - (47*B^3*d^2*n^3)/(9
*b*(b*c - a*d)^2*(a + b*x)) + (b*B^3*d*n^3*(c + d*x)^2)/(4*(b*c - a*d)^3*(a
 + b*x)^2) - (A^2*B*d^3*n*Log[a + b*x])/(b*(b*c - a*d)^3) - (5*A*B^2*d^3*n^
2*Log[a + b*x])/(3*b*(b*c - a*d)^3) - (5*B^3*d^3*n^3*Log[a + b*x])/(9*b*(b*
c - a*d)^3) + (A^2*B*d^3*n*Log[c + d*x])/(b*(b*c - a*d)^3) + (5*A*B^2*d^3*n
^2*Log[c + d*x])/(3*b*(b*c - a*d)^3) + (5*B^3*d^3*n^3*Log[c + d*x])/(9*b*(b
*c - a*d)^3) - (A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*(a + b*x)^3) - (
2*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(a + b*x)^3) - (2*B^3*n^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n])/(9*b*(a + b*x)^3) + (A*B^2*d*n*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(b*(b*c - a*d)*(a + b*x)^2) + (B^3*d*n^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)*(a + b*x)^2) - (2*A*B^2*d^2*n*(c +
 d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*c - a*d)^3*(a + b*x)) - (14*B^3
*d^2*n^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*(b*c - a*d)^3*(a +
b*x)) + (b*B^3*d*n^2*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*(b*c
- a*d)^3*(a + b*x)^2) + (2*A*B^2*d^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n])/(b*(b*c - a*d)^3) + (2*B^3*d^3*n^2*Log[-((b
*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d
)^3) - (2*A*B^2*d^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^2*Log[(b*c - a*d)/(b*(c + d*x)
)]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)^3) - (A*B^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/(b*(a + b*x)^3) - (B^3*n*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2)/(3*b*(a + b*x)^3) - (2*B^3*d^2*n*(c + d*x)*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2)/((b*c - a*d)^3*(a + b*x)) + (b*B^3*d*n*(c + d*x)^2*Log[(e*
```

```
(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*c - a*d)^3*(a + b*x)^2) + (B^3*d^3*n*Log
[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b*(b*c
- a*d)^3) - (B^3*d^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(
c + d*x)^n]^2)/(b*(b*c - a*d)^3) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)
/(3*b*(a + b*x)^3) - (2*A*B^2*d^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x
))])/(3*b*(b*c - a*d)^3) - (2*A*B^2*d^3*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(
a + b*x))])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^3*PolyLog[2, 1 + (b*c - a*d)/(
d*(a + b*x))])/(3*b*(b*c - a*d)^3) - (2*B^3*d^3*n^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*(b*c - a*d)^3) - (2
*B^3*d^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b
*(c + d*x))])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^3*PolyLog[3, 1 + (b*c - a*d)
/(d*(a + b*x))])/(b*(b*c - a*d)^3) + (2*B^3*d^3*n^3*PolyLog[3, 1 - (b*c - a
*d)/(b*(c + d*x))])/(b*(b*c - a*d)^3)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(a+bx)^4}\,dx = \int\left(\frac{A^3}{(a+bx)^4}+\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}+\frac{3AB^2\log^2\left(e(a+\right.}{(a+}\right.$$

$$= -\frac{A^3}{3b(a+bx)^3}+\left(3A^2B\right)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\,dx+\left(3AB^2\right)\int$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b(a+bx)^3}-\frac{AB^2\log^2\left(e(a+b\right.}{b(a+b}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b(a+bx)^3}-\frac{AB^2\log^2\left(e(a+b\right.}{b(a+b}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}+\frac{A^2Bdn}{2b(bc-ad)(a+bx)^2}-\frac{A^2Bd^2n}{b(bc-ad)^2(a}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}+\frac{A^2Bdn}{2b(bc-ad)(a+bx)^2}-\frac{A^2Bd^2n}{b(bc-ad)^2(a}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}+\frac{A^2Bdn}{2b(bc-ad)(a+bx)^2}-\frac{A^2Bd^2n}{b(bc-ad)^2(a}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}-\frac{2AB^2n^2}{9b(a+bx)^3}+\frac{A^2Bdn}{2b(bc-ad)(a+bx)^2}+$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}-\frac{2AB^2n^2}{9b(a+bx)^3}+\frac{A^2Bdn}{2b(bc-ad)(a+bx)^2}+$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}-\frac{2AB^2n^2}{9b(a+bx)^3}+\frac{A^2Bdn}{2b(bc-ad)(a+bx)^2}+$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}-\frac{2AB^2n^2}{9b(a+bx)^3}-\frac{2B^3n^3}{27b(a+bx)^3}+\frac{}{2b(bc-}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}-\frac{2AB^2n^2}{9b(a+bx)^3}-\frac{2B^3n^3}{27b(a+bx)^3}+\frac{}{2b(bc-}$$

$$= -\frac{A^3}{3b(a+bx)^3}-\frac{A^2Bn}{3b(a+bx)^3}-\frac{2AB^2n^2}{9b(a+bx)^3}-\frac{2B^3n^3}{27b(a+bx)^3}+\frac{}{2b(bc-}$$

Mathematica [**A**] time = 1.50, size = 1003, normalized size = 1.64

$$\frac{-36B^3d^3n^3\log^3(a+bx)(a+bx)^3+36B^3d^3n^3\log^3(c+dx)(a+bx)^3+18B^2d^3n^2\log^2(c+dx)\left(6A+11Bn+6B\,\mathrm{lo}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^4,x]
```

```
[Out] (-36*B^3*d^3*n^3*(a + b*x)^3*Log[a + b*x]^3 + 36*B^3*d^3*n^3*(a + b*x)^3*Lo
g[c + d*x]^3 + 18*B^2*d^3*n^2*(a + b*x)^3*Log[c + d*x]^2*(6*A + 11*B*n + 6*
```

```
B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 18*B^2*d^3*n^2*(a + b*x)^3*Log[a + b*
x]^2*(6*A + 11*B*n + 6*B*n*Log[c + d*x] + 6*B*Log[(e*(a + b*x)^n)/(c + d*x)
^n]) + 6*B*d^3*n*(a + b*x)^3*Log[c + d*x]*(18*A^2 + 66*A*B*n + 85*B^2*n^2 +
 6*B*(6*A + 11*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B^2*Log[(e*(a + b
*x)^n)/(c + d*x)^n]^2) - (b*c - a*d)*(36*A^3*b^2*c^2 - 72*a*A^3*b*c*d + 36*
a^2*A^3*d^2 + 36*A^2*b^2*B*c^2*n - 126*a*A^2*b*B*c*d*n + 198*a^2*A^2*B*d^2*
n + 24*A*b^2*B^2*c^2*n^2 - 138*a*A*b*B^2*c*d*n^2 + 510*a^2*A*B^2*d^2*n^2 +
8*b^2*B^3*c^2*n^3 - 73*a*b*B^3*c*d*n^3 + 575*a^2*B^3*d^2*n^3 - 54*A^2*b^2*B
*c*d*n*x + 270*a*A^2*b*B*d^2*n*x - 90*A*b^2*B^2*c*d*n^2*x + 882*a*A*b*B^2*d
^2*n^2*x - 57*b^2*B^3*c*d*n^3*x + 1077*a*b*B^3*d^2*n^3*x + 108*A^2*b^2*B*d^
2*n*x^2 + 396*A*b^2*B^2*d^2*n^2*x^2 + 510*b^2*B^3*d^2*n^3*x^2 + 6*B*(18*A^2
*(b*c - a*d)^2 + 6*A*B*n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 -
 3*c*d*x + 6*d^2*x^2)) + B^2*n^2*(85*a^2*d^2 + a*b*d*(-23*c + 147*d*x) + b^
2*(4*c^2 - 15*c*d*x + 66*d^2*x^2)))*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B
^2*(6*A*(b*c - a*d)^2 + B*n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^
2 - 3*c*d*x + 6*d^2*x^2)))*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 36*B^3*(b*c
 - a*d)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3) - 6*B*d^3*n*(a + b*x)^3*Log[a
 + b*x]*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*n^2*Log[c + d*x]^2 + 6*B*(
6*A + 11*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B^2*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2 + 6*B*n*Log[c + d*x]*(6*A + 11*B*n + 6*B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])))/(108*b*(b*c - a*d)^3*(a + b*x)^3)
```

fricas [B] time = 1.11, size = 4008, normalized size = 6.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x, algorithm="fric
as")
```

```
[Out] -1/108*(36*A^3*b^3*c^3 - 108*A^3*a*b^2*c^2*d + 108*A^3*a^2*b*c*d^2 - 36*A^3
*a^3*d^3 + (8*B^3*b^3*c^3 - 81*B^3*a*b^2*c^2*d + 648*B^3*a^2*b*c*d^2 - 575*
B^3*a^3*d^3)*n^3 + 36*(B^3*b^3*d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*B^
3*a^2*b*d^3*n^3*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n
^3)*log(b*x + a)^3 - 36*(B^3*b^3*d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*
B^3*a^2*b*d^3*n^3*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)
*n^3)*log(d*x + c)^3 + 36*(B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*
d^2 - B^3*a^3*d^3)*log(e)^3 + 6*(4*A*B^2*b^3*c^3 - 27*A*B^2*a*b^2*c^2*d + 1
08*A*B^2*a^2*b*c*d^2 - 85*A*B^2*a^3*d^3)*n^2 + 6*(85*(B^3*b^3*c*d^2 - B^3*a
*b^2*d^3)*n^3 + 66*(A*B^2*b^3*c*d^2 - A*B^2*a*b^2*d^3)*n^2 + 18*(A^2*B*b^3*
c*d^2 - A^2*B*a*b^2*d^3)*n)*x^2 + 18*((2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d +
18*B^3*a^2*b*c*d^2)*n^3 + (11*B^3*b^3*d^3*n^3 + 6*A*B^2*b^3*d^3*n^2)*x^3 +
6*(A*B^2*b^3*c^3 - 3*A*B^2*a*b^2*c^2*d + 3*A*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*
B^2*a*b^2*d^3*n^2 + (2*B^3*b^3*c*d^2 + 9*B^3*a*b^2*d^3)*n^3)*x^2 + 3*(6*A*B
^2*a^2*b*d^3*n^2 - (B^3*b^3*c^2*d - 6*B^3*a*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^
3)*x + 6*(B^3*b^3*d^3*n^2*x^3 + 3*B^3*a*b^2*d^3*n^2*x^2 + 3*B^3*a^2*b*d^3*n
^2*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^2)*log(e))*l
og(b*x + a)^2 + 18*((2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d + 18*B^3*a^2*b*c*d^2
)*n^3 + (11*B^3*b^3*d^3*n^3 + 6*A*B^2*b^3*d^3*n^2)*x^3 + 6*(A*B^2*b^3*c^3 -
 3*A*B^2*a*b^2*c^2*d + 3*A*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n^2
+ (2*B^3*b^3*c*d^2 + 9*B^3*a*b^2*d^3)*n^3)*x^2 + 3*(6*A*B^2*a^2*b*d^3*n^2 -
 (B^3*b^3*c^2*d - 6*B^3*a*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^3)*x + 6*(B^3*b^3*
d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*B^3*a^2*b*d^3*n^3*x + (B^3*b^3*c^
3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^3)*log(b*x + a) + 6*(B^3*b^3*d
^3*n^2*x^3 + 3*B^3*a*b^2*d^3*n^2*x^2 + 3*B^3*a^2*b*d^3*n^2*x + (B^3*b^3*c^3
 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^2)*log(e))*log(d*x + c)^2 + 18*
(6*A*B^2*b^3*c^3 - 18*A*B^2*a*b^2*c^2*d + 18*A*B^2*a^2*b*c*d^2 - 6*A*B^2*a^
3*d^3 + 6*(B^3*b^3*c*d^2 - B^3*a*b^2*d^3)*n*x^2 - 3*(B^3*b^3*c^2*d - 6*B^3*
a*b^2*c*d^2 + 5*B^3*a^2*b*d^3)*n*x + (2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d + 1
8*B^3*a^2*b*c*d^2 - 11*B^3*a^3*d^3)*n)*log(e)^2 + 18*(2*A^2*B*b^3*c^3 - 9*A
```

```
^2*B*a*b^2*c^2*d + 18*A^2*B*a^2*b*c*d^2 - 11*A^2*B*a^3*d^3)*n - 3*((19*B^3*
b^3*c^2*d - 378*B^3*a*b^2*c*d^2 + 359*B^3*a^2*b*d^3)*n^3 + 6*(5*A*B^2*b^3*c
^2*d - 54*A*B^2*a*b^2*c*d^2 + 49*A*B^2*a^2*b*d^3)*n^2 + 18*(A^2*B*b^3*c^2*d
 - 6*A^2*B*a*b^2*c*d^2 + 5*A^2*B*a^2*b*d^3)*n)*x + 6*((4*B^3*b^3*c^3 - 27*B
^3*a*b^2*c^2*d + 108*B^3*a^2*b*c*d^2)*n^3 + (85*B^3*b^3*d^3*n^3 + 66*A*B^2*
b^3*d^3*n^2 + 18*A^2*B*b^3*d^3*n)*x^3 + 6*(2*A*B^2*b^3*c^3 - 9*A*B^2*a*b^2*
c^2*d + 18*A*B^2*a^2*b*c*d^2)*n^2 + 3*(18*A^2*B*a*b^2*d^3*n + (22*B^3*b^3*c
*d^2 + 63*B^3*a*b^2*d^3)*n^3 + 6*(2*A*B^2*b^3*c*d^2 + 9*A*B^2*a*b^2*d^3)*n^
2)*x^2 + 18*(B^3*b^3*d^3*n*x^3 + 3*B^3*a*b^2*d^3*n*x^2 + 3*B^3*a^2*b*d^3*n*
x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n)*log(e)^2 + 18*
(A^2*B*b^3*c^3 - 3*A^2*B*a*b^2*c^2*d + 3*A^2*B*a^2*b*c*d^2)*n + 3*(18*A^2*B
*a^2*b*d^3*n - (5*B^3*b^3*c^2*d - 54*B^3*a*b^2*c*d^2 - 36*B^3*a^2*b*d^3)*n^
3 - 6*(A*B^2*b^3*c^2*d - 6*A*B^2*a*b^2*c*d^2 - 6*A*B^2*a^2*b*d^3)*n^2)*x +
6*((11*B^3*b^3*d^3*n^2 + 6*A*B^2*b^3*d^3*n)*x^3 + (2*B^3*b^3*c^3 - 9*B^3*a*
b^2*c^2*d + 18*B^3*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n + (2*B^3*b^3*c
*d^2 + 9*B^3*a*b^2*d^3)*n^2)*x^2 + 6*(A*B^2*b^3*c^3 - 3*A*B^2*a*b^2*c^2*d +
 3*A*B^2*a^2*b*c*d^2)*n + 3*(6*A*B^2*a^2*b*d^3*n - (B^3*b^3*c^2*d - 6*B^3*a
*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^2)*x)*log(e))*log(b*x + a) - 6*((4*B^3*b^3*
c^3 - 27*B^3*a*b^2*c^2*d + 108*B^3*a^2*b*c*d^2)*n^3 + (85*B^3*b^3*d^3*n^3 +
 66*A*B^2*b^3*d^3*n^2 + 18*A^2*B*b^3*d^3*n)*x^3 + 6*(2*A*B^2*b^3*c^3 - 9*A*
B^2*a*b^2*c^2*d + 18*A*B^2*a^2*b*c*d^2)*n^2 + 3*(18*A^2*B*a*b^2*d^3*n + (22
*B^3*b^3*c*d^2 + 63*B^3*a*b^2*d^3)*n^3 + 6*(2*A*B^2*b^3*c*d^2 + 9*A*B^2*a*b
^2*d^3)*n^2)*x^2 + 18*(B^3*b^3*d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*B^
3*a^2*b*d^3*n^3*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n
^3)*log(b*x + a)^2 + 18*(B^3*b^3*d^3*n*x^3 + 3*B^3*a*b^2*d^3*n*x^2 + 3*B^3*
a^2*b*d^3*n*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n)*lo
g(e)^2 + 18*(A^2*B*b^3*c^3 - 3*A^2*B*a*b^2*c^2*d + 3*A^2*B*a^2*b*c*d^2)*n +
 3*(18*A^2*B*a^2*b*d^3*n - (5*B^3*b^3*c^2*d - 54*B^3*a*b^2*c*d^2 - 36*B^3*a
^2*b*d^3)*n^3 - 6*(A*B^2*b^3*c^2*d - 6*A*B^2*a*b^2*c*d^2 - 6*A*B^2*a^2*b*d^
3)*n^2)*x + 6*((2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d + 18*B^3*a^2*b*c*d^2)*n^3
 + (11*B^3*b^3*d^3*n^3 + 6*A*B^2*b^3*d^3*n^2)*x^3 + 6*(A*B^2*b^3*c^3 - 3*A*
B^2*a*b^2*c^2*d + 3*A*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n^2 + (2*
B^3*b^3*c*d^2 + 9*B^3*a*b^2*d^3)*n^3)*x^2 + 3*(6*A*B^2*a^2*b*d^3*n^2 - (B^3
*b^3*c^2*d - 6*B^3*a*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^3)*x + 6*(B^3*b^3*d^3*n
^2*x^3 + 3*B^3*a*b^2*d^3*n^2*x^2 + 3*B^3*a^2*b*d^3*n^2*x + (B^3*b^3*c^3 - 3
*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^2)*log(e))*log(b*x + a) + 6*((11*B^
3*b^3*d^3*n^2 + 6*A*B^2*b^3*d^3*n)*x^3 + (2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d
 + 18*B^3*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n + (2*B^3*b^3*c*d^2 + 9*
B^3*a*b^2*d^3)*n^2)*x^2 + 6*(A*B^2*b^3*c^3 - 3*A*B^2*a*b^2*c^2*d + 3*A*B^2*
a^2*b*c*d^2)*n + 3*(6*A*B^2*a^2*b*d^3*n - (B^3*b^3*c^2*d - 6*B^3*a*b^2*c*d^
2 - 6*B^3*a^2*b*d^3)*n^2)*x)*log(e))*log(d*x + c) + 6*(18*A^2*B*b^3*c^3 - 5
4*A^2*B*a*b^2*c^2*d + 54*A^2*B*a^2*b*c*d^2 - 18*A^2*B*a^3*d^3 + (4*B^3*b^3*
c^3 - 27*B^3*a*b^2*c^2*d + 108*B^3*a^2*b*c*d^2 - 85*B^3*a^3*d^3)*n^2 + 6*(1
1*(B^3*b^3*c*d^2 - B^3*a*b^2*d^3)*n^2 + 6*(A*B^2*b^3*c*d^2 - A*B^2*a*b^2*d^
3)*n)*x^2 + 6*(2*A*B^2*b^3*c^3 - 9*A*B^2*a*b^2*c^2*d + 18*A*B^2*a^2*b*c*d^2
 - 11*A*B^2*a^3*d^3)*n - 3*((5*B^3*b^3*c^2*d - 54*B^3*a*b^2*c*d^2 + 49*B^3*
a^2*b*d^3)*n^2 + 6*(A*B^2*b^3*c^2*d - 6*A*B^2*a*b^2*c*d^2 + 5*A*B^2*a^2*b*d
^3)*n)*x)*log(e))/(a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*
d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*x^3 + 3*(a*
b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*x^2 + 3*(a^2*b^5
*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{(bx+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^4, x)
```

maple [C] time = 48.03, size = 175812, normalized size = 287.74

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x)
```

```
[Out] result too large to display
```

maxima [B] time = 4.17, size = 3630, normalized size = 5.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x, algorithm="maxi
ma")
```

```
[Out] -1/3*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^
2*x + a^3*b) - 1/108*(18*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d +
 3*a^2*b^2*c*d^2 - a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c
^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n -
7*a*b*c*d*e*n + 11*a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^
3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x
^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a
^3*b^3*c*d + a^4*b^2*d^2)*x))*log((b*x + a)^n*e/(d*x + c)^n)^2/e + (6*(4*b^
3*c^3*e^2*n^2 - 27*a*b^2*c^2*d*e^2*n^2 + 108*a^2*b*c*d^2*e^2*n^2 - 85*a^3*d
^3*e^2*n^2 + 66*(b^3*c*d^2*e^2*n^2 - a*b^2*d^3*e^2*n^2)*x^2 - 18*(b^3*d^3*e
^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*
n^2)*log(b*x + a)^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3
*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(d*x + c)^2 - 3*(5*b^3*c^2*d*e^2
*n^2 - 54*a*b^2*c*d^2*e^2*n^2 + 49*a^2*b*d^3*e^2*n^2)*x + 66*(b^3*d^3*e^2*n
^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)
*log(b*x + a) - 6*(11*b^3*d^3*e^2*n^2*x^3 + 33*a*b^2*d^3*e^2*n^2*x^2 + 33*a
^2*b*d^3*e^2*n^2*x + 11*a^3*d^3*e^2*n^2 - 6*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*
d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a))*lo
g(d*x + c))*log((b*x + a)^n*e/(d*x + c)^n)/((a^3*b^4*c^3 - 3*a^4*b^3*c^2*d
+ 3*a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2
- a^3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4
*b^3*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^
2*d^3)*x)*e) + (8*b^3*c^3*e^3*n^3 - 81*a*b^2*c^2*d*e^3*n^3 + 648*a^2*b*c*d^
2*e^3*n^3 - 575*a^3*d^3*e^3*n^3 + 36*(b^3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3
*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*e^3*n^3)*log(b*x + a)^3 - 36*(b^
3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d
^3*e^3*n^3)*log(d*x + c)^3 + 510*(b^3*c*d^2*e^3*n^3 - a*b^2*d^3*e^3*n^3)*x^
2 - 198*(b^3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^
3*x + a^3*d^3*e^3*n^3)*log(b*x + a)^2 - 18*(11*b^3*d^3*e^3*n^3*x^3 + 33*a*b
^2*d^3*e^3*n^3*x^2 + 33*a^2*b*d^3*e^3*n^3*x + 11*a^3*d^3*e^3*n^3 - 6*(b^3*d
^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*
e^3*n^3)*log(b*x + a))*log(d*x + c)^2 - 3*(19*b^3*c^2*d*e^3*n^3 - 378*a*b^2
*c*d^2*e^3*n^3 + 359*a^2*b*d^3*e^3*n^3)*x + 510*(b^3*d^3*e^3*n^3*x^3 + 3*a*
b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*e^3*n^3)*log(b*x + a)
 - 6*(85*b^3*d^3*e^3*n^3*x^3 + 255*a*b^2*d^3*e^3*n^3*x^2 + 255*a^2*b*d^3*e^
3*n^3*x + 85*a^3*d^3*e^3*n^3 + 18*(b^3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^
3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*e^3*n^3)*log(b*x + a)^2 - 66*(b^3*d
^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*
```

```
e^3*n^3)*log(b*x + a))*log(d*x + c))/((a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^
5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*
b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d
^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)
*x)*e^2))/e)*B^3 - 1/18*A*B^2*(6*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3
*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3
*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^
2*e*n - 7*a*b*c*d*e*n + 11*a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)
/(a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^
4*d^2)*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c
^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e + (4
*b^3*c^3*e^2*n^2 - 27*a*b^2*c^2*d*e^2*n^2 + 108*a^2*b*c*d^2*e^2*n^2 - 85*a^
3*d^3*e^2*n^2 + 66*(b^3*c*d^2*e^2*n^2 - a*b^2*d^3*e^2*n^2)*x^2 - 18*(b^3*d^
3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e
^2*n^2)*log(b*x + a)^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2
+ 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(d*x + c)^2 - 3*(5*b^3*c^2*d*
e^2*n^2 - 54*a*b^2*c*d^2*e^2*n^2 + 49*a^2*b*d^3*e^2*n^2)*x + 66*(b^3*d^3*e^
2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n
^2)*log(b*x + a) - 6*(11*b^3*d^3*e^2*n^2*x^3 + 33*a*b^2*d^3*e^2*n^2*x^2 + 3
3*a^2*b*d^3*e^2*n^2*x + 11*a^3*d^3*e^2*n^2 - 6*(b^3*d^3*e^2*n^2*x^3 + 3*a*b
^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a))
*log(d*x + c))/((a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^
3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*x^3 + 3*(a*b^
6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*x^2 + 3*(a^2*b^5*c
^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*x)*e^2)) - A*B^2*log(
(b*x + a)^n*e/(d*x + c)^n)^2/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*b)
- 1/6*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*n + 11*
a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^4*b^2*c
*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^5*c^2 -
 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^
2*d^2)*x))*A^2*B/e - A^2*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^4*x^3 + 3*a*b^
3*x^2 + 3*a^2*b^2*x + a^3*b) - 1/3*A^3/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x
 + a^3*b)
```

mupad [B] time = 10.73, size = 2069, normalized size = 3.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(a + b*x)^4,x)
```

```
[Out] ((36*A^3*a^2*d^2 + 36*A^3*b^2*c^2 + 575*B^3*a^2*d^2*n^3 + 8*B^3*b^2*c^2*n^3
 + 198*A^2*B*a^2*d^2*n + 36*A^2*B*b^2*c^2*n - 72*A^3*a*b*c*d + 510*A*B^2*a^
2*d^2*n^2 + 24*A*B^2*b^2*c^2*n^2 - 73*B^3*a*b*c*d*n^3 - 126*A^2*B*a*b*c*d*n
 - 138*A*B^2*a*b*c*d*n^2)/(6*(a*d - b*c)) + (x*(359*B^3*a*b*d^2*n^3 - 19*B^
3*b^2*c*d*n^3 + 90*A^2*B*a*b*d^2*n - 18*A^2*B*b^2*c*d*n + 294*A*B^2*a*b*d^2
*n^2 - 30*A*B^2*b^2*c*d*n^2))/(2*(a*d - b*c)) + (x^2*(85*B^3*b^2*d^2*n^3 +
18*A^2*B*b^2*d^2*n + 66*A*B^2*b^2*d^2*n^2))/(a*d - b*c))/(x^3*(18*b^5*c - 1
8*a*b^4*d) + x*(54*a^2*b^3*c - 54*a^3*b^2*d) - x^2*(54*a^2*b^3*d - 54*a*b^4
*c) + 18*a^3*b^2*c - 18*a^4*b*d) - log((e*(a + b*x)^n)/(c + d*x)^n)^3*(B^3/
(3*b*(a^3 + b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x)) - (B^3*d^3)/(3*b*(a^3*d^3 -
 b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - log((e*(a + b*x)^n)/(c + d*x)
^n)^2*((A*B^2)/(a^3*b + b^4*x^3 + 3*a^2*b^2*x + 3*a*b^3*x^2) - (d^3*(6*A*B^
2 + 11*B^3*n))/(6*b*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) +
(B^3*d^3*(a*((b*n*(a*d - b*c)*(3*a*d - b*c))/(6*d^2) + (a*b*n*(a*d - b*c))/
(3*d)) + x*(b*((b*n*(a*d - b*c)*(3*a*d - b*c))/(6*d^2) + (a*b*n*(a*d - b*c)
)/(3*d)) + (2*a*b^2*n*(a*d - b*c))/(3*d) + (b^2*n*(a*d - b*c)*(3*a*d - b*c)
)/(3*d^2)) + (b*n*(a*d - b*c)*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d))/(3*d^3) +
```

```
(b^3*n*x^2*(a*d - b*c))/d))/(b*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b
*c*d^2)*(a^3*b + b^4*x^3 + 3*a^2*b^2*x + 3*a*b^3*x^2))) - log((e*(a + b*x)^
n)/(c + d*x)^n)*((x*((a*d + b*c)*(3*A^2*B*a*d - 3*A^2*B*b*c - 6*B^3*a*d*n^2
 + 3*B^3*b*c*n^2) - 3*B^3*a*b*c*d*n^2) + x^2*(b*d*(3*A^2*B*a*d - 3*A^2*B*b*
c - 6*B^3*a*d*n^2 + 3*B^3*b*c*n^2) - 3*B^3*b*d*n^2*(a*d + b*c)) + a*c*(3*A^
2*B*a*d - 3*A^2*B*b*c - 6*B^3*a*d*n^2 + 3*B^3*b*c*n^2) - 3*B^3*b^2*d^2*n^2*
x^3)/(3*b*(a*d - b*c)*(a + b*x)^4*(c + d*x)) + (d^3*(6*A*B^2 + 11*B^3*n)*(x
*((a*((a*b*n*(a*d - b*c)^2)/d + (b*n*(a*d - b*c)^2*(3*a*d - b*c))/(2*d^2))
+ (b*n*(a*d - b*c)^2*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d))/d^3)*(a*d + b*c) +
a*c*(b*((a*b*n*(a*d - b*c)^2)/d + (b*n*(a*d - b*c)^2*(3*a*d - b*c))/(2*d^2)
) + (b^2*n*(a*d - b*c)^2*(3*a*d - b*c))/d^2 + (2*a*b^2*n*(a*d - b*c)^2)/d))
 + x^2*((a*d + b*c)*(b*((a*b*n*(a*d - b*c)^2)/d + (b*n*(a*d - b*c)^2*(3*a*d
 - b*c))/(2*d^2)) + (b^2*n*(a*d - b*c)^2*(3*a*d - b*c))/d^2 + (2*a*b^2*n*(a
*d - b*c)^2)/d) + b*d*(a*((a*b*n*(a*d - b*c)^2)/d + (b*n*(a*d - b*c)^2*(3*a
*d - b*c))/(2*d^2)) + (b*n*(a*d - b*c)^2*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d))
/d^3) + (3*a*b^3*c*n*(a*d - b*c)^2)/d) + x^3*(b*d*(b*((a*b*n*(a*d - b*c)^2)
/d + (b*n*(a*d - b*c)^2*(3*a*d - b*c))/(2*d^2)) + (b^2*n*(a*d - b*c)^2*(3*a
*d - b*c))/d^2 + (2*a*b^2*n*(a*d - b*c)^2)/d) + (3*b^3*n*(a*d + b*c)*(a*d -
 b*c)^2)/d) + a*c*(a*((a*b*n*(a*d - b*c)^2)/d + (b*n*(a*d - b*c)^2*(3*a*d -
 b*c))/(2*d^2)) + (b*n*(a*d - b*c)^2*(3*a^2*d^2 + b^2*c^2 - 3*a*b*c*d))/d^3
) + 3*b^4*n*x^4*(a*d - b*c)^2))/(9*b^2*(a*d - b*c)*(a + b*x)^4*(c + d*x)*(a
^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (B*d^3*n*atan((B*d^3*
n*((b^4*c^3 + a^3*b*d^3 - a^2*b^2*c*d^2 - a*b^3*c^2*d)/(b^3*c^2 + a^2*b*d^2
 - 2*a*b^2*c*d) + 2*b*d*x)*(18*A^2 + 85*B^2*n^2 + 66*A*B*n)*(b^3*c^2 + a^2*
b*d^2 - 2*a*b^2*c*d)*1i)/(b*(a*d - b*c)^3*(85*B^3*d^3*n^3 + 18*A^2*B*d^3*n
+ 66*A*B^2*d^3*n^2)))*(18*A^2 + 85*B^2*n^2 + 66*A*B*n)*1i)/(9*b*(a*d - b*c)
^3)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**4,x)
```

```
[Out] Timed out
```

3.171 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{(a+bx)^5}\,dx$

Optimal. Leaf size=830

$$-\frac{b^3\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3(c+dx)^4}{4(bc-ad)^4(a+bx)^4}-\frac{3b^3Bn\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2(c+dx)^4}{16(bc-ad)^4(a+bx)^4}-\frac{3b^3B^2n^2}{}$$

```
[Out] 6*B^3*d^3*n^3*(d*x+c)/(-a*d+b*c)^4/(b*x+a)-9/8*b*B^3*d^2*n^3*(d*x+c)^2/(-a*
d+b*c)^4/(b*x+a)^2+2/9*b^2*B^3*d*n^3*(d*x+c)^3/(-a*d+b*c)^4/(b*x+a)^3-3/128
*b^3*B^3*n^3*(d*x+c)^4/(-a*d+b*c)^4/(b*x+a)^4+6*B^2*d^3*n^2*(d*x+c)*(A+B*ln
(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)-9/4*b*B^2*d^2*n^2*(d*x+c)^2
*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)^2+2/3*b^2*B^2*d*n^2
*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)^3-3/32*b^
3*B^2*n^2*(d*x+c)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*d+b*c)^4/(b*x+a)^
4+3*B*d^3*n*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^4/(b*x+a
)-9/4*b*B*d^2*n*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c)^4/
(b*x+a)^2+b^2*B*d*n*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*d+b*c
)^4/(b*x+a)^3-3/16*b^3*B*n*(d*x+c)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-
a*d+b*c)^4/(b*x+a)^4+d^3*(d*x+c)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*d+
b*c)^4/(b*x+a)-3/2*b*d^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*
d+b*c)^4/(b*x+a)^2+b^2*d*(d*x+c)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*
d+b*c)^4/(b*x+a)^3-1/4*b^3*(d*x+c)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-
a*d+b*c)^4/(b*x+a)^4
```

Rubi [C] time = 4.67, antiderivative size = 2173, normalized size of antiderivative = 2.62, number of steps used = 93, number of rules used = 16, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.485, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315, 2491, 2509, 37, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^5,x]
```

```
[Out] -A^3/(4*b*(a + b*x)^4) - (3*A^2*B*n)/(16*b*(a + b*x)^4) - (3*A*B^2*n^2)/(32
*b*(a + b*x)^4) - (3*B^3*n^3)/(128*b*(a + b*x)^4) + (A^2*B*d*n)/(4*b*(b*c -
 a*d)*(a + b*x)^3) + (7*A*B^2*d*n^2)/(24*b*(b*c - a*d)*(a + b*x)^3) + (37*B
^3*d*n^3)/(288*b*(b*c - a*d)*(a + b*x)^3) - (3*A^2*B*d^2*n)/(8*b*(b*c - a*d
)^2*(a + b*x)^2) - (13*A*B^2*d^2*n^2)/(16*b*(b*c - a*d)^2*(a + b*x)^2) - (7
9*B^3*d^2*n^3)/(192*b*(b*c - a*d)^2*(a + b*x)^2) + (3*A^2*B*d^3*n)/(4*b*(b*
c - a*d)^3*(a + b*x)) + (25*A*B^2*d^3*n^2)/(8*b*(b*c - a*d)^3*(a + b*x)) +
(451*B^3*d^3*n^3)/(96*b*(b*c - a*d)^3*(a + b*x)) - (3*b*B^3*d^2*n^3*(c + d*
x)^2)/(16*(b*c - a*d)^4*(a + b*x)^2) + (3*A^2*B*d^4*n*Log[a + b*x])/(4*b*(b
*c - a*d)^4) + (13*A*B^2*d^4*n^2*Log[a + b*x])/(8*b*(b*c - a*d)^4) + (79*B^
3*d^4*n^3*Log[a + b*x])/(96*b*(b*c - a*d)^4) - (3*A^2*B*d^4*n*Log[c + d*x])
/(4*b*(b*c - a*d)^4) - (13*A*B^2*d^4*n^2*Log[c + d*x])/(8*b*(b*c - a*d)^4)
- (79*B^3*d^4*n^3*Log[c + d*x])/(96*b*(b*c - a*d)^4) - (3*A^2*B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])/(4*b*(a + b*x)^4) - (3*A*B^2*n*Log[(e*(a + b*x)^n)/(
c + d*x)^n])/(8*b*(a + b*x)^4) - (3*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n
])/(32*b*(a + b*x)^4) + (A*B^2*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(
b*c - a*d)*(a + b*x)^3) + (7*B^3*d*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2
4*b*(b*c - a*d)*(a + b*x)^3) - (3*A*B^2*d^2*n*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(4*b*(b*c - a*d)^2*(a + b*x)^2) - (7*B^3*d^2*n^2*Log[(e*(a + b*x)^n)/(
c + d*x)^n])/(16*b*(b*c - a*d)^2*(a + b*x)^2) + (3*A*B^2*d^3*n*(c + d*x)*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n])/(2*(b*c - a*d)^4*(a + b*x)) + (31*B^3*d^3*n
^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*(b*c - a*d)^4*(a + b*x))
- (3*b*B^3*d^2*n^2*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*(b*c -
```

```
a*d)^4*(a + b*x)^2) - (3*A*B^2*d^4*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[
(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) - (7*B^3*d^4*n^2*Log[-((b
*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(b*c - a*d
)^4) + (3*A*B^2*d^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/(2*b*(b*c - a*d)^4) + (7*B^3*d^4*n^2*Log[(b*c - a*d)/(b*(c + d*
x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(b*c - a*d)^4) - (3*A*B^2*Log[(
e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(a + b*x)^4) - (3*B^3*n*Log[(e*(a + b*x
)^n)/(c + d*x)^n]^2)/(16*b*(a + b*x)^4) + (B^3*d*n*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]^2)/(4*b*(b*c - a*d)*(a + b*x)^3) + (3*B^3*d^3*n*(c + d*x)*Log[(e*(
a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*c - a*d)^4*(a + b*x)) - (3*b*B^3*d^2*n*(c
 + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(8*(b*c - a*d)^4*(a + b*x)^2)
 - (3*B^3*d^4*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2)/(4*b*(b*c - a*d)^4) + (3*B^3*d^4*n*Log[(b*c - a*d)/(b*(c + d*x))
]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(b*c - a*d)^4) - (B^3*Log[(e*(a
+ b*x)^n)/(c + d*x)^n]^3)/(4*b*(a + b*x)^4) + (3*A*B^2*d^4*n^2*PolyLog[2, (
d*(a + b*x))/(b*(c + d*x))])/(2*b*(b*c - a*d)^4) + (7*B^3*d^4*n^3*PolyLog[2
, (d*(a + b*x))/(b*(c + d*x))])/(8*b*(b*c - a*d)^4) + (3*A*B^2*d^4*n^2*Poly
Log[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(2*b*(b*c - a*d)^4) + (7*B^3*d^4*n^3
*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(8*b*(b*c - a*d)^4) + (3*B^3*d^
4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b
*x))])/(2*b*(b*c - a*d)^4) + (3*B^3*d^4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n
]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*(b*c - a*d)^4) + (3*B^3*d
^4*n^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(2*b*(b*c - a*d)^4) - (3*
B^3*d^4*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*(b*c - a*d)^4)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(a+bx)^5}\,dx = \int\left(\frac{A^3}{(a+bx)^5}+\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}+\frac{3AB^2\log^2(e(a+}{(a+}\right.$$

$$= -\frac{A^3}{4b(a+bx)^4}+\left(3A^2B\right)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\,dx+\left(3AB^2\right)$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b(a+bx)^4}-\frac{3AB^2\log^2(e(a+}{4b(a+}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b(a+bx)^4}-\frac{3AB^2\log^2(e(a+}{4b(a+}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}+\frac{A^2Bdn}{4b(bc-ad)(a+bx)^3}-\frac{3A^2B}{8b(bc-ad)^2}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}+\frac{A^2Bdn}{4b(bc-ad)(a+bx)^3}-\frac{3A^2B}{8b(bc-ad)^2}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}+\frac{A^2Bdn}{4b(bc-ad)(a+bx)^3}-\frac{3A^2B}{8b(bc-ad)^2}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}-\frac{3AB^2n^2}{32b(a+bx)^4}+\frac{A^2Bdn}{4b(bc-ad)(a+bx)^3}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}-\frac{3AB^2n^2}{32b(a+bx)^4}+\frac{A^2Bdn}{4b(bc-ad)(a+bx)^3}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}-\frac{3AB^2n^2}{32b(a+bx)^4}+\frac{A^2Bdn}{4b(bc-ad)(a+bx)^3}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}-\frac{3AB^2n^2}{32b(a+bx)^4}-\frac{3B^3n^3}{128b(a+bx)^4}+\frac{}{4b(}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}-\frac{3AB^2n^2}{32b(a+bx)^4}-\frac{3B^3n^3}{128b(a+bx)^4}+\frac{}{4b(}$$

$$= -\frac{A^3}{4b(a+bx)^4}-\frac{3A^2Bn}{16b(a+bx)^4}-\frac{3AB^2n^2}{32b(a+bx)^4}-\frac{3B^3n^3}{128b(a+bx)^4}+\frac{}{4b(}$$

Mathematica [A] time = 2.22, size = 1370, normalized size = 1.65

$$-\frac{-288B^3d^4n^3\log^3(a+bx)(a+bx)^4+288B^3d^4n^3\log^3(c+dx)(a+bx)^4+72B^2d^4n^2\log^2(c+dx)\left(12A+25Bn+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^5,x]
```

```
[Out] -1/1152*(-288*B^3*d^4*n^3*(a + b*x)^4*Log[a + b*x]^3 + 288*B^3*d^4*n^3*(a +
 b*x)^4*Log[c + d*x]^3 + 72*B^2*d^4*n^2*(a + b*x)^4*Log[c + d*x]^2*(12*A +
```

```
25*B*n + 12*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 72*B^2*d^4*n^2*(a + b*x)^
4*Log[a + b*x]^2*(12*A + 25*B*n + 12*B*n*Log[c + d*x] + 12*B*Log[(e*(a + b*
x)^n)/(c + d*x)^n]) + 12*B*d^4*n*(a + b*x)^4*Log[c + d*x]*(72*A^2 + 300*A*B
*n + 415*B^2*n^2 + 12*B*(12*A + 25*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] +
72*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2) + (b*c - a*d)*(288*A^3*b^3*c^3 -
 864*a*A^3*b^2*c^2*d + 864*a^2*A^3*b*c*d^2 - 288*a^3*A^3*d^3 + 216*A^2*b^3*
B*c^3*n - 936*a*A^2*b^2*B*c^2*d*n + 1656*a^2*A^2*b*B*c*d^2*n - 1800*a^3*A^2
*B*d^3*n + 108*A*b^3*B^2*c^3*n^2 - 660*a*A*b^2*B^2*c^2*d*n^2 + 1932*a^2*A*b
*B^2*c*d^2*n^2 - 4980*a^3*A*B^2*d^3*n^2 + 27*b^3*B^3*c^3*n^3 - 229*a*b^2*B^
3*c^2*d*n^3 + 1067*a^2*b*B^3*c*d^2*n^3 - 5845*a^3*B^3*d^3*n^3 - 288*A^2*b^3
*B*c^2*d*n*x + 1440*a*A^2*b^2*B*c*d^2*n*x - 3744*a^2*A^2*b*B*d^3*n*x - 336*
A*b^3*B^2*c^2*d*n^2*x + 2544*a*A*b^2*B^2*c*d^2*n^2*x - 13008*a^2*A*b*B^2*d^
3*n^2*x - 148*b^3*B^3*c^2*d*n^3*x + 1676*a*b^2*B^3*c*d^2*n^3*x - 16468*a^2*
b*B^3*d^3*n^3*x + 432*A^2*b^3*B*c*d^2*n*x^2 - 3024*a*A^2*b^2*B*d^3*n*x^2 +
936*A*b^3*B^2*c*d^2*n^2*x^2 - 11736*a*A*b^2*B^2*d^3*n^2*x^2 + 690*b^3*B^3*c
*d^2*n^3*x^2 - 15630*a*b^2*B^3*d^3*n^3*x^2 - 864*A^2*b^3*B*d^3*n*x^3 - 3600
*A*b^3*B^2*d^3*n^2*x^3 - 4980*b^3*B^3*d^3*n^3*x^3 + 12*B*(72*A^2*(b*c - a*d
)^3 + B^2*n^2*(-415*a^3*d^3 + a^2*b*d^2*(161*c - 1084*d*x) + a*b^2*d*(-55*c
^2 + 212*c*d*x - 978*d^2*x^2) + b^3*(9*c^3 - 28*c^2*d*x + 78*c*d^2*x^2 - 30
0*d^3*x^3)) + 12*A*B*n*(-25*a^3*d^3 + a^2*b*d^2*(23*c - 52*d*x) + a*b^2*d*(
-13*c^2 + 20*c*d*x - 42*d^2*x^2) + b^3*(3*c^3 - 4*c^2*d*x + 6*c*d^2*x^2 - 1
2*d^3*x^3)))*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 72*B^2*(12*A*(b*c - a*d)^3
+ B*n*(-25*a^3*d^3 + a^2*b*d^2*(23*c - 52*d*x) + a*b^2*d*(-13*c^2 + 20*c*d*
x - 42*d^2*x^2) + b^3*(3*c^3 - 4*c^2*d*x + 6*c*d^2*x^2 - 12*d^3*x^3)))*Log[
(e*(a + b*x)^n)/(c + d*x)^n]^2 + 288*B^3*(b*c - a*d)^3*Log[(e*(a + b*x)^n)/
(c + d*x)^n]^3) - 12*B*d^4*n*(a + b*x)^4*Log[a + b*x]*(72*A^2 + 300*A*B*n +
 415*B^2*n^2 + 72*B^2*n^2*Log[c + d*x]^2 + 12*B*(12*A + 25*B*n)*Log[(e*(a +
 b*x)^n)/(c + d*x)^n] + 72*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 12*B*n*
Log[c + d*x]*(12*A + 25*B*n + 12*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))/(b*(
b*c - a*d)^4*(a + b*x)^4)
```

fricas [B] time = 1.62, size = 6057, normalized size = 7.30

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x, algorithm="fric
as")
```

```
[Out] -1/1152*(288*A^3*b^4*c^4 - 1152*A^3*a*b^3*c^3*d + 1728*A^3*a^2*b^2*c^2*d^2
- 1152*A^3*a^3*b*c*d^3 + 288*A^3*a^4*d^4 + (27*B^3*b^4*c^4 - 256*B^3*a*b^3*
c^3*d + 1296*B^3*a^2*b^2*c^2*d^2 - 6912*B^3*a^3*b*c*d^3 + 5845*B^3*a^4*d^4)
*n^3 - 12*(415*(B^3*b^4*c*d^3 - B^3*a*b^3*d^4)*n^3 + 300*(A*B^2*b^4*c*d^3 -
 A*B^2*a*b^3*d^4)*n^2 + 72*(A^2*B*b^4*c*d^3 - A^2*B*a*b^3*d^4)*n)*x^3 - 288
*(B^3*b^4*d^4*n^3*x^4 + 4*B^3*a*b^3*d^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2
 + 4*B^3*a^3*b*d^4*n^3*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2
*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n^3)*log(b*x + a)^3 + 288*(B^3*b^4*d^4*n^3*x^
4 + 4*B^3*a*b^3*d^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2 + 4*B^3*a^3*b*d^4*n
^3*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3
*b*c*d^3)*n^3)*log(d*x + c)^3 + 288*(B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^
3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3 + B^3*a^4*d^4)*log(e)^3 + 12*(9*A*B^2
*b^4*c^4 - 64*A*B^2*a*b^3*c^3*d + 216*A*B^2*a^2*b^2*c^2*d^2 - 576*A*B^2*a^3
*b*c*d^3 + 415*A*B^2*a^4*d^4)*n^2 + 6*(5*(23*B^3*b^4*c^2*d^2 - 544*B^3*a*b^
3*c*d^3 + 521*B^3*a^2*b^2*d^4)*n^3 + 12*(13*A*B^2*b^4*c^2*d^2 - 176*A*B^2*a
*b^3*c*d^3 + 163*A*B^2*a^2*b^2*d^4)*n^2 + 72*(A^2*B*b^4*c^2*d^2 - 8*A^2*B*a
*b^3*c*d^3 + 7*A^2*B*a^2*b^2*d^4)*n)*x^2 - 72*((25*B^3*b^4*d^4*n^3 + 12*A*B
^2*b^4*d^4*n^2)*x^4 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*
c^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^3 + 4*(12*A*B^2*a*b^3*d^4*n^2 + (3*B^3*b^4*
c*d^3 + 22*B^3*a*b^3*d^4)*n^3)*x^3 - 12*(A*B^2*b^4*c^4 - 4*A*B^2*a*b^3*c^3*
d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^
```

```
2*d^4*n^2 - (B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^3)
*x^2 + 4*(12*A*B^2*a^3*b*d^4*n^2 + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 1
8*B^3*a^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^3)*x + 12*(B^3*b^4*d^4*n^2*x^4 +
4*B^3*a*b^3*d^4*n^2*x^3 + 6*B^3*a^2*b^2*d^4*n^2*x^2 + 4*B^3*a^3*b*d^4*n^2*x
 - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c
*d^3)*n^2)*log(e))*log(b*x + a)^2 - 72*((25*B^3*b^4*d^4*n^3 + 12*A*B^2*b^4*
d^4*n^2)*x^4 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*c^2*d^2
 - 48*B^3*a^3*b*c*d^3)*n^3 + 4*(12*A*B^2*a*b^3*d^4*n^2 + (3*B^3*b^4*c*d^3 +
 22*B^3*a*b^3*d^4)*n^3)*x^3 - 12*(A*B^2*b^4*c^4 - 4*A*B^2*a*b^3*c^3*d + 6*A
*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^2*d^4*n
^2 - (B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^3)*x^2 +
4*(12*A*B^2*a^3*b*d^4*n^2 + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 18*B^3*a
^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^3)*x + 12*(B^3*b^4*d^4*n^3*x^4 + 4*B^3*a
*b^3*d^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2 + 4*B^3*a^3*b*d^4*n^3*x - (B^3
*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n
^3)*log(b*x + a) + 12*(B^3*b^4*d^4*n^2*x^4 + 4*B^3*a*b^3*d^4*n^2*x^3 + 6*B^
3*a^2*b^2*d^4*n^2*x^2 + 4*B^3*a^3*b*d^4*n^2*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*
c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n^2)*log(e))*log(d*x + c
)^2 + 72*(12*A*B^2*b^4*c^4 - 48*A*B^2*a*b^3*c^3*d + 72*A*B^2*a^2*b^2*c^2*d^
2 - 48*A*B^2*a^3*b*c*d^3 + 12*A*B^2*a^4*d^4 - 12*(B^3*b^4*c*d^3 - B^3*a*b^3
*d^4)*n*x^3 + 6*(B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 + 7*B^3*a^2*b^2*d^4)*n
*x^2 - 4*(B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 18*B^3*a^2*b^2*c*d^3 - 13*B
^3*a^3*b*d^4)*n*x + (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*c^
2*d^2 - 48*B^3*a^3*b*c*d^3 + 25*B^3*a^4*d^4)*n)*log(e)^2 + 72*(3*A^2*B*b^4*
c^4 - 16*A^2*B*a*b^3*c^3*d + 36*A^2*B*a^2*b^2*c^2*d^2 - 48*A^2*B*a^3*b*c*d^
3 + 25*A^2*B*a^4*d^4)*n - 4*((37*B^3*b^4*c^3*d - 456*B^3*a*b^3*c^2*d^2 + 45
36*B^3*a^2*b^2*c*d^3 - 4117*B^3*a^3*b*d^4)*n^3 + 12*(7*A*B^2*b^4*c^3*d - 60
*A*B^2*a*b^3*c^2*d^2 + 324*A*B^2*a^2*b^2*c*d^3 - 271*A*B^2*a^3*b*d^4)*n^2 +
 72*(A^2*B*b^4*c^3*d - 6*A^2*B*a*b^3*c^2*d^2 + 18*A^2*B*a^2*b^2*c*d^3 - 13*
A^2*B*a^3*b*d^4)*n)*x - 12*((415*B^3*b^4*d^4*n^3 + 300*A*B^2*b^4*d^4*n^2 +
72*A^2*B*b^4*d^4*n)*x^4 - (9*B^3*b^4*c^4 - 64*B^3*a*b^3*c^3*d + 216*B^3*a^2
*b^2*c^2*d^2 - 576*B^3*a^3*b*c*d^3)*n^3 + 4*(72*A^2*B*a*b^3*d^4*n + 5*(15*B
^3*b^4*c*d^3 + 68*B^3*a*b^3*d^4)*n^3 + 12*(3*A*B^2*b^4*c*d^3 + 22*A*B^2*a*b
^3*d^4)*n^2)*x^3 - 12*(3*A*B^2*b^4*c^4 - 16*A*B^2*a*b^3*c^3*d + 36*A*B^2*a^
2*b^2*c^2*d^2 - 48*A*B^2*a^3*b*c*d^3)*n^2 + 6*(72*A^2*B*a^2*b^2*d^4*n - (13
*B^3*b^4*c^2*d^2 - 176*B^3*a*b^3*c*d^3 - 252*B^3*a^2*b^2*d^4)*n^3 - 12*(A*B
^2*b^4*c^2*d^2 - 8*A*B^2*a*b^3*c*d^3 - 18*A*B^2*a^2*b^2*d^4)*n^2)*x^2 + 72*
(B^3*b^4*d^4*n*x^4 + 4*B^3*a*b^3*d^4*n*x^3 + 6*B^3*a^2*b^2*d^4*n*x^2 + 4*B^
3*a^3*b*d^4*n*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2
- 4*B^3*a^3*b*c*d^3)*n)*log(e)^2 - 72*(A^2*B*b^4*c^4 - 4*A^2*B*a*b^3*c^3*d
+ 6*A^2*B*a^2*b^2*c^2*d^2 - 4*A^2*B*a^3*b*c*d^3)*n + 4*(72*A^2*B*a^3*b*d^4*
n + (7*B^3*b^4*c^3*d - 60*B^3*a*b^3*c^2*d^2 + 324*B^3*a^2*b^2*c*d^3 + 144*B
^3*a^3*b*d^4)*n^3 + 12*(A*B^2*b^4*c^3*d - 6*A*B^2*a*b^3*c^2*d^2 + 18*A*B^2*
a^2*b^2*c*d^3 + 12*A*B^2*a^3*b*d^4)*n^2)*x + 12*((25*B^3*b^4*d^4*n^2 + 12*A
*B^2*b^4*d^4*n)*x^4 + 4*(12*A*B^2*a*b^3*d^4*n + (3*B^3*b^4*c*d^3 + 22*B^3*a
*b^3*d^4)*n^2)*x^3 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*c
^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^2*d^4*n - (B^3*b^4*c^2
*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B^2*b^4*c^4
 - 4*A*B^2*a*b^3*c^3*d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n +
 4*(12*A*B^2*a^3*b*d^4*n + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 18*B^3*a^
2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^2)*x)*log(e))*log(b*x + a) + 12*((415*B^3
*b^4*d^4*n^3 + 300*A*B^2*b^4*d^4*n^2 + 72*A^2*B*b^4*d^4*n)*x^4 - (9*B^3*b^4
*c^4 - 64*B^3*a*b^3*c^3*d + 216*B^3*a^2*b^2*c^2*d^2 - 576*B^3*a^3*b*c*d^3)*
n^3 + 4*(72*A^2*B*a*b^3*d^4*n + 5*(15*B^3*b^4*c*d^3 + 68*B^3*a*b^3*d^4)*n^3
 + 12*(3*A*B^2*b^4*c*d^3 + 22*A*B^2*a*b^3*d^4)*n^2)*x^3 - 12*(3*A*B^2*b^4*c
^4 - 16*A*B^2*a*b^3*c^3*d + 36*A*B^2*a^2*b^2*c^2*d^2 - 48*A*B^2*a^3*b*c*d^3
)*n^2 + 6*(72*A^2*B*a^2*b^2*d^4*n - (13*B^3*b^4*c^2*d^2 - 176*B^3*a*b^3*c*d
^3 - 252*B^3*a^2*b^2*d^4)*n^3 - 12*(A*B^2*b^4*c^2*d^2 - 8*A*B^2*a*b^3*c*d^3
 - 18*A*B^2*a^2*b^2*d^4)*n^2)*x^2 + 72*(B^3*b^4*d^4*n^3*x^4 + 4*B^3*a*b^3*d
```

```
^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2 + 4*B^3*a^3*b*d^4*n^3*x - (B^3*b^4*c
^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n^3)*lo
g(b*x + a)^2 + 72*(B^3*b^4*d^4*n*x^4 + 4*B^3*a*b^3*d^4*n*x^3 + 6*B^3*a^2*b^
2*d^4*n*x^2 + 4*B^3*a^3*b*d^4*n*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^
3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n)*log(e)^2 - 72*(A^2*B*b^4*c^4 - 4*
A^2*B*a*b^3*c^3*d + 6*A^2*B*a^2*b^2*c^2*d^2 - 4*A^2*B*a^3*b*c*d^3)*n + 4*(7
2*A^2*B*a^3*b*d^4*n + (7*B^3*b^4*c^3*d - 60*B^3*a*b^3*c^2*d^2 + 324*B^3*a^2
*b^2*c*d^3 + 144*B^3*a^3*b*d^4)*n^3 + 12*(A*B^2*b^4*c^3*d - 6*A*B^2*a*b^3*c
^2*d^2 + 18*A*B^2*a^2*b^2*c*d^3 + 12*A*B^2*a^3*b*d^4)*n^2)*x + 12*((25*B^3*
b^4*d^4*n^3 + 12*A*B^2*b^4*d^4*n^2)*x^4 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3
*d + 36*B^3*a^2*b^2*c^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^3 + 4*(12*A*B^2*a*b^3*d
^4*n^2 + (3*B^3*b^4*c*d^3 + 22*B^3*a*b^3*d^4)*n^3)*x^3 - 12*(A*B^2*b^4*c^4
- 4*A*B^2*a*b^3*c^3*d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n^2
+ 6*(12*A*B^2*a^2*b^2*d^4*n^2 - (B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B
^3*a^2*b^2*d^4)*n^3)*x^2 + 4*(12*A*B^2*a^3*b*d^4*n^2 + (B^3*b^4*c^3*d - 6*B
^3*a*b^3*c^2*d^2 + 18*B^3*a^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^3)*x + 12*(B^
3*b^4*d^4*n^2*x^4 + 4*B^3*a*b^3*d^4*n^2*x^3 + 6*B^3*a^2*b^2*d^4*n^2*x^2 + 4
*B^3*a^3*b*d^4*n^2*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2
*d^2 - 4*B^3*a^3*b*c*d^3)*n^2)*log(e))*log(b*x + a) + 12*((25*B^3*b^4*d^4*n
^2 + 12*A*B^2*b^4*d^4*n)*x^4 + 4*(12*A*B^2*a*b^3*d^4*n + (3*B^3*b^4*c*d^3 +
 22*B^3*a*b^3*d^4)*n^2)*x^3 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*
a^2*b^2*c^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^2*d^4*n - (B^
3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B^
2*b^4*c^4 - 4*A*B^2*a*b^3*c^3*d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c
*d^3)*n + 4*(12*A*B^2*a^3*b*d^4*n + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 +
18*B^3*a^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^2)*x)*log(e))*log(d*x + c) + 12*
(72*A^2*B*b^4*c^4 - 288*A^2*B*a*b^3*c^3*d + 432*A^2*B*a^2*b^2*c^2*d^2 - 288
*A^2*B*a^3*b*c*d^3 + 72*A^2*B*a^4*d^4 - 12*(25*(B^3*b^4*c*d^3 - B^3*a*b^3*d
^4)*n^2 + 12*(A*B^2*b^4*c*d^3 - A*B^2*a*b^3*d^4)*n)*x^3 + (9*B^3*b^4*c^4 -
64*B^3*a*b^3*c^3*d + 216*B^3*a^2*b^2*c^2*d^2 - 576*B^3*a^3*b*c*d^3 + 415*B^
3*a^4*d^4)*n^2 + 6*((13*B^3*b^4*c^2*d^2 - 176*B^3*a*b^3*c*d^3 + 163*B^3*a^2
*b^2*d^4)*n^2 + 12*(A*B^2*b^4*c^2*d^2 - 8*A*B^2*a*b^3*c*d^3 + 7*A*B^2*a^2*b
^2*d^4)*n)*x^2 + 12*(3*A*B^2*b^4*c^4 - 16*A*B^2*a*b^3*c^3*d + 36*A*B^2*a^2*
b^2*c^2*d^2 - 48*A*B^2*a^3*b*c*d^3 + 25*A*B^2*a^4*d^4)*n - 4*((7*B^3*b^4*c^
3*d - 60*B^3*a*b^3*c^2*d^2 + 324*B^3*a^2*b^2*c*d^3 - 271*B^3*a^3*b*d^4)*n^2
 + 12*(A*B^2*b^4*c^3*d - 6*A*B^2*a*b^3*c^2*d^2 + 18*A*B^2*a^2*b^2*c*d^3 - 1
3*A*B^2*a^3*b*d^4)*n)*x)*log(e))/(a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3
*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b
^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*
c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7
*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)
*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d
^3 + a^7*b^2*d^4)*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{(bx+a)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^5, x)
```

maple [C] time = 58.08, size = 236754, normalized size = 285.25

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x)
```

```
[Out] result too large to display
```

maxima [B] time = 5.79, size = 5280, normalized size = 6.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x, algorithm="maxi
ma")
```

```
[Out] -1/4*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^
3*x^2 + 4*a^3*b^2*x + a^4*b) + 1/1152*(72*(12*d^4*e*n*log(b*x + a)/(b^5*c^4
 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^
4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2
*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*
e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*
e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4
*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b
^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^
2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d
 + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d +
3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*log((b*x + a)^n*e/(d*x + c)^n)^2/e - (12
*(9*b^4*c^4*e^2*n^2 - 64*a*b^3*c^3*d*e^2*n^2 + 216*a^2*b^2*c^2*d^2*e^2*n^2
- 576*a^3*b*c*d^3*e^2*n^2 + 415*a^4*d^4*e^2*n^2 - 300*(b^4*c*d^3*e^2*n^2 -
a*b^3*d^4*e^2*n^2)*x^3 + 6*(13*b^4*c^2*d^2*e^2*n^2 - 176*a*b^3*c*d^3*e^2*n^
2 + 163*a^2*b^2*d^4*e^2*n^2)*x^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^
2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2
*n^2)*log(b*x + a)^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 +
6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(d*
x + c)^2 - 4*(7*b^4*c^3*d*e^2*n^2 - 60*a*b^3*c^2*d^2*e^2*n^2 + 324*a^2*b^2*
c*d^3*e^2*n^2 - 271*a^3*b*d^4*e^2*n^2)*x - 300*(b^4*d^4*e^2*n^2*x^4 + 4*a*b
^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^
4*d^4*e^2*n^2)*log(b*x + a) + 12*(25*b^4*d^4*e^2*n^2*x^4 + 100*a*b^3*d^4*e^
2*n^2*x^3 + 150*a^2*b^2*d^4*e^2*n^2*x^2 + 100*a^3*b*d^4*e^2*n^2*x + 25*a^4*
d^4*e^2*n^2 - 12*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2
*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a))*l
og(d*x + c))*log((b*x + a)^n*e/(d*x + c)^n)/((a^4*b^5*c^4 - 4*a^5*b^4*c^3*d
 + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3
*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4
- 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3
+ 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 +
a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4
*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)*e) + (27*b^4*c^4*e^3*n^3 - 256*a*b^3*c^3*d
*e^3*n^3 + 1296*a^2*b^2*c^2*d^2*e^3*n^3 - 6912*a^3*b*c*d^3*e^3*n^3 + 5845*a
^4*d^4*e^3*n^3 - 4980*(b^4*c*d^3*e^3*n^3 - a*b^3*d^4*e^3*n^3)*x^3 - 288*(b^
4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4
*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a)^3 + 288*(b^4*d^4*e^3*n
^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*
e^3*n^3*x + a^4*d^4*e^3*n^3)*log(d*x + c)^3 + 30*(23*b^4*c^2*d^2*e^3*n^3 -
544*a*b^3*c*d^3*e^3*n^3 + 521*a^2*b^2*d^4*e^3*n^3)*x^2 + 1800*(b^4*d^4*e^3*
n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4
*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a)^2 + 72*(25*b^4*d^4*e^3*n^3*x^4 +
 100*a*b^3*d^4*e^3*n^3*x^3 + 150*a^2*b^2*d^4*e^3*n^3*x^2 + 100*a^3*b*d^4*e^
3*n^3*x + 25*a^4*d^4*e^3*n^3 - 12*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^
3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3
)*log(b*x + a))*log(d*x + c)^2 - 4*(37*b^4*c^3*d*e^3*n^3 - 456*a*b^3*c^2*d^
2*e^3*n^3 + 4536*a^2*b^2*c*d^3*e^3*n^3 - 4117*a^3*b*d^4*e^3*n^3)*x - 4980*(
b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 +
```

```
 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a) + 12*(415*b^4*d^4*e^
3*n^3*x^4 + 1660*a*b^3*d^4*e^3*n^3*x^3 + 2490*a^2*b^2*d^4*e^3*n^3*x^2 + 166
0*a^3*b*d^4*e^3*n^3*x + 415*a^4*d^4*e^3*n^3 + 72*(b^4*d^4*e^3*n^3*x^4 + 4*a
*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x +
a^4*d^4*e^3*n^3)*log(b*x + a)^2 - 300*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^
3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3
*n^3)*log(b*x + a))*log(d*x + c))/((a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b
^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2
*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^
7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b
^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^
4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c
*d^3 + a^7*b^2*d^4)*x)*e^2))/e)*B^3 + 1/96*A*B^2*(12*(12*d^4*e*n*log(b*x +
a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d
^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2
- 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a
*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7
*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e
*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*
c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3
*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^
3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b
^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*log((b*x + a)^n*e/(d*x + c)^n
)/e - (9*b^4*c^4*e^2*n^2 - 64*a*b^3*c^3*d*e^2*n^2 + 216*a^2*b^2*c^2*d^2*e^2
*n^2 - 576*a^3*b*c*d^3*e^2*n^2 + 415*a^4*d^4*e^2*n^2 - 300*(b^4*c*d^3*e^2*n
^2 - a*b^3*d^4*e^2*n^2)*x^3 + 6*(13*b^4*c^2*d^2*e^2*n^2 - 176*a*b^3*c*d^3*e
^2*n^2 + 163*a^2*b^2*d^4*e^2*n^2)*x^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d
^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^
4*e^2*n^2)*log(b*x + a)^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x
^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*l
og(d*x + c)^2 - 4*(7*b^4*c^3*d*e^2*n^2 - 60*a*b^3*c^2*d^2*e^2*n^2 + 324*a^2
*b^2*c*d^3*e^2*n^2 - 271*a^3*b*d^4*e^2*n^2)*x - 300*(b^4*d^4*e^2*n^2*x^4 +
4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x
 + a^4*d^4*e^2*n^2)*log(b*x + a) + 12*(25*b^4*d^4*e^2*n^2*x^4 + 100*a*b^3*d
^4*e^2*n^2*x^3 + 150*a^2*b^2*d^4*e^2*n^2*x^2 + 100*a^3*b*d^4*e^2*n^2*x + 25
*a^4*d^4*e^2*n^2 - 12*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^
2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x +
a))*log(d*x + c))/((a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a
^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4
*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*
b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b
^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*
b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d
^4)*x)*e^2)) - 3/4*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^5*x^4 + 4*a*b^
4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) + 1/16*(12*d^4*e*n*log(b*x + a
)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^
4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*
b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*
a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*
n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c
^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*
a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3
*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^
4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*A^2*B/e - 3/4*A^2*B*log((b*x +
 a)^n*e/(d*x + c)^n)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x +
 a^4*b) - 1/4*A^3/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^
4*b)
```

mupad [B] time = 11.29, size = 4257, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(a + b*x)^5,x)
```

```
[Out] log((e*(a + b*x)^n)/(c + d*x)^n)*((x*((a*d + b*c)*(a*((9*B^3*a*d^2*n^2)/2 -
 (3*B^3*b*c*d*n^2)/2) + 13*B^3*a^2*d^2*n^2 + (11*B^3*b^2*c^2*n^2)/2 - 6*A^2
*B*a^2*d^2 - 6*A^2*B*b^2*c^2 - (31*B^3*a*b*c*d*n^2)/2 + 12*A^2*B*a*b*c*d) +
 a*c*(b*((9*B^3*a*d^2*n^2)/2 - (3*B^3*b*c*d*n^2)/2) + (27*B^3*a*b*d^2*n^2)/
2 - (9*B^3*b^2*c*d*n^2)/2)) + x^2*((a*d + b*c)*(b*((9*B^3*a*d^2*n^2)/2 - (3
*B^3*b*c*d*n^2)/2) + (27*B^3*a*b*d^2*n^2)/2 - (9*B^3*b^2*c*d*n^2)/2) + b*d*
(a*((9*B^3*a*d^2*n^2)/2 - (3*B^3*b*c*d*n^2)/2) + 13*B^3*a^2*d^2*n^2 + (11*B
^3*b^2*c^2*n^2)/2 - 6*A^2*B*a^2*d^2 - 6*A^2*B*b^2*c^2 - (31*B^3*a*b*c*d*n^2
)/2 + 12*A^2*B*a*b*c*d) + 6*B^3*a*b^2*c*d^2*n^2) + x^3*(b*d*(b*((9*B^3*a*d^
2*n^2)/2 - (3*B^3*b*c*d*n^2)/2) + (27*B^3*a*b*d^2*n^2)/2 - (9*B^3*b^2*c*d*n
^2)/2) + 6*B^3*b^2*d^2*n^2*(a*d + b*c)) + a*c*(a*((9*B^3*a*d^2*n^2)/2 - (3*
B^3*b*c*d*n^2)/2) + 13*B^3*a^2*d^2*n^2 + (11*B^3*b^2*c^2*n^2)/2 - 6*A^2*B*a
^2*d^2 - 6*A^2*B*b^2*c^2 - (31*B^3*a*b*c*d*n^2)/2 + 12*A^2*B*a*b*c*d) + 6*B
^3*b^3*d^3*n^2*x^4)/(8*b*(a*d - b*c)^2*(a + b*x)^5*(c + d*x)) - (d^4*(12*A*
B^2 + 25*B^3*n)*(x^3*((a*d + b*c)*(b*(b*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n
*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2)) + (4*b^2*n*(a*d - b*c)^3*(4*a*d - b*
c))/(3*d^2) + (4*a*b^2*n*(a*d - b*c)^3)/d) + (2*b^3*n*(a*d - b*c)^3*(4*a*d
- b*c))/d^2 + (6*a*b^3*n*(a*d - b*c)^3)/d) + b*d*(b*(a*((2*a*b*n*(a*d - b*c
)^3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2)) + (2*b*n*(a*d - b*c)^
3*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3)) + a*(b*((2*a*b*n*(a*d - b*c)^
3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2)) + (4*b^2*n*(a*d - b*c)^
3*(4*a*d - b*c))/(3*d^2) + (4*a*b^2*n*(a*d - b*c)^3)/d) + (2*b^2*n*(a*d - b
*c)^3*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/d^3) + (8*a*b^4*c*n*(a*d - b*c)^3)
/d) + x^2*((a*d + b*c)*(b*(a*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d - b*c
)^3*(4*a*d - b*c))/(3*d^2)) + (2*b*n*(a*d - b*c)^3*(6*a^2*d^2 + b^2*c^2 - 4
*a*b*c*d))/(3*d^3)) + a*(b*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d - b*c)^
3*(4*a*d - b*c))/(3*d^2)) + (4*b^2*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2) +
 (4*a*b^2*n*(a*d - b*c)^3)/d) + (2*b^2*n*(a*d - b*c)^3*(6*a^2*d^2 + b^2*c^2
 - 4*a*b*c*d))/d^3) + a*c*(b*(b*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d -
b*c)^3*(4*a*d - b*c))/(3*d^2)) + (4*b^2*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d
^2) + (4*a*b^2*n*(a*d - b*c)^3)/d) + (2*b^3*n*(a*d - b*c)^3*(4*a*d - b*c))/
d^2 + (6*a*b^3*n*(a*d - b*c)^3)/d) + b*d*(a*(a*((2*a*b*n*(a*d - b*c)^3)/d +
 (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2)) + (2*b*n*(a*d - b*c)^3*(6*a^2
*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3)) + (2*b*n*(a*d - b*c)^3*(4*a^3*d^3 - b
^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/d^4)) + x*((a*(a*((2*a*b*n*(a*d -
b*c)^3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2)) + (2*b*n*(a*d - b*
c)^3*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3)) + (2*b*n*(a*d - b*c)^3*(4*
a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/d^4)*(a*d + b*c) + a*c*
(b*(a*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d
^2)) + (2*b*n*(a*d - b*c)^3*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3)) + a
*(b*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2
)) + (4*b^2*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2) + (4*a*b^2*n*(a*d - b*c)
^3)/d) + (2*b^2*n*(a*d - b*c)^3*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/d^3)) +
x^4*(b*d*(b*(b*((2*a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b
*c))/(3*d^2)) + (4*b^2*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2) + (4*a*b^2*n*
(a*d - b*c)^3)/d) + (2*b^3*n*(a*d - b*c)^3*(4*a*d - b*c))/d^2 + (6*a*b^3*n*
(a*d - b*c)^3)/d) + (8*b^4*n*(a*d + b*c)*(a*d - b*c)^3)/d) + a*c*(a*(a*((2*
a*b*n*(a*d - b*c)^3)/d + (2*b*n*(a*d - b*c)^3*(4*a*d - b*c))/(3*d^2)) + (2*
b*n*(a*d - b*c)^3*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3)) + (2*b*n*(a*d
 - b*c)^3*(4*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d^2))/d^4) + 8*b
^5*n*x^5*(a*d - b*c)^3))/(64*b^2*(a*d - b*c)^2*(a + b*x)^5*(c + d*x)*(a^4*d
^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - log((
```

```
e*(a + b*x)^n)/(c + d*x)^n)^3*(B^3/(4*b*(a^4 + b^4*x^4 + 4*a*b^3*x^3 + 6*a^
2*b^2*x^2 + 4*a^3*b*x)) - (B^3*d^4)/(4*b*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2
*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - log((e*(a + b*x)^n)/(c + d*x)^n)^
2*((3*A*B^2)/(4*(a^4*b + b^5*x^4 + 4*a^3*b^2*x + 4*a*b^4*x^3 + 6*a^2*b^3*x^
2)) - (d^4*(12*A*B^2 + 25*B^3*n))/(16*b*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*
d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) + (3*B^3*d^4*(x^2*(b*(b*((b*n*(a*d -
b*c)*(4*a*d - b*c))/(3*d^2) + (a*b*n*(a*d - b*c))/d) + (2*a*b^2*n*(a*d - b*
c))/d + (2*b^2*n*(a*d - b*c)*(4*a*d - b*c))/(3*d^2)) + (3*a*b^3*n*(a*d - b*
c))/d + (b^3*n*(a*d - b*c)*(4*a*d - b*c))/d^2) + a*(a*((b*n*(a*d - b*c)*(4*
a*d - b*c))/(3*d^2) + (a*b*n*(a*d - b*c))/d) + (b*n*(a*d - b*c)*(6*a^2*d^2
+ b^2*c^2 - 4*a*b*c*d))/(3*d^3)) + x*(b*(a*((b*n*(a*d - b*c)*(4*a*d - b*c))
/(3*d^2) + (a*b*n*(a*d - b*c))/d) + (b*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 -
 4*a*b*c*d))/(3*d^3)) + a*(b*((b*n*(a*d - b*c)*(4*a*d - b*c))/(3*d^2) + (a*
b*n*(a*d - b*c))/d) + (2*a*b^2*n*(a*d - b*c))/d + (2*b^2*n*(a*d - b*c)*(4*a
*d - b*c))/(3*d^2)) + (b^2*n*(a*d - b*c)*(6*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))
/d^3) + (b*n*(a*d - b*c)*(4*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d
^2))/d^4 + (4*b^4*n*x^3*(a*d - b*c))/d))/(16*b*(a^4*b + b^5*x^4 + 4*a^3*b^2
*x + 4*a*b^4*x^3 + 6*a^2*b^3*x^2)*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 -
4*a*b^3*c^3*d - 4*a^3*b*c*d^3))) - ((288*A^3*a^3*d^3 - 288*A^3*b^3*c^3 + 58
45*B^3*a^3*d^3*n^3 - 27*B^3*b^3*c^3*n^3 + 1800*A^2*B*a^3*d^3*n - 216*A^2*B*
b^3*c^3*n + 864*A^3*a*b^2*c^2*d - 864*A^3*a^2*b*c*d^2 + 4980*A*B^2*a^3*d^3*
n^2 - 108*A*B^2*b^3*c^3*n^2 + 229*B^3*a*b^2*c^2*d*n^3 - 1067*B^3*a^2*b*c*d^
2*n^3 + 660*A*B^2*a*b^2*c^2*d*n^2 - 1932*A*B^2*a^2*b*c*d^2*n^2 + 936*A^2*B*
a*b^2*c^2*d*n - 1656*A^2*B*a^2*b*c*d^2*n)/(12*(a*d - b*c)) + (x^2*(2605*B^3
*a*b^2*d^3*n^3 - 115*B^3*b^3*c*d^2*n^3 + 504*A^2*B*a*b^2*d^3*n - 72*A^2*B*b
^3*c*d^2*n + 1956*A*B^2*a*b^2*d^3*n^2 - 156*A*B^2*b^3*c*d^2*n^2))/(2*(a*d -
 b*c)) + (x*(4117*B^3*a^2*b*d^3*n^3 + 37*B^3*b^3*c^2*d*n^3 - 419*B^3*a*b^2*
c*d^2*n^3 + 936*A^2*B*a^2*b*d^3*n + 72*A^2*B*b^3*c^2*d*n + 3252*A*B^2*a^2*b
*d^3*n^2 + 84*A*B^2*b^3*c^2*d*n^2 - 636*A*B^2*a*b^2*c*d^2*n^2 - 360*A^2*B*a
*b^2*c*d^2*n))/(3*(a*d - b*c)) + (x^3*(415*B^3*b^3*d^3*n^3 + 72*A^2*B*b^3*d
^3*n + 300*A*B^2*b^3*d^3*n^2))/(a*d - b*c))/(x*(384*a^3*b^4*c^2 + 384*a^5*b
^2*d^2 - 768*a^4*b^3*c*d) + x^3*(384*a*b^6*c^2 + 384*a^3*b^4*d^2 - 768*a^2*
b^5*c*d) + x^4*(96*b^7*c^2 + 96*a^2*b^5*d^2 - 192*a*b^6*c*d) + x^2*(576*a^2
*b^5*c^2 + 576*a^4*b^3*d^2 - 1152*a^3*b^4*c*d) + 96*a^6*b*d^2 + 96*a^4*b^3*
c^2 - 192*a^5*b^2*c*d) + (B*d^4*n*atan((B*d^4*n*((b^5*c^4 - a^4*b*d^4 + 2*a
^3*b^2*c*d^3 - 2*a*b^4*c^3*d)/(b^4*c^3 - a^3*b*d^3 + 3*a^2*b^2*c*d^2 - 3*a*
b^3*c^2*d) + 2*b*d*x)*(72*A^2 + 415*B^2*n^2 + 300*A*B*n)*(b^4*c^3 - a^3*b*d
^3 + 3*a^2*b^2*c*d^2 - 3*a*b^3*c^2*d)*1i)/(b*(a*d - b*c)^4*(415*B^3*d^4*n^3
 + 72*A^2*B*d^4*n + 300*A*B^2*d^4*n^2)))*(72*A^2 + 415*B^2*n^2 + 300*A*B*n)
*1i)/(48*b*(a*d - b*c)^4)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**5,x)
```

```
[Out] Timed out
```

3.172 $\int \frac{1}{(ag+bgx)^2\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)}\,dx$

Optimal. Leaf size=96

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

```
[Out] exp(A/B/n)*(d*x+c)*(e*(b*x+a)^n/((d*x+c)^n))^(1/n)*Ei((-A-B*ln(e*(b*x+a)^n/
((d*x+c)^n)))/B/n)/B/(-a*d+b*c)/g^2/n/(b*x+a)
```

Rubi [F] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Mathematica [F] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

fricas [A] time = 0.61, size = 62, normalized size = 0.65

$$\frac{e^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)}{(Bbc-Bad)g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
fricas")
```

```
[Out] e^((B*log(e) + A)/(B*n))*log_integral((d*x + c)*e^(-(B*log(e) + A)/(B*n))/(
b*x + a))/((B*b*c - B*a*d)*g^2*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^2\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

maple [F] time = 4.52, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2} \left(B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)^{2}\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^{n}}{(c+d\,x)^{n}}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

3.173 $\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx$

Optimal. Leaf size=180

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5b}+\frac{Bg^4(bc-ad)^5\log(c+dx)}{5bd^5}-\frac{Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}-Bg^4(a+$$

```
[Out] -1/5*B*(-a*d+b*c)^4*g^4*x/d^4+1/10*B*(-a*d+b*c)^3*g^4*(b*x+a)^2/b/d^3-1/15*
B*(-a*d+b*c)^2*g^4*(b*x+a)^3/b/d^2+1/20*B*(-a*d+b*c)*g^4*(b*x+a)^4/b/d+1/5*
B*(-a*d+b*c)^5*g^4*ln(d*x+c)/b/d^5+1/5*g^4*(b*x+a)^5*(A+B*ln(e*(d*x+c)/(b*x
+a)))/b
```

Rubi [A] time = 0.12, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5b}-\frac{Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}-\frac{Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}+\frac{Bg^4(bc-a}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(10*b*
d^3) - (B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) + (B*(b*c - a*d)*g^4*(a
 + b*x)^4)/(20*b*d) + (B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5) + (g^4*(
a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(5*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx=\frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5b}-\frac{B\int\frac{(-bc+ad)g^5(a+bx)^4}{c+dx}dx}{5bg}$$

$$=\frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5b}+\frac{\left(B(bc-ad)g^4\right)\int\frac{(a+bx)^4}{c+dx}dx}{5b}$$

$$=\frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5b}+\frac{\left(B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3}{d^4}\right.}{}$$

$$=-\frac{B(bc-ad)^4g^4x}{5d^4}+\frac{B(bc-ad)^3g^4(a+bx)^2}{10bd^3}-\frac{B(bc-ad)^2g^4(a+}{15bd^2}$$

Mathematica [**A**] time = 0.10, size = 142, normalized size = 0.79

$$\frac{g^4\left((a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)-\frac{B(ad-bc)\left(4d^3(a+bx)^3(ad-bc)+6d^2(a+bx)^2(bc-ad)^2-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(a\right.}{12d^5}\right.}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g^4*(-1/12*(B*(-(b*c) + a*d)*(-12*b*d*(b*c - a*d)^3*x + 6*d^2*(b*c - a*d)^
2*(a + b*x)^2 + 4*d^3*(-(b*c) + a*d)*(a + b*x)^3 + 3*d^4*(a + b*x)^4 + 12*(
b*c - a*d)^4*Log[c + d*x]))/d^5 + (a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a +
 b*x)])))/(5*b)
```

fricas [**B**] time = 0.85, size = 433, normalized size = 2.41

$$\frac{12\,Ab^5d^5g^4x^5-12\,Ba^5d^5g^4\log(bx+a)+3\left(Bb^5cd^4+(20\,A-B)ab^4d^5\right)g^4x^4-4\left(Bb^5c^2d^3-5\,Bab^4cd^4-2\,(15\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 - 12*B*a^5*d^5*g^4*log(b*x + a) + 3*(B*b^5*c*d^4
 + (20*A - B)*a*b^4*d^5)*g^4*x^4 - 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 - 2*(
15*A - 2*B)*a^2*b^3*d^5)*g^4*x^3 + 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 1
0*B*a^2*b^3*c*d^4 + 2*(10*A - 3*B)*a^3*b^2*d^5)*g^4*x^2 - 12*(B*b^5*c^4*d -
 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 10*B*a^3*b^2*c*d^4 - (5*A - 4*B
)*a^4*b*d^5)*g^4*x + 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2
 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 12*(B*b^5*d^5
*g^4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*
d^5*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^5)
```

giac [**B**] time = 1.53, size = 5960, normalized size = 33.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] -1/60*(12*B*b^6*c^6*d^5*g^4*e^6*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 72*
B*a*b^5*c^5*d^6*g^4*e^6*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 180*B*a^2*b
^4*c^4*d^7*g^4*e^6*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 240*B*a^3*b^3*c^
```

```
3*d^8*g^4*e^6*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 180*B*a^4*b^2*c^2*d^9
*g^4*e^6*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 72*B*a^5*b*c*d^10*g^4*e^6*
log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 12*B*a^6*d^11*g^4*e^6*log(-d*e + (d
*x*e + c*e)*b/(b*x + a)) - 60*(d*x*e + c*e)*B*b^7*c^6*d^4*g^4*e^5*log(-d*e
+ (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 360*(d*x*e + c*e)*B*a*b^6*c^5*d^5*
g^4*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) - 900*(d*x*e + c*e)
*B*a^2*b^5*c^4*d^6*g^4*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)
+ 1200*(d*x*e + c*e)*B*a^3*b^4*c^3*d^7*g^4*e^5*log(-d*e + (d*x*e + c*e)*b/(
b*x + a))/(b*x + a) - 900*(d*x*e + c*e)*B*a^4*b^3*c^2*d^8*g^4*e^5*log(-d*e
+ (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 360*(d*x*e + c*e)*B*a^5*b^2*c*d^9*
g^4*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) - 60*(d*x*e + c*e)*
B*a^6*b*d^10*g^4*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 120*
(d*x*e + c*e)^2*B*b^8*c^6*d^3*g^4*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))
/(b*x + a)^2 - 720*(d*x*e + c*e)^2*B*a*b^7*c^5*d^4*g^4*e^4*log(-d*e + (d*x*
e + c*e)*b/(b*x + a))/(b*x + a)^2 + 1800*(d*x*e + c*e)^2*B*a^2*b^6*c^4*d^5*
g^4*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 - 2400*(d*x*e + c
*e)^2*B*a^3*b^5*c^3*d^6*g^4*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x
+ a)^2 + 1800*(d*x*e + c*e)^2*B*a^4*b^4*c^2*d^7*g^4*e^4*log(-d*e + (d*x*e +
 c*e)*b/(b*x + a))/(b*x + a)^2 - 720*(d*x*e + c*e)^2*B*a^5*b^3*c*d^8*g^4*e^
4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 + 120*(d*x*e + c*e)^2*B
*a^6*b^2*d^9*g^4*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 - 12
0*(d*x*e + c*e)^3*B*b^9*c^6*d^2*g^4*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a
))/(b*x + a)^3 + 720*(d*x*e + c*e)^3*B*a*b^8*c^5*d^3*g^4*e^3*log(-d*e + (d*
x*e + c*e)*b/(b*x + a))/(b*x + a)^3 - 1800*(d*x*e + c*e)^3*B*a^2*b^7*c^4*d^
4*g^4*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 + 2400*(d*x*e +
 c*e)^3*B*a^3*b^6*c^3*d^5*g^4*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*
x + a)^3 - 1800*(d*x*e + c*e)^3*B*a^4*b^5*c^2*d^6*g^4*e^3*log(-d*e + (d*x*e
 + c*e)*b/(b*x + a))/(b*x + a)^3 + 720*(d*x*e + c*e)^3*B*a^5*b^4*c*d^7*g^4*
e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 - 120*(d*x*e + c*e)^3
*B*a^6*b^3*d^8*g^4*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 +
60*(d*x*e + c*e)^4*B*b^10*c^6*d*g^4*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a
))/(b*x + a)^4 - 360*(d*x*e + c*e)^4*B*a*b^9*c^5*d^2*g^4*e^2*log(-d*e + (d*
x*e + c*e)*b/(b*x + a))/(b*x + a)^4 + 900*(d*x*e + c*e)^4*B*a^2*b^8*c^4*d^3
*g^4*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^4 - 1200*(d*x*e +
c*e)^4*B*a^3*b^7*c^3*d^4*g^4*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x
 + a)^4 + 900*(d*x*e + c*e)^4*B*a^4*b^6*c^2*d^5*g^4*e^2*log(-d*e + (d*x*e +
 c*e)*b/(b*x + a))/(b*x + a)^4 - 360*(d*x*e + c*e)^4*B*a^5*b^5*c*d^6*g^4*e^
2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^4 + 60*(d*x*e + c*e)^4*B*
a^6*b^4*d^7*g^4*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^4 - 12*
(d*x*e + c*e)^5*B*b^11*c^6*g^4*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x
 + a)^5 + 72*(d*x*e + c*e)^5*B*a*b^10*c^5*d*g^4*e*log(-d*e + (d*x*e + c*e)*
b/(b*x + a))/(b*x + a)^5 - 180*(d*x*e + c*e)^5*B*a^2*b^9*c^4*d^2*g^4*e*log(
-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^5 + 240*(d*x*e + c*e)^5*B*a^3*b
^8*c^3*d^3*g^4*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^5 - 180*(d
*x*e + c*e)^5*B*a^4*b^7*c^2*d^4*g^4*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))
/(b*x + a)^5 + 72*(d*x*e + c*e)^5*B*a^5*b^6*c*d^5*g^4*e*log(-d*e + (d*x*e +
 c*e)*b/(b*x + a))/(b*x + a)^5 - 12*(d*x*e + c*e)^5*B*a^6*b^5*d^6*g^4*e*log
(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^5 + 60*(d*x*e + c*e)*B*b^7*c^6
*d^4*g^4*e^5*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 360*(d*x*e + c*e)*B*a
*b^6*c^5*d^5*g^4*e^5*log((d*x*e + c*e)/(b*x + a))/(b*x + a) + 900*(d*x*e +
c*e)*B*a^2*b^5*c^4*d^6*g^4*e^5*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 120
0*(d*x*e + c*e)*B*a^3*b^4*c^3*d^7*g^4*e^5*log((d*x*e + c*e)/(b*x + a))/(b*x
 + a) + 900*(d*x*e + c*e)*B*a^4*b^3*c^2*d^8*g^4*e^5*log((d*x*e + c*e)/(b*x
+ a))/(b*x + a) - 360*(d*x*e + c*e)*B*a^5*b^2*c*d^9*g^4*e^5*log((d*x*e + c*
e)/(b*x + a))/(b*x + a) + 60*(d*x*e + c*e)*B*a^6*b*d^10*g^4*e^5*log((d*x*e
+ c*e)/(b*x + a))/(b*x + a) - 120*(d*x*e + c*e)^2*B*b^8*c^6*d^3*g^4*e^4*log
((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 720*(d*x*e + c*e)^2*B*a*b^7*c^5*d^4
*g^4*e^4*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 - 1800*(d*x*e + c*e)^2*B*
a^2*b^6*c^4*d^5*g^4*e^4*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 2400*(d*
```

```
x*e + c*e)^2*B*a^3*b^5*c^3*d^6*g^4*e^4*log((d*x*e + c*e)/(b*x + a))/(b*x +
a)^2 - 1800*(d*x*e + c*e)^2*B*a^4*b^4*c^2*d^7*g^4*e^4*log((d*x*e + c*e)/(b*
x + a))/(b*x + a)^2 + 720*(d*x*e + c*e)^2*B*a^5*b^3*c*d^8*g^4*e^4*log((d*x*
e + c*e)/(b*x + a))/(b*x + a)^2 - 120*(d*x*e + c*e)^2*B*a^6*b^2*d^9*g^4*e^4
*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 120*(d*x*e + c*e)^3*B*b^9*c^6*d
^2*g^4*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 720*(d*x*e + c*e)^3*B
*a*b^8*c^5*d^3*g^4*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 + 1800*(d*x
*e + c*e)^3*B*a^2*b^7*c^4*d^4*g^4*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a
)^3 - 2400*(d*x*e + c*e)^3*B*a^3*b^6*c^3*d^5*g^4*e^3*log((d*x*e + c*e)/(b*x
 + a))/(b*x + a)^3 + 1800*(d*x*e + c*e)^3*B*a^4*b^5*c^2*d^6*g^4*e^3*log((d*
x*e + c*e)/(b*x + a))/(b*x + a)^3 - 720*(d*x*e + c*e)^3*B*a^5*b^4*c*d^7*g^4
*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 + 120*(d*x*e + c*e)^3*B*a^6*b
^3*d^8*g^4*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 60*(d*x*e + c*e)^
4*B*b^10*c^6*d*g^4*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 + 360*(d*x*
e + c*e)^4*B*a*b^9*c^5*d^2*g^4*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4
 - 900*(d*x*e + c*e)^4*B*a^2*b^8*c^4*d^3*g^4*e^2*log((d*x*e + c*e)/(b*x + a
))/(b*x + a)^4 + 1200*(d*x*e + c*e)^4*B*a^3*b^7*c^3*d^4*g^4*e^2*log((d*x*e
+ c*e)/(b*x + a))/(b*x + a)^4 - 900*(d*x*e + c*e)^4*B*a^4*b^6*c^2*d^5*g^4*e
^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 + 360*(d*x*e + c*e)^4*B*a^5*b^5
*c*d^6*g^4*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 - 60*(d*x*e + c*e)^
4*B*a^6*b^4*d^7*g^4*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 + 12*(d*x*
e + c*e)^5*B*b^11*c^6*g^4*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^5 - 72*(
d*x*e + c*e)^5*B*a*b^10*c^5*d*g^4*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^
5 + 180*(d*x*e + c*e)^5*B*a^2*b^9*c^4*d^2*g^4*e*log((d*x*e + c*e)/(b*x + a)
)/(b*x + a)^5 - 240*(d*x*e + c*e)^5*B*a^3*b^8*c^3*d^3*g^4*e*log((d*x*e + c*
e)/(b*x + a))/(b*x + a)^5 + 180*(d*x*e + c*e)^5*B*a^4*b^7*c^2*d^4*g^4*e*log
((d*x*e + c*e)/(b*x + a))/(b*x + a)^5 - 72*(d*x*e + c*e)^5*B*a^5*b^6*c*d^5*
g^4*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^5 + 12*(d*x*e + c*e)^5*B*a^6*b
^5*d^6*g^4*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^5 + 12*A*b^6*c^6*d^5*g^
4*e^6 - 25*B*b^6*c^6*d^5*g^4*e^6 - 72*A*a*b^5*c^5*d^6*g^4*e^6 + 150*B*a*b^5
*c^5*d^6*g^4*e^6 + 180*A*a^2*b^4*c^4*d^7*g^4*e^6 - 375*B*a^2*b^4*c^4*d^7*g^
4*e^6 - 240*A*a^3*b^3*c^3*d^8*g^4*e^6 + 500*B*a^3*b^3*c^3*d^8*g^4*e^6 + 180
*A*a^4*b^2*c^2*d^9*g^4*e^6 - 375*B*a^4*b^2*c^2*d^9*g^4*e^6 - 72*A*a^5*b*c*d
^10*g^4*e^6 + 150*B*a^5*b*c*d^10*g^4*e^6 + 12*A*a^6*d^11*g^4*e^6 - 25*B*a^6
*d^11*g^4*e^6 + 77*(d*x*e + c*e)*B*b^7*c^6*d^4*g^4*e^5/(b*x + a) - 462*(d*x
*e + c*e)*B*a*b^6*c^5*d^5*g^4*e^5/(b*x + a) + 1155*(d*x*e + c*e)*B*a^2*b^5*
c^4*d^6*g^4*e^5/(b*x + a) - 1540*(d*x*e + c*e)*B*a^3*b^4*c^3*d^7*g^4*e^5/(b
*x + a) + 1155*(d*x*e + c*e)*B*a^4*b^3*c^2*d^8*g^4*e^5/(b*x + a) - 462*(d*x
*e + c*e)*B*a^5*b^2*c*d^9*g^4*e^5/(b*x + a) + 77*(d*x*e + c*e)*B*a^6*b*d^10
*g^4*e^5/(b*x + a) - 94*(d*x*e + c*e)^2*B*b^8*c^6*d^3*g^4*e^4/(b*x + a)^2 +
 564*(d*x*e + c*e)^2*B*a*b^7*c^5*d^4*g^4*e^4/(b*x + a)^2 - 1410*(d*x*e + c*
e)^2*B*a^2*b^6*c^4*d^5*g^4*e^4/(b*x + a)^2 + 1880*(d*x*e + c*e)^2*B*a^3*b^5
*c^3*d^6*g^4*e^4/(b*x + a)^2 - 1410*(d*x*e + c*e)^2*B*a^4*b^4*c^2*d^7*g^4*e
^4/(b*x + a)^2 + 564*(d*x*e + c*e)^2*B*a^5*b^3*c*d^8*g^4*e^4/(b*x + a)^2 -
94*(d*x*e + c*e)^2*B*a^6*b^2*d^9*g^4*e^4/(b*x + a)^2 + 54*(d*x*e + c*e)^3*B
*b^9*c^6*d^2*g^4*e^3/(b*x + a)^3 - 324*(d*x*e + c*e)^3*B*a*b^8*c^5*d^3*g^4*
e^3/(b*x + a)^3 + 810*(d*x*e + c*e)^3*B*a^2*b^7*c^4*d^4*g^4*e^3/(b*x + a)^3
 - 1080*(d*x*e + c*e)^3*B*a^3*b^6*c^3*d^5*g^4*e^3/(b*x + a)^3 + 810*(d*x*e
+ c*e)^3*B*a^4*b^5*c^2*d^6*g^4*e^3/(b*x + a)^3 - 324*(d*x*e + c*e)^3*B*a^5*
b^4*c*d^7*g^4*e^3/(b*x + a)^3 + 54*(d*x*e + c*e)^3*B*a^6*b^3*d^8*g^4*e^3/(b
*x + a)^3 - 12*(d*x*e + c*e)^4*B*b^10*c^6*d*g^4*e^2/(b*x + a)^4 + 72*(d*x*e
 + c*e)^4*B*a*b^9*c^5*d^2*g^4*e^2/(b*x + a)^4 - 180*(d*x*e + c*e)^4*B*a^2*b
^8*c^4*d^3*g^4*e^2/(b*x + a)^4 + 240*(d*x*e + c*e)^4*B*a^3*b^7*c^3*d^4*g^4*
e^2/(b*x + a)^4 - 180*(d*x*e + c*e)^4*B*a^4*b^6*c^2*d^5*g^4*e^2/(b*x + a)^4
 + 72*(d*x*e + c*e)^4*B*a^5*b^5*c*d^6*g^4*e^2/(b*x + a)^4 - 12*(d*x*e + c*e
)^4*B*a^6*b^4*d^7*g^4*e^2/(b*x + a)^4)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) -
 a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*d^10*e^5 - 5*(d*x*e + c*e)*b^2*d^9*e
^4/(b*x + a) + 10*(d*x*e + c*e)^2*b^3*d^8*e^3/(b*x + a)^2 - 10*(d*x*e + c*e
)^3*b^4*d^7*e^2/(b*x + a)^3 + 5*(d*x*e + c*e)^4*b^5*d^6*e/(b*x + a)^4 - (d*
```

```
x*e + c*e)^5*b^6*d^5/(b*x + a)^5)
```

maple [**B**] time = 0.14, size = 2930, normalized size = 16.28

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] 1/5*b^4*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+
a)*c)^5*c^5-1/5/b*e^5*A*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^5*d^5+1/5/b*
B*g^4*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^5+1/4*e^4*B*g^4*d^3/(-e/(b*
x+a)*a*d+b*e/(b*x+a)*c)^4*a^4*c-1/3*e^3*B*g^4*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+
a)*c)^3*a^4*c+1/2*e^2*B*g^4*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^4*c+e^5*A*
g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^4*c*d^4-1/20/b*e^4*B*g^4*d^4/(-e/(b*
x+a)*a*d+b*e/(b*x+a)*c)^4*a^5-1/10/b*e^2*B*g^4*d^2/(-e/(b*x+a)*a*d+b*e/(b*x
+a)*c)^2*a^5+1/10*b^4*e^2*B*g^4/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*c^5+1/
20*b^4*e^4*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^5+b^3*B*g^4/d^4*ln(b*
(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a*c^4+2*b*B*g^4/d^2*ln(b*(d*e/b-e*(a*d-b
*c)/b/(b*x+a))-d*e)*a^3*c^2-2*b^2*B*g^4/d^3*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+
a))-d*e)*a^2*c^3+1/15/b*e^3*B*g^4*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^5-
1/15*b^4*e^3*B*g^4/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^5-1/2*b*e^4*B*g^4
*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^3*c^2-1/5/b*e^5*B*g^4*ln(d*e/b-e*(a
*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^5*d^5+e^5*B*g^4*ln(d*
e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^4*d^4*c+1/2*b
^2*e^4*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^2*c^3*d+2/3*b*e^3*B*g^4/(-e
/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^3*c^2*d+1/3*b^3*e^3*B*g^4/d/(-e/(b*x+a)*a*d
+b*e/(b*x+a)*c)^3*c^4*a-1/2*b^3*e^2*B*g^4/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c
)^2*c^4*a+b^2*e^2*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^2*c^3+b^3*e*B*
g^4/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*c^4*a-2*b*e^5*A*g^4/(-e/(b*x+a)*a*d+
b*e/(b*x+a)*c)^5*a^3*c^2*d^3+2*b^2*e^5*A*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)
^5*a^2*c^3*d^2-b^3*e^5*A*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a*c^4*d+2*b*e
*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^3*c^2-2*b^2*e*B*g^4/d^2/(-e/(b*x+
a)*a*d+b*e/(b*x+a)*c)*a^2*c^3-2/3*b^2*e^3*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)
*c)^3*a^2*c^3-1/5*b^4*e*B*g^4/d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*c^5+1/5/b*
e*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^5*d-1/4*b^3*e^4*B*g^4/(-e/(b*x+a)*
a*d+b*e/(b*x+a)*c)^4*c^4*a-b*e^2*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^3
*c^2+42*b^3*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)^5*a^6*c^4/(b*x+a)^5+9*b*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a
))*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^8*c^2/(b*x+a)^5-2*b^8*e^5*B*g^4*l
n(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*c^9/(b*
x+a)^5*a+9*b^7*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^3/(-e/(b*x+a)*a*
d+b*e/(b*x+a)*c)^5*a^2*c^8/(b*x+a)^5+42*b^5*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/
b/(b*x+a))/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^4*c^6/(b*x+a)^5-24*b^6*e^5*
B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*
a^3*c^7/(b*x+a)^5-24*b^2*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/
(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^7*c^3/(b*x+a)^5-2*b*e^5*B*g^4*ln(d*e/b-e*(a*
d-b*c)/b/(b*x+a))*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^3*c^2-2*e^5*B*g^4*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^9*c/
(b*x+a)^5-b^3*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)^5*c^4*a*d+1/5/b*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^5/(
-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^10/(b*x+a)^5+1/5*b^9*e^5*B*g^4*ln(d*e/b-e
*(a*d-b*c)/b/(b*x+a))/d^5/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*c^10/(b*x+a)^5+2
*b^2*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(b*x+a)*a*d+b*e/(b*x
+a)*c)^5*a^2*c^3-252/5*b^4*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b
*x+a)*a*d+b*e/(b*x+a)*c)^5*a^5*c^5/(b*x+a)^5-e*B*g^4/(-e/(b*x+a)*a*d+b*e/(b
*x+a)*c)*a^4*c+1/5*b^4*e^5*A*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*c^5-B*g^4
/d*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^4*c-1/5*b^4*B*g^4/d^5*ln(b*(d*
e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*c^5
```

maxima [B] time = 1.26, size = 619, normalized size = 3.44

$$\frac{1}{5}\,Ab^4g^4x^5+Aab^3g^4x^4+2\,Aa^2b^2g^4x^3+2\,Aa^3bg^4x^2+\left(x\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)-\frac{a\log\left(bx+a\right)}{b}+\frac{c\log\left(dx+c\right)}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b + c*log(d*x
 + c)/d)*B*a^4*g^4 + 2*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + a^2*log(
b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*B*a^3*b*g^4 + (2
*x^3*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*
log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2
*d^2))*B*a^2*b^2*g^4 + 1/6*(6*x^4*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + 6*
a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*
x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B
*a*b^3*g^4 + 1/60*(12*x^5*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - 12*a^5*log
(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 -
4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4
*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

mupad [B] time = 4.86, size = 1008, normalized size = 5.60

$$\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\,\left(B\,a^4\,g^4\,x+2\,B\,a^3\,b\,g^4\,x^2+2\,B\,a^2\,b^2\,g^4\,x^3+B\,a\,b^3\,g^4\,x^4+\frac{B\,b^4\,g^4\,x^5}{5}\right)-x^3\,\left(\frac{\left(\frac{b^3\,g^4\,\left(25\,A\,a\,d+5\,A\,b\,c-\right.}{5\,d}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(c + d*x))/(a + b*x))),x)
```

```
[Out] log((e*(c + d*x))/(a + b*x))*((B*b^4*g^4*x^5)/5 + B*a^4*g^4*x + 2*B*a^3*b*g
^4*x^2 + B*a*b^3*g^4*x^4 + 2*B*a^2*b^2*g^4*x^3) - x^3*((((b^3*g^4*(25*A*a*d
 + 5*A*b*c - B*a*d + B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*
a*d + 5*b*c))/(15*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - B*a*d + B*b*c))/(
3*d) + (A*a*b^3*c*g^4)/(3*d)) + x^2*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d
 + 5*A*b*c - B*a*d + B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*
a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - B*a*d + B*b*c))/d
+ (A*a*b^3*c*g^4)/d))/(10*b*d) + (a^2*b*g^4*(5*A*a*d + 5*A*b*c - B*a*d + B*
b*c))/d - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c - B*a*d + B*b*c))/(5*d) - (A*b
^3*g^4*(5*a*d + 5*b*c))/(5*d)))/(2*b*d)) + x*((a^3*g^4*(5*A*a*d + 10*A*b*c
- 2*B*a*d + 2*B*b*c))/d - ((5*a*d + 5*b*c)*(((5*a*d + 5*b*c)*((((b^3*g^4*(2
5*A*a*d + 5*A*b*c - B*a*d + B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*
d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - B*a*d + B*b
*c))/d + (A*a*b^3*c*g^4)/d))/(5*b*d) + (2*a^2*b*g^4*(5*A*a*d + 5*A*b*c - B*
a*d + B*b*c))/d - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c - B*a*d + B*b*c))/(5*d
) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d)))/(b*d)))/(5*b*d) + (a*c*((((b^3*g^4*
(25*A*a*d + 5*A*b*c - B*a*d + B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(
5*d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - B*a*d + B
*b*c))/d + (A*a*b^3*c*g^4)/d))/(b*d)) + x^4*((b^3*g^4*(25*A*a*d + 5*A*b*c -
```

```
 B*a*d + B*b*c))/(20*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(20*d)) + (log(c + d*
x)*((B*b^4*c^5*g^4)/5 + B*a^4*c*d^4*g^4 - 2*B*a^3*b*c^2*d^3*g^4 + 2*B*a^2*b
^2*c^3*d^2*g^4 - B*a*b^3*c^4*d*g^4))/d^5 + (A*b^4*g^4*x^5)/5 - (B*a^5*g^4*l
og(a + b*x))/(5*b)
```

sympy [B] time = 6.52, size = 969, normalized size = 5.38

$$\frac{Ab^4g^4x^5}{5} - \frac{Ba^5g^4\log\left(x + \frac{\frac{Ba^6d^5g^4}{b} + 5Ba^5cd^4g^4 - 10Ba^4bc^2d^3g^4 + 10Ba^3b^2c^3d^2g^4 - 5Ba^2b^3c^4dg^4 + Bab^4c^5g^4}{Ba^5d^5g^4 + 5Ba^4bcd^4g^4 - 10Ba^3b^2c^2d^3g^4 + 10Ba^2b^3c^3d^2g^4 - 5Bab^4c^4dg^4 + Bb^5c^5g^4}\right)}{5b} + \frac{Bcg^4\left(5a^4d^4 - 10a^3bcd^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b**4*g**4*x**5/5 - B*a**5*g**4*log(x + (B*a**6*d**5*g**4/b + 5*B*a**5*c*d
**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b**2*c**3*d**2*g**4 - 5*B
*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4)/(B*a**5*d**5*g**4 + 5*B*a**4*b
*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d**2*g**
4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*b) + B*c*g**4*(5*a**4*d*
*4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**
4)*log(x + (6*B*a**5*c*d**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b
**2*c**3*d**2*g**4 - 5*B*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4 - B*a*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4) + B*b*c**2*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**
2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/(B*a**5*d**5*g**4 + 5*B*
a**4*b*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d*
*2*g**4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*d**5) + x**4*(A*a*
b**3*g**4 - B*a*b**3*g**4/20 + B*b**4*c*g**4/(20*d)) + x**3*(2*A*a**2*b**2*
g**4 - 4*B*a**2*b**2*g**4/15 + B*a*b**3*c*g**4/(3*d) - B*b**4*c**2*g**4/(15
*d**2)) + x**2*(2*A*a**3*b*g**4 - 3*B*a**3*b*g**4/5 + B*a**2*b**2*c*g**4/d
- B*a*b**3*c**2*g**4/(2*d**2) + B*b**4*c**3*g**4/(10*d**3)) + x*(A*a**4*g**
4 - 4*B*a**4*g**4/5 + 2*B*a**3*b*c*g**4/d - 2*B*a**2*b**2*c**2*g**4/d**2 +
B*a*b**3*c**3*g**4/d**3 - B*b**4*c**4*g**4/(5*d**4)) + (B*a**4*g**4*x + 2*B
*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g**4*x**3 + B*a*b**3*g**4*x**4 + B*b**4*g
**4*x**5/5)*log(e*(c + d*x)/(a + b*x))
```

3.174 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\,dx$

Optimal. Leaf size=149

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{4b}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}+\frac{Bg^3x(bc-ad)^3}{4d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}+Bg^3(a$$

```
[Out] 1/4*B*(-a*d+b*c)^3*g^3*x/d^3-1/8*B*(-a*d+b*c)^2*g^3*(b*x+a)^2/b/d^2+1/12*B*
(-a*d+b*c)*g^3*(b*x+a)^3/b/d-1/4*B*(-a*d+b*c)^4*g^3*ln(d*x+c)/b/d^4+1/4*g^3
*(b*x+a)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))/b
```

Rubi [A] time = 0.10, antiderivative size = 149, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 43}

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{4b}+\frac{Bg^3x(bc-ad)^3}{4d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}+Bg^3(a$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^3*x)/(4*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(8*b*d^
2) + (B*(b*c - a*d)*g^3*(a + b*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*g^3*Log[c
+ d*x])/(4*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/
(4*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b}-\frac{B\int\frac{(-bc+ad)g^4(a+bx)^3}{c+dx}dx}{4bg}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b}+\frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3}{c+dx}dx}{4b}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b}+\left(B(bc-ad)g^3\right)\int\Bigl(\frac{b(bc-ad)^2}{d^3}-b(b$$

$$=\frac{B(bc-ad)^3g^3x}{4d^3}-\frac{B(bc-ad)^2g^3(a+bx)^2}{8bd^2}+\frac{B(bc-ad)g^3(a+bx)^3}{12bd}-$$

Mathematica [A] time = 0.08, size = 120, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{6d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g^3*((B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x
)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/(6*d^4) + (a + b*x
)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])))/(4*b)
```

fricas [B] time = 1.12, size = 320, normalized size = 2.15

$$6\,Ab^4d^4g^3x^4-6\,Ba^4d^4g^3\log(bx+a)+2\left(Bb^4cd^3+(12\,A-B)ab^3d^4\right)g^3x^3-3\,\Bigl(Bb^4c^2d^2-4\,Bab^3cd^3-3\,(4\,A-B$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 - 6*B*a^4*d^4*g^3*log(b*x + a) + 2*(B*b^4*c*d^3 +
 (12*A - B)*a*b^3*d^4)*g^3*x^3 - 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - 3*(4*
A - B)*a^2*b^2*d^4)*g^3*x^2 + 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*
b^2*c*d^3 + (4*A - 3*B)*a^3*b*d^4)*g^3*x - 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 6*(B*b^4*d^4*g^3
*x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*
x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^4)
```

giac [B] time = 1.19, size = 4137, normalized size = 27.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] 1/24*(6*B*b^5*c^5*d^4*g^3*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 30*B*
a*b^4*c^4*d^5*g^3*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 60*B*a^2*b^3*
c^3*d^6*g^3*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 60*B*a^3*b^2*c^2*d^
7*g^3*e^5*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 30*B*a^4*b*c*d^8*g^3*e^5*
log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 6*B*a^5*d^9*g^3*e^5*log(-d*e + (d*x
*e + c*e)*b/(b*x + a)) - 24*(d*x*e + c*e)*B*b^6*c^5*d^3*g^3*e^4*log(-d*e +
```

```
(d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 120*(d*x*e + c*e)*B*a*b^5*c^4*d^4*g^
3*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) - 240*(d*x*e + c*e)*B
*a^2*b^4*c^3*d^5*g^3*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) +
240*(d*x*e + c*e)*B*a^3*b^3*c^2*d^6*g^3*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x
 + a))/(b*x + a) - 120*(d*x*e + c*e)*B*a^4*b^2*c*d^7*g^3*e^4*log(-d*e + (d*
x*e + c*e)*b/(b*x + a))/(b*x + a) + 24*(d*x*e + c*e)*B*a^5*b*d^8*g^3*e^4*lo
g(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 36*(d*x*e + c*e)^2*B*b^7*c^
5*d^2*g^3*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 - 180*(d*x*
e + c*e)^2*B*a*b^6*c^4*d^3*g^3*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b
*x + a)^2 + 360*(d*x*e + c*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3*log(-d*e + (d*x*e
 + c*e)*b/(b*x + a))/(b*x + a)^2 - 360*(d*x*e + c*e)^2*B*a^3*b^4*c^2*d^5*g^
3*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 + 180*(d*x*e + c*e)
^2*B*a^4*b^3*c*d^6*g^3*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^
2 - 36*(d*x*e + c*e)^2*B*a^5*b^2*d^7*g^3*e^3*log(-d*e + (d*x*e + c*e)*b/(b*
x + a))/(b*x + a)^2 - 24*(d*x*e + c*e)^3*B*b^8*c^5*d*g^3*e^2*log(-d*e + (d*
x*e + c*e)*b/(b*x + a))/(b*x + a)^3 + 120*(d*x*e + c*e)^3*B*a*b^7*c^4*d^2*g
^3*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 - 240*(d*x*e + c*e
)^3*B*a^2*b^6*c^3*d^3*g^3*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x +
a)^3 + 240*(d*x*e + c*e)^3*B*a^3*b^5*c^2*d^4*g^3*e^2*log(-d*e + (d*x*e + c*
e)*b/(b*x + a))/(b*x + a)^3 - 120*(d*x*e + c*e)^3*B*a^4*b^4*c*d^5*g^3*e^2*l
og(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 + 24*(d*x*e + c*e)^3*B*a^5
*b^3*d^6*g^3*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 + 6*(d*x
*e + c*e)^4*B*b^9*c^5*g^3*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)
^4 - 30*(d*x*e + c*e)^4*B*a*b^8*c^4*d*g^3*e*log(-d*e + (d*x*e + c*e)*b/(b*x
 + a))/(b*x + a)^4 + 60*(d*x*e + c*e)^4*B*a^2*b^7*c^3*d^2*g^3*e*log(-d*e +
(d*x*e + c*e)*b/(b*x + a))/(b*x + a)^4 - 60*(d*x*e + c*e)^4*B*a^3*b^6*c^2*d
^3*g^3*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^4 + 30*(d*x*e + c*
e)^4*B*a^4*b^5*c*d^4*g^3*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^
4 - 6*(d*x*e + c*e)^4*B*a^5*b^4*d^5*g^3*e*log(-d*e + (d*x*e + c*e)*b/(b*x +
 a))/(b*x + a)^4 + 24*(d*x*e + c*e)*B*b^6*c^5*d^3*g^3*e^4*log((d*x*e + c*e)
/(b*x + a))/(b*x + a) - 120*(d*x*e + c*e)*B*a*b^5*c^4*d^4*g^3*e^4*log((d*x*
e + c*e)/(b*x + a))/(b*x + a) + 240*(d*x*e + c*e)*B*a^2*b^4*c^3*d^5*g^3*e^4
*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 240*(d*x*e + c*e)*B*a^3*b^3*c^2*d
^6*g^3*e^4*log((d*x*e + c*e)/(b*x + a))/(b*x + a) + 120*(d*x*e + c*e)*B*a^4
*b^2*c*d^7*g^3*e^4*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 24*(d*x*e + c*e
)*B*a^5*b*d^8*g^3*e^4*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 36*(d*x*e +
c*e)^2*B*b^7*c^5*d^2*g^3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 180
*(d*x*e + c*e)^2*B*a*b^6*c^4*d^3*g^3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x
+ a)^2 - 360*(d*x*e + c*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3*log((d*x*e + c*e)/(b
*x + a))/(b*x + a)^2 + 360*(d*x*e + c*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3*log((d
*x*e + c*e)/(b*x + a))/(b*x + a)^2 - 180*(d*x*e + c*e)^2*B*a^4*b^3*c*d^6*g^
3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 36*(d*x*e + c*e)^2*B*a^5*b
^2*d^7*g^3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 24*(d*x*e + c*e)^
3*B*b^8*c^5*d*g^3*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 120*(d*x*e
 + c*e)^3*B*a*b^7*c^4*d^2*g^3*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3
+ 240*(d*x*e + c*e)^3*B*a^2*b^6*c^3*d^3*g^3*e^2*log((d*x*e + c*e)/(b*x + a)
)/(b*x + a)^3 - 240*(d*x*e + c*e)^3*B*a^3*b^5*c^2*d^4*g^3*e^2*log((d*x*e +
c*e)/(b*x + a))/(b*x + a)^3 + 120*(d*x*e + c*e)^3*B*a^4*b^4*c*d^5*g^3*e^2*l
og((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 24*(d*x*e + c*e)^3*B*a^5*b^3*d^6*
g^3*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 6*(d*x*e + c*e)^4*B*b^9*
c^5*g^3*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 + 30*(d*x*e + c*e)^4*B*a
*b^8*c^4*d*g^3*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 - 60*(d*x*e + c*e
)^4*B*a^2*b^7*c^3*d^2*g^3*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^4 + 60*(
d*x*e + c*e)^4*B*a^3*b^6*c^2*d^3*g^3*e*log((d*x*e + c*e)/(b*x + a))/(b*x +
a)^4 - 30*(d*x*e + c*e)^4*B*a^4*b^5*c*d^4*g^3*e*log((d*x*e + c*e)/(b*x + a)
)/(b*x + a)^4 + 6*(d*x*e + c*e)^4*B*a^5*b^4*d^5*g^3*e*log((d*x*e + c*e)/(b*
x + a))/(b*x + a)^4 + 6*A*b^5*c^5*d^4*g^3*e^5 - 11*B*b^5*c^5*d^4*g^3*e^5 -
30*A*a*b^4*c^4*d^5*g^3*e^5 + 55*B*a*b^4*c^4*d^5*g^3*e^5 + 60*A*a^2*b^3*c^3*
d^6*g^3*e^5 - 110*B*a^2*b^3*c^3*d^6*g^3*e^5 - 60*A*a^3*b^2*c^2*d^7*g^3*e^5
```

```
+ 110*B*a^3*b^2*c^2*d^7*g^3*e^5 + 30*A*a^4*b*c*d^8*g^3*e^5 - 55*B*a^4*b*c*d
^8*g^3*e^5 - 6*A*a^5*d^9*g^3*e^5 + 11*B*a^5*d^9*g^3*e^5 + 26*(d*x*e + c*e)*
B*b^6*c^5*d^3*g^3*e^4/(b*x + a) - 130*(d*x*e + c*e)*B*a*b^5*c^4*d^4*g^3*e^4
/(b*x + a) + 260*(d*x*e + c*e)*B*a^2*b^4*c^3*d^5*g^3*e^4/(b*x + a) - 260*(d
*x*e + c*e)*B*a^3*b^3*c^2*d^6*g^3*e^4/(b*x + a) + 130*(d*x*e + c*e)*B*a^4*b
^2*c*d^7*g^3*e^4/(b*x + a) - 26*(d*x*e + c*e)*B*a^5*b*d^8*g^3*e^4/(b*x + a)
 - 21*(d*x*e + c*e)^2*B*b^7*c^5*d^2*g^3*e^3/(b*x + a)^2 + 105*(d*x*e + c*e)
^2*B*a*b^6*c^4*d^3*g^3*e^3/(b*x + a)^2 - 210*(d*x*e + c*e)^2*B*a^2*b^5*c^3*
d^4*g^3*e^3/(b*x + a)^2 + 210*(d*x*e + c*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3/(b*
x + a)^2 - 105*(d*x*e + c*e)^2*B*a^4*b^3*c*d^6*g^3*e^3/(b*x + a)^2 + 21*(d*
x*e + c*e)^2*B*a^5*b^2*d^7*g^3*e^3/(b*x + a)^2 + 6*(d*x*e + c*e)^3*B*b^8*c^
5*d*g^3*e^2/(b*x + a)^3 - 30*(d*x*e + c*e)^3*B*a*b^7*c^4*d^2*g^3*e^2/(b*x +
 a)^3 + 60*(d*x*e + c*e)^3*B*a^2*b^6*c^3*d^3*g^3*e^2/(b*x + a)^3 - 60*(d*x*
e + c*e)^3*B*a^3*b^5*c^2*d^4*g^3*e^2/(b*x + a)^3 + 30*(d*x*e + c*e)^3*B*a^4
*b^4*c*d^5*g^3*e^2/(b*x + a)^3 - 6*(d*x*e + c*e)^3*B*a^5*b^3*d^6*g^3*e^2/(b
*x + a)^3)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c -
 a*d)))/(b*d^8*e^4 - 4*(d*x*e + c*e)*b^2*d^7*e^3/(b*x + a) + 6*(d*x*e + c*e
)^2*b^3*d^6*e^2/(b*x + a)^2 - 4*(d*x*e + c*e)^3*b^4*d^5*e/(b*x + a)^3 + (d*
x*e + c*e)^4*b^5*d^4/(b*x + a)^4)
```

maple [B] time = 0.14, size = 2191, normalized size = 14.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] 1/2*b^2*e^2*B*g^3/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a*c^3-e^4*B*g^3*ln(d*e
/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^3*d^3*c+1/4/b*
e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*
a^4*d^4+3/2*b*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)^4*a^2*c^2*d^2-35/2*b^3*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a)
)/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^4/(b*x+a)^4*c^4-b^2*e^4*B*g^3*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^3*a*d-1/4*b^7*e^
4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^
4*c^8/(b*x+a)^4+1/4/b*B*g^3*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^4-e*B
*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^3*c-B*g^3/d*ln(b*(d*e/b-e*(a*d-b*c)/b
/(b*x+a))-d*e)*a^3*c+1/4*b^3*B*g^3/d^4*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d
*e)*c^4+1/4*b^3*e^4*A*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^4-b^2*e^4*A*g^
3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^3*a*d+1/2*b*e^3*B*g^3*d/(-e/(b*x+a)*a*
d+b*e/(b*x+a)*c)^3*a^2*c^2+3/2*b*e^4*A*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4
*a^2*c^2*d^2+3/2*b*e*B*g^3/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^2*c^2-b^2*e*B
*g^3/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*c^3*a+1/4*b^3*e*B*g^3/d^3/(-e/(b*x+
a)*a*d+b*e/(b*x+a)*c)*c^4+1/4*b^3*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))
/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^4+3/2*b*B*g^3/d^2*ln(b*(d*e/b-e*(a*d-b*
c)/b/(b*x+a))-d*e)*a^2*c^2-1/8*b^3*e^2*B*g^3/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a
)*c)^2*c^4-3/4*b*e^2*B*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^2*c^2+2*b^6*e
^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)
^4*c^7/(b*x+a)^4*a-7*b^5*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^2/(-e/
(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^6/(b*x+a)^4*a^2+14*b^4*e^4*B*g^3*ln(d*e/b-e*
(a*d-b*c)/b/(b*x+a))/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^3/(b*x+a)^4*c^5-7
*b*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a
)*c)^4*a^6/(b*x+a)^4*c^2+14*b^2*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d
/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^5/(b*x+a)^4*c^3-1/3*e^3*B*g^3*d^2/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^3*c-e^4*A*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^
4*a^3*d^3*c-1/4/b*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4/(-e/(b*x+a)
*a*d+b*e/(b*x+a)*c)^4*a^8/(b*x+a)^4+2*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x
+a))*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^7/(b*x+a)^4*c-1/3*b^2*e^3*B*g^3
/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a*c^3-1/8/b*e^2*B*g^3*d^2/(-e/(b*x+a)*a*d
+b*e/(b*x+a)*c)^2*a^4+1/12/b*e^3*B*g^3*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3
```

```
*a^4+1/2*e^2*B*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^3*c*d-b^2*B*g^3/d^3*l
n(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a*c^3+1/4/b*e*B*g^3/(-e/(b*x+a)*a*d+
b*e/(b*x+a)*c)*a^4*d+1/12*b^3*e^3*B*g^3/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*
c^4+1/4/b*e^4*A*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^4*d^4
```

maxima [B] time = 1.30, size = 436, normalized size = 2.93

$$\frac{1}{4}Ab^3g^3x^4+Aab^2g^3x^3+\frac{3}{2}Aa^2bg^3x^2+\left(x\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)-\frac{a\log\left(bx+a\right)}{b}+\frac{c\log\left(dx+c\right)}{d}\right)Ba^3g^3+\frac{3}{2}\left(x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(d*e*x/(b
*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b + c*log(d*x + c)/d)*B*a^3*g^3 +
 3/2*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + a^2*log(b*x + a)/b^2 - c^2
*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + 1/2*(2*x^3*log(d*e*x
/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d
^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2
*g^3 + 1/24*(6*x^4*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + 6*a^4*log(b*x + a
)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^
2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^3 + A*a^
3*g^3*x
```

mupad [B] time = 4.69, size = 566, normalized size = 3.80

$$x\left(\frac{(4\,a\,d+4\,b\,c)\left(\frac{\left(\frac{b^2\,g^3\,(16\,A\,a\,d+4\,A\,b\,c-B\,a\,d+B\,b\,c)}{4\,d}-\frac{A\,b^2\,g^3\,(4\,a\,d+4\,b\,c)}{4\,d}\right)(4\,a\,d+4\,b\,c)}{4\,b\,d}-\frac{a\,b\,g^3\,(6\,A\,a\,d+4\,A\,b\,c-B\,a\,d+B\,b\,c)}{d}+\frac{A\,a\,b^2\,c\,g^3}{d}\right)}{4\,b\,d}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x))),x)
```

```
[Out] x*(((4*a*d + 4*b*c)*((((b^2*g^3*(16*A*a*d + 4*A*b*c - B*a*d + B*b*c))/(4*d)
 - (A*b^2*g^3*(4*a*d + 4*b*c))/(4*d))*(4*a*d + 4*b*c))/(4*b*d) - (a*b*g^3*(
6*A*a*d + 4*A*b*c - B*a*d + B*b*c))/d + (A*a*b^2*c*g^3)/d))/(4*b*d) + (a^2*
g^3*(8*A*a*d + 12*A*b*c - 3*B*a*d + 3*B*b*c))/(2*d) - (a*c*((b^2*g^3*(16*A*
a*d + 4*A*b*c - B*a*d + B*b*c))/(4*d) - (A*b^2*g^3*(4*a*d + 4*b*c))/(4*d)))
/(b*d)) - x^2*((((b^2*g^3*(16*A*a*d + 4*A*b*c - B*a*d + B*b*c))/(4*d) - (A*
b^2*g^3*(4*a*d + 4*b*c))/(4*d))*(4*a*d + 4*b*c))/(8*b*d) - (a*b*g^3*(6*A*a*
d + 4*A*b*c - B*a*d + B*b*c))/(2*d) + (A*a*b^2*c*g^3)/(2*d)) + log((e*(c +
d*x))/(a + b*x))*((B*b^3*g^3*x^4)/4 + B*a^3*g^3*x + (3*B*a^2*b*g^3*x^2)/2 +
 B*a*b^2*g^3*x^3) + x^3*((b^2*g^3*(16*A*a*d + 4*A*b*c - B*a*d + B*b*c))/(12
*d) - (A*b^2*g^3*(4*a*d + 4*b*c))/(12*d)) - (log(c + d*x)*(B*b^3*c^4*g^3 -
4*B*a^3*c*d^3*g^3 + 6*B*a^2*b*c^2*d^2*g^3 - 4*B*a*b^2*c^3*d*g^3))/(4*d^4) +
 (A*b^3*g^3*x^4)/4 - (B*a^4*g^3*log(a + b*x))/(4*b)
```

sympy [B] time = 4.35, size = 706, normalized size = 4.74

$$\frac{Ab^3g^3x^4}{4}-\frac{Ba^4g^3\log\left(x+\frac{\frac{Ba^5d^4g^3}{b}+4Ba^4cd^3g^3-6Ba^3bc^2d^2g^3+4Ba^2b^2c^3dg^3-Bab^3c^4g^3}{Ba^4d^4g^3+4Ba^3bcd^3g^3-6Ba^2b^2c^2d^2g^3+4Bab^3c^3dg^3-Bb^4c^4g^3}\right)}{4b}+\frac{Bcg^3\left(2ad-bc\right)\left(2a^2d^2-2abcd+b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b**3*g**3*x**4/4 - B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*b) + B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*d**4) + x**3*(A*a*b**2*g**3 - B*a
*b**2*g**3/12 + B*b**3*c*g**3/(12*d)) + x**2*(3*A*a**2*b*g**3/2 - 3*B*a**2*
b*g**3/8 + B*a*b**2*c*g**3/(2*d) - B*b**3*c**2*g**3/(8*d**2)) + x*(A*a**3*g
**3 - 3*B*a**3*g**3/4 + 3*B*a**2*b*c*g**3/(2*d) - B*a*b**2*c**2*g**3/d**2 +
 B*b**3*c**3*g**3/(4*d**3)) + (B*a**3*g**3*x + 3*B*a**2*b*g**3*x**2/2 + B*a
*b**2*g**3*x**3 + B*b**3*g**3*x**4/4)*log(e*(c + d*x)/(a + b*x))
```

3.175 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right) dx$

Optimal. Leaf size=118

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3b}+\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2x(bc-ad)^2}{3d^2}+\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

```
[Out] -1/3*B*(-a*d+b*c)^2*g^2*x/d^2+1/6*B*(-a*d+b*c)*g^2*(b*x+a)^2/b/d+1/3*B*(-a*
d+b*c)^3*g^2*ln(d*x+c)/b/d^3+1/3*g^2*(b*x+a)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))/
b
```

Rubi [A] time = 0.08, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 43}

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3b}-\frac{Bg^2x(bc-ad)^2}{3d^2}+\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2)/(6*b*d)
+ (B*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3) + (g^2*(a + b*x)^3*(A + B*Lo
g[(e*(c + d*x))/(a + b*x)]))/(3*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b} - \frac{B\int\frac{(-bc+ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b} + \frac{\left(B(bc-ad)g^2\right)\int\frac{(a+bx)^2}{c+dx}\,dx}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b} + \frac{\left(B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{d^2}+\right.}{3b}$$

$$= -\frac{B(bc-ad)^2g^2x}{3d^2} + \frac{B(bc-ad)g^2(a+bx)^2}{6bd} + \frac{B(bc-ad)^3g^2\log(c+}{3bd^3}$$

Mathematica [**A**] time = 0.05, size = 99, normalized size = 0.84

$$\frac{g^2\left(\frac{B(bc-ad)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{2d^3}+(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g^2*((B*(b*c - a*d)*(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c -
 a*d)^2*Log[c + d*x]))/(2*d^3) + (a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a +
b*x)])))/(3*b)
```

fricas [**B**] time = 0.83, size = 223, normalized size = 1.89

$$\frac{2\,Ab^3d^3g^2x^3 - 2\,Ba^3d^3g^2\log(bx+a) + \left(Bb^3cd^2 + (6\,A-B)ab^2d^3\right)g^2x^2 - 2\left(Bb^3c^2d - 3\,Bab^2cd^2 - (3\,A-2\,B)a^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 - 2*B*a^3*d^3*g^2*log(b*x + a) + (B*b^3*c*d^2 + (6
*A - B)*a*b^2*d^3)*g^2*x^2 - 2*(B*b^3*c^2*d - 3*B*a*b^2*c*d^2 - (3*A - 2*B)
*a^2*b*d^3)*g^2*x + 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*l
og(d*x + c) + 2*(B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*
g^2*x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^3)
```

giac [**B**] time = 0.89, size = 2640, normalized size = 22.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] -1/6*(2*B*b^4*c^4*d^3*g^2*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 8*B*a
*b^3*c^3*d^4*g^2*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 12*B*a^2*b^2*c
^2*d^5*g^2*e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 8*B*a^3*b*c*d^6*g^2*
e^4*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 2*B*a^4*d^7*g^2*e^4*log(-d*e +
(d*x*e + c*e)*b/(b*x + a)) - 6*(d*x*e + c*e)*B*b^5*c^4*d^2*g^2*e^3*log(-d*e
 + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 24*(d*x*e + c*e)*B*a*b^4*c^3*d^3*
g^2*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) - 36*(d*x*e + c*e)*
B*a^2*b^3*c^2*d^4*g^2*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) +
```

```
 24*(d*x*e + c*e)*B*a^3*b^2*c*d^5*g^2*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x +
 a))/(b*x + a) - 6*(d*x*e + c*e)*B*a^4*b*d^6*g^2*e^3*log(-d*e + (d*x*e + c*
e)*b/(b*x + a))/(b*x + a) + 6*(d*x*e + c*e)^2*B*b^6*c^4*d*g^2*e^2*log(-d*e
+ (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 - 24*(d*x*e + c*e)^2*B*a*b^5*c^3*d
^2*g^2*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 + 36*(d*x*e +
c*e)^2*B*a^2*b^4*c^2*d^3*g^2*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x
 + a)^2 - 24*(d*x*e + c*e)^2*B*a^3*b^3*c*d^4*g^2*e^2*log(-d*e + (d*x*e + c*
e)*b/(b*x + a))/(b*x + a)^2 + 6*(d*x*e + c*e)^2*B*a^4*b^2*d^5*g^2*e^2*log(-
d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 - 2*(d*x*e + c*e)^3*B*b^7*c^4*
g^2*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 + 8*(d*x*e + c*e)^3
*B*a*b^6*c^3*d*g^2*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 - 12
*(d*x*e + c*e)^3*B*a^2*b^5*c^2*d^2*g^2*e*log(-d*e + (d*x*e + c*e)*b/(b*x +
a))/(b*x + a)^3 + 8*(d*x*e + c*e)^3*B*a^3*b^4*c*d^3*g^2*e*log(-d*e + (d*x*e
 + c*e)*b/(b*x + a))/(b*x + a)^3 - 2*(d*x*e + c*e)^3*B*a^4*b^3*d^4*g^2*e*lo
g(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^3 + 6*(d*x*e + c*e)*B*b^5*c^4
*d^2*g^2*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 24*(d*x*e + c*e)*B*a*
b^4*c^3*d^3*g^2*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a) + 36*(d*x*e + c*
e)*B*a^2*b^3*c^2*d^4*g^2*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 24*(d
*x*e + c*e)*B*a^3*b^2*c*d^5*g^2*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)
+ 6*(d*x*e + c*e)*B*a^4*b*d^6*g^2*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a
) - 6*(d*x*e + c*e)^2*B*b^6*c^4*d*g^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x
 + a)^2 + 24*(d*x*e + c*e)^2*B*a*b^5*c^3*d^2*g^2*e^2*log((d*x*e + c*e)/(b*x
 + a))/(b*x + a)^2 - 36*(d*x*e + c*e)^2*B*a^2*b^4*c^2*d^3*g^2*e^2*log((d*x*
e + c*e)/(b*x + a))/(b*x + a)^2 + 24*(d*x*e + c*e)^2*B*a^3*b^3*c*d^4*g^2*e^
2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 - 6*(d*x*e + c*e)^2*B*a^4*b^2*d^
5*g^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 2*(d*x*e + c*e)^3*B*b^
7*c^4*g^2*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 8*(d*x*e + c*e)^3*B*
a*b^6*c^3*d*g^2*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 + 12*(d*x*e + c*
e)^3*B*a^2*b^5*c^2*d^2*g^2*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 - 8*(
d*x*e + c*e)^3*B*a^3*b^4*c*d^3*g^2*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)
^3 + 2*(d*x*e + c*e)^3*B*a^4*b^3*d^4*g^2*e*log((d*x*e + c*e)/(b*x + a))/(b*
x + a)^3 + 2*A*b^4*c^4*d^3*g^2*e^4 - 3*B*b^4*c^4*d^3*g^2*e^4 - 8*A*a*b^3*c^
3*d^4*g^2*e^4 + 12*B*a*b^3*c^3*d^4*g^2*e^4 + 12*A*a^2*b^2*c^2*d^5*g^2*e^4 -
 18*B*a^2*b^2*c^2*d^5*g^2*e^4 - 8*A*a^3*b*c*d^6*g^2*e^4 + 12*B*a^3*b*c*d^6*
g^2*e^4 + 2*A*a^4*d^7*g^2*e^4 - 3*B*a^4*d^7*g^2*e^4 + 5*(d*x*e + c*e)*B*b^5
*c^4*d^2*g^2*e^3/(b*x + a) - 20*(d*x*e + c*e)*B*a*b^4*c^3*d^3*g^2*e^3/(b*x
+ a) + 30*(d*x*e + c*e)*B*a^2*b^3*c^2*d^4*g^2*e^3/(b*x + a) - 20*(d*x*e + c
*e)*B*a^3*b^2*c*d^5*g^2*e^3/(b*x + a) + 5*(d*x*e + c*e)*B*a^4*b*d^6*g^2*e^3
/(b*x + a) - 2*(d*x*e + c*e)^2*B*b^6*c^4*d*g^2*e^2/(b*x + a)^2 + 8*(d*x*e +
 c*e)^2*B*a*b^5*c^3*d^2*g^2*e^2/(b*x + a)^2 - 12*(d*x*e + c*e)^2*B*a^2*b^4*
c^2*d^3*g^2*e^2/(b*x + a)^2 + 8*(d*x*e + c*e)^2*B*a^3*b^3*c*d^4*g^2*e^2/(b*
x + a)^2 - 2*(d*x*e + c*e)^2*B*a^4*b^2*d^5*g^2*e^2/(b*x + a)^2)*(b*c/((b*c*
e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*d^6*e^3 - 3
*(d*x*e + c*e)*b^2*d^5*e^2/(b*x + a) + 3*(d*x*e + c*e)^2*b^3*d^4*e/(b*x + a
)^2 - (d*x*e + c*e)^3*b^4*d^3/(b*x + a)^3)
```

maple [B] time = 0.19, size = 1537, normalized size = 13.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] -1/6/b*e^2*B*g^2*d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*a^3+e^3*A*g^2/(-1
/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*a^2*c*d^2+1/2*e^2*B*g^2*d/(-1/(b*x+a)*a*d
*e+1/(b*x+a)*b*c*e)^2*a^2*c+1/3*b^2*e^3*B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/
b*e)/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*c^3+b*B*g^2/d^2*ln(-d*e+(1/b*d*e-
(a*d-b*c)/(b*x+a)/b*e)*b)*a*c^2-1/2*b*e^2*B*g^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)
*b*c*e)^2*c^2*a+1/3/b*e*B*g^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)*a^3*d-1/3*
b^2*e*B*g^2/d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)*c^3+1/6*b^2*e^2*B*g^2/d/
```

```
(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*c^3-1/3/b*e^3*A*g^2/(-1/(b*x+a)*a*d*e+
1/(b*x+a)*b*c*e)^3*a^3*d^3+1/3/b*B*g^2*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b
*e)*b)*a^3-b*e^3*A*g^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*a*c^2*d+b*e*B*g
^2/d/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)*a*c^2-1/3/b*e^3*B*g^2*ln(1/b*d*e-(a
*d-b*c)/(b*x+a)/b*e)*d^3/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*a^3+e^3*B*g^2
*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3
*a^2*c-e*B*g^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)*a^2*c+1/3*b^2*e^3*A*g^2/(
-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*c^3-1/3*b^2*B*g^2/d^3*ln(-d*e+(1/b*d*e-
(a*d-b*c)/(b*x+a)/b*e)*b)*c^3-B*g^2/d*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*
e)*b)*a^2*c+5*b*e^3*B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d/(-1/(b*x+a)*a
*d*e+1/(b*x+a)*b*c*e)^3*a^4/(b*x+a)^3*c^2+5*b^3*e^3*B*g^2*ln(1/b*d*e-(a*d-b
*c)/(b*x+a)/b*e)/d/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*a^2/(b*x+a)^3*c^4-2
*b^4*e^3*B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/d^2/(-1/(b*x+a)*a*d*e+1/(b
*x+a)*b*c*e)^3*c^5/(b*x+a)^3*a+1/3*b^5*e^3*B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+
a)/b*e)/d^3/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*c^6/(b*x+a)^3-b*e^3*B*g^2*
ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*c^2*
a*d-20/3*b^2*e^3*B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(-1/(b*x+a)*a*d*e+
1/(b*x+a)*b*c*e)^3*a^3/(b*x+a)^3*c^3-2*e^3*B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+
a)/b*e)*d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^3*a^5/(b*x+a)^3*c+1/3/b*e^3*
B*g^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c
*e)^3*a^6/(b*x+a)^3
```

maxima [**B**] time = 1.16, size = 278, normalized size = 2.36

$$\frac{1}{3}Ab^2g^2x^3+Aabg^2x^2+\left(x\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)-\frac{a\log(bx+a)}{b}+\frac{c\log(dx+c)}{d}\right)Ba^2g^2+\Bigg(x^2\log\Bigg(\frac{dex}{bx+a}+\frac{ce}{bx+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(d*e*x/(b*x + a) + c*e/(b*x + a))
 - a*log(b*x + a)/b + c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(d*e*x/(b*x + a
) + c*e/(b*x + a)) + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a
*d)*x/(b*d))*B*a*b*g^2 + 1/6*(2*x^3*log(d*e*x/(b*x + a) + c*e/(b*x + a)) -
2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2
- 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

mupad [**B**] time = 4.57, size = 290, normalized size = 2.46

$$x^2\left(\frac{b\,g^2\,\left(9\,A\,a\,d+3\,A\,b\,c-B\,a\,d+B\,b\,c\right)}{6\,d}-\frac{A\,b\,g^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,d}\right)-x\Bigg(\frac{\left(3\,a\,d+3\,b\,c\right)\,\Bigg(\frac{b\,g^2\,\left(9\,A\,a\,d+3\,A\,b\,c-B\,a\,d+B\,b\,c\right)}{3\,d}-}{3\,b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x))),x)
```

```
[Out] x^2*((b*g^2*(9*A*a*d + 3*A*b*c - B*a*d + B*b*c))/(6*d) - (A*b*g^2*(3*a*d +
3*b*c))/(6*d)) - x*(((3*a*d + 3*b*c)*((b*g^2*(9*A*a*d + 3*A*b*c - B*a*d + B
*b*c))/(3*d) - (A*b*g^2*(3*a*d + 3*b*c))/(3*d)))/(3*b*d) - (a*g^2*(3*A*a*d
+ 3*A*b*c - B*a*d + B*b*c))/d + (A*a*b*c*g^2)/d) + log((e*(c + d*x))/(a + b
*x))*((B*b^2*g^2*x^3)/3 + B*a^2*g^2*x + B*a*b*g^2*x^2) + (log(c + d*x)*(B*b
^2*c^3*g^2 + 3*B*a^2*c*d^2*g^2 - 3*B*a*b*c^2*d*g^2))/(3*d^3) + (A*b^2*g^2*x
^3)/3 - (B*a^3*g^2*log(a + b*x))/(3*b)
```

sympy [**B**] time = 2.91, size = 491, normalized size = 4.16

$$\frac{Ab^2g^2x^3}{3}-\frac{Ba^3g^2\log\left(x+\frac{\frac{Ba^4d^3g^2}{b}+3Ba^3cd^2g^2-3Ba^2bc^2dg^2+Bab^2c^3g^2}{Ba^3d^3g^2+3Ba^2bcd^2g^2-3Bab^2c^2dg^2+Bb^3c^3g^2}\right)}{3b}+\frac{Bcg^2\left(3a^2d^2-3abcd+b^2c^2\right)\log\Bigg(x+\frac{4Ba^3cd^2g^2-3Ba}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b**2*g**2*x**3/3 - B*a**3*g**2*log(x + (B*a**4*d**3*g**2/b + 3*B*a**3*c*d
**2*g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2)/(B*a**3*d**3*g**2 +
 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**2 + B*b**3*c**3*g**2))/(3*b)
 + B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (4*B*a**3*c*d**2*
g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2 - B*a*c*g**2*(3*a**2*d**
2 - 3*a*b*c*d + b**2*c**2) + B*b*c**2*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*
c**2)/d)/(B*a**3*d**3*g**2 + 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**
2 + B*b**3*c**3*g**2))/(3*d**3) + x**2*(A*a*b*g**2 - B*a*b*g**2/6 + B*b**2*
c*g**2/(6*d)) + x*(A*a**2*g**2 - 2*B*a**2*g**2/3 + B*a*b*c*g**2/d - B*b**2*
c**2*g**2/(3*d**2)) + (B*a**2*g**2*x + B*a*b*g**2*x**2 + B*b**2*g**2*x**3/3
)*log(e*(c + d*x)/(a + b*x))
```

3.176 $\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\,dx$

Optimal. Leaf size=81

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}+\frac{Bgx(bc-ad)}{2d}$$

```
[Out] 1/2*B*(-a*d+b*c)*g*x/d-1/2*B*(-a*d+b*c)^2*g*ln(d*x+c)/b/d^2+1/2*g*(b*x+a)^2
*(A+B*ln(e*(d*x+c)/(b*x+a)))/b
```

Rubi [A] time = 0.05, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}+\frac{Bgx(bc-ad)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (B*(b*c - a*d)*g*x)/(2*d) - (B*(b*c - a*d)^2*g*Log[c + d*x])/(2*b*d^2) + (g
*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b} - \frac{B\int\frac{(bc-ad)g^2(-a-bx)}{c+dx}\,dx}{2bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\frac{-a-bx}{c+dx}\,dx}{2b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\left(-\frac{b}{d}+\frac{bc-ad}{d(c+dx)}\right)}{2b}$$

$$= \frac{B(bc-ad)gx}{2d} - \frac{B(bc-ad)^2g\log(c+dx)}{2bd^2} + \frac{g(a+bx)^2\,(A+B\log}{2b}$$

<u>**Mathematica**</u> **[A]** time = 0.04, size = 69, normalized size = 0.85

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+\frac{B(bc-ad)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g*((B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2 + (a + b*x)^2
*(A + B*Log[(e*(c + d*x))/(a + b*x)])))/(2*b)
```

<u>**fricas**</u> **[A]** time = 0.96, size = 127, normalized size = 1.57

$$\frac{Ab^2d^2gx^2 - Ba^2d^2g\log(bx+a) + \left(Bb^2cd + (2A-B)abd^2\right)gx - \left(Bb^2c^2 - 2\,Babcd\right)g\log(dx+c) + (Bb^2d^2gx^2}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 - B*a^2*d^2*g*log(b*x + a) + (B*b^2*c*d + (2*A - B)*a*
b*d^2)*g*x - (B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^2 +
2*B*a*b*d^2*g*x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^2)
```

<u>**giac**</u> **[B]** time = 0.67, size = 1395, normalized size = 17.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] 1/2*(B*b^3*c^3*d^2*g*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - 3*B*a*b^2*
c^2*d^3*g*e^3*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) + 3*B*a^2*b*c*d^4*g*e^3
*log(-d*e + (d*x*e + c*e)*b/(b*x + a)) - B*a^3*d^5*g*e^3*log(-d*e + (d*x*e
+ c*e)*b/(b*x + a)) - 2*(d*x*e + c*e)*B*b^4*c^3*d*g*e^2*log(-d*e + (d*x*e +
 c*e)*b/(b*x + a))/(b*x + a) + 6*(d*x*e + c*e)*B*a*b^3*c^2*d^2*g*e^2*log(-d
*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) - 6*(d*x*e + c*e)*B*a^2*b^2*c*d^3
*g*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + 2*(d*x*e + c*e)*B*
a^3*b*d^4*g*e^2*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a) + (d*x*e +
c*e)^2*B*b^5*c^3*g*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*x + a)^2 - 3*
(d*x*e + c*e)^2*B*a*b^4*c^2*d*g*e*log(-d*e + (d*x*e + c*e)*b/(b*x + a))/(b*
x + a)^2 + 3*(d*x*e + c*e)^2*B*a^2*b^3*c*d^2*g*e*log(-d*e + (d*x*e + c*e)*b
/(b*x + a))/(b*x + a)^2 - (d*x*e + c*e)^2*B*a^3*b^2*d^3*g*e*log(-d*e + (d*x
```

```
*e + c*e)*b/(b*x + a))/(b*x + a)^2 + 2*(d*x*e + c*e)*B*b^4*c^3*d*g*e^2*log(
(d*x*e + c*e)/(b*x + a))/(b*x + a) - 6*(d*x*e + c*e)*B*a*b^3*c^2*d^2*g*e^2*
log((d*x*e + c*e)/(b*x + a))/(b*x + a) + 6*(d*x*e + c*e)*B*a^2*b^2*c*d^3*g*
e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 2*(d*x*e + c*e)*B*a^3*b*d^4*g*
e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - (d*x*e + c*e)^2*B*b^5*c^3*g*e*
log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 3*(d*x*e + c*e)^2*B*a*b^4*c^2*d*
g*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 - 3*(d*x*e + c*e)^2*B*a^2*b^3*
c*d^2*g*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + (d*x*e + c*e)^2*B*a^3*
b^2*d^3*g*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + A*b^3*c^3*d^2*g*e^3
- B*b^3*c^3*d^2*g*e^3 - 3*A*a*b^2*c^2*d^3*g*e^3 + 3*B*a*b^2*c^2*d^3*g*e^3 +
 3*A*a^2*b*c*d^4*g*e^3 - 3*B*a^2*b*c*d^4*g*e^3 - A*a^3*d^5*g*e^3 + B*a^3*d^
5*g*e^3 + (d*x*e + c*e)*B*b^4*c^3*d*g*e^2/(b*x + a) - 3*(d*x*e + c*e)*B*a*b
^3*c^2*d^2*g*e^2/(b*x + a) + 3*(d*x*e + c*e)*B*a^2*b^2*c*d^3*g*e^2/(b*x + a
) - (d*x*e + c*e)*B*a^3*b*d^4*g*e^2/(b*x + a))*(b*c/((b*c*e - a*d*e)*(b*c -
 a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*d^4*e^2 - 2*(d*x*e + c*e)*b^
2*d^3*e/(b*x + a) + (d*x*e + c*e)^2*b^3*d^2/(b*x + a)^2)
```

maple [B] time = 0.14, size = 951, normalized size = 11.74

$$-\frac{B\,a^4 d^2 e^2 g\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{2\left(-\frac{ade}{bx+a}+\frac{bce}{bx+a}\right)^2(bx+a)^2\,b}+\frac{2B\,a^3 cd\,e^2 g\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{\left(-\frac{ade}{bx+a}+\frac{bce}{bx+a}\right)^2(bx+a)^2}-\frac{3B\,a^2 b\,c^2 e^2 g\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{\left(-\frac{ade}{bx+a}+\frac{bce}{bx+a}\right)^2(bx+a)^2}+\frac{2Ba\,b^2 c^3 e^2 g\ln\left(\frac{de}{b}\right.}{\left(-\frac{ade}{bx+a}+\frac{bce}{bx+a}\right)^2(b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] 1/2/b*e^2*A*g/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*a^2*d^2-e^2*A*g/(-1/(b*x
+a)*a*d*e+1/(b*x+a)*b*c*e)^2*a*d*c+1/2*b*e^2*A*g/(-1/(b*x+a)*a*d*e+1/(b*x+a
)*b*c*e)^2*c^2+1/2/b*B*g*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*a^2-B*g
/d*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*a*c+1/2*b*B*g/d^2*ln(-d*e+(1/
b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*c^2+1/2/b*e*B*g/(-1/(b*x+a)*a*d*e+1/(b*x+a)
*b*c*e)*a^2*d-e*B*g/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)*a*c+1/2*b*e*B*g/d/(-
1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)*c^2+1/2/b*e^2*B*g*ln(1/b*d*e-(a*d-b*c)/(b*
x+a)/b*e)*d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*a^2-e^2*B*g*ln(1/b*d*e-(
a*d-b*c)/(b*x+a)/b*e)*d/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*a*c-1/2/b*e^2*
B*g*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e
)^2*a^4/(b*x+a)^2+2*e^2*B*g*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d/(-1/(b*x+a)
*a*d*e+1/(b*x+a)*b*c*e)^2*a^3/(b*x+a)^2*c-3*b*e^2*B*g*ln(1/b*d*e-(a*d-b*c)/
(b*x+a)/b*e)/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*a^2/(b*x+a)^2*c^2+2*b^2*e
^2*B*g*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/d/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*
e)^2*a/(b*x+a)^2*c^3+1/2*b*e^2*B*g*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(-1/(b
*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*c^2-1/2*b^3*e^2*B*g*ln(1/b*d*e-(a*d-b*c)/(b*
x+a)/b*e)/d^2/(-1/(b*x+a)*a*d*e+1/(b*x+a)*b*c*e)^2*c^4/(b*x+a)^2
```

maxima [A] time = 1.12, size = 143, normalized size = 1.77

$$\frac{1}{2}Abgx^2+\left(x\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)-\frac{a\log(bx+a)}{b}+\frac{c\log(dx+c)}{d}\right)Bag+\frac{1}{2}\left(x^2\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)+\frac{a^2\log}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b
+ c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) +
 a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*B*b*g +
 A*a*g*x
```

mupad [B] time = 4.31, size = 126, normalized size = 1.56

$$x\left(\frac{g\,\left(4\,A\,a\,d+2\,A\,b\,c-B\,a\,d+B\,b\,c\right)}{2\,d}-\frac{A\,g\,\left(2\,a\,d+2\,b\,c\right)}{2\,d}\right)+\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\,\left(\frac{B\,b\,g\,x^2}{2}+B\,a\,g\,x\right)-\frac{\ln\left(c+d\,x\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x))),x)
```

```
[Out] x*((g*(4*A*a*d + 2*A*b*c - B*a*d + B*b*c))/(2*d) - (A*g*(2*a*d + 2*b*c))/(2
*d)) + log((e*(c + d*x))/(a + b*x))*((B*b*g*x^2)/2 + B*a*g*x) - (log(c + d*
x)*(B*b*c^2*g - 2*B*a*c*d*g))/(2*d^2) + (A*b*g*x^2)/2 - (B*a^2*g*log(a + b*
x))/(2*b)
```

sympy [B] time = 1.92, size = 253, normalized size = 3.12

$$\frac{Abgx^2}{2}-\frac{Ba^2g\log\left(x+\frac{\frac{Ba^3d^2g}{b}+2Ba^2cdg-Babc^2g}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{2b}+\frac{Bcg\left(2ad-bc\right)\log\left(x+\frac{3Ba^2cdg-Babc^2g-Bacg(2ad-bc)+\frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{2d^2}+x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b*g*x**2/2 - B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/(2*b) + B*c*g*(2*a*
d - b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B
*b*c**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))
/(2*d**2) + x*(A*a*g - B*a*g/2 + B*b*c*g/(2*d)) + (B*a*g*x + B*b*g*x**2/2)*
log(e*(c + d*x)/(a + b*x))
```

3.177 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=81

$$-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg}-\frac{B\,\mathrm{Li}_2\left(\frac{bc-ad}{d(a+bx)}+1\right)}{bg}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(d*x+c)/(b*x+a)))/b/g-B*polylog(2,1+(-a*
d+b*c)/d/(b*x+a))/b/g
```

Rubi [**A**] time = 0.21, antiderivative size = 122, normalized size of antiderivative = 1.51, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B\,\mathrm{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg}-\frac{B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}+\frac{B\log^2(g(a+bx))}{2bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x),x]
```

```
[Out] (B*Log[g*(a + b*x)]^2)/(2*b*g) - (B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g
+ b*g*x])/(b*g) + ((A + B*Log[(e*(c + d*x))/(a + b*x)])*Log[a*g + b*g*x])/(
b*g) - (B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{ag+bgx}\,dx &= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\log(ag+bgx)}{e(c+dx)}\,dx}{bg}\\
&= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\log(ag+bgx)}{c+dx}\,dx}{beg}\\
&= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int \left(-\frac{be\log(ag+bgx)}{a+bx}+\frac{de\log(ag+bgx)}{c+dx}\right)dx}{beg}\\
&= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg}+\frac{B\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g}-\frac{(Bd)\int \frac{\log(ag+bgx)}{c+dx}\,dx}{bg}\\
&= -\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}+\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg}+B\int \frac{\log (}{ag}\\
&= -\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}+\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg}+\frac{B\,\mathrm{Subst}(}{}\\
&= \frac{B\log^2(g(a+bx))}{2bg}-\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}+\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag}{bg}
\end{aligned}$$

Mathematica [A] time = 0.04, size = 95, normalized size = 1.17

$$\frac{\log(g(a+bx))\left(2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)-B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)+B\log(g(a+bx))\right)-2B\,\mathrm{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)}{2bg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x),x]
```

```
[Out] (Log[g*(a + b*x)]*(B*Log[g*(a + b*x)] + 2*(A - B*Log[(b*(c + d*x))/(b*c - a
*d)] + B*Log[(e*(c + d*x))/(a + b*x)])) - 2*B*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)])/(2*b*g)
```

fricas **[F]** time = 0.77, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B\log\left(\frac{dex+ce}{bx+a}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B*log((d*e*x + c*e)/(b*x + a)) + A)/(b*g*x + a*g), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[B]** time = 0.06, size = 419, normalized size = 5.17

$$-\frac{Bad\ln\left(-\frac{-de+\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)b}{de}\right)\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{(ad-bc)\,bg}+\frac{Bc\ln\left(-\frac{-de+\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)b}{de}\right)\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{(ad-bc)\,g}-\frac{Aad\ln\left(-de+\left(\frac{de}{b}-\right.\right.}{(ad-bc)\,bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x)
```

```
[Out] -1/b/g/(a*d-b*c)*A*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*a*d+1/g/(a*d-
b*c)*A*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*c-1/b/g/(a*d-b*c)*B*dilog
(-(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)/d/e)*a*d+1/g/(a*d-b*c)*B*dilog(-
(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)/d/e)*c-1/b/g/(a*d-b*c)*B*ln(1/b*d*
e-(a*d-b*c)/(b*x+a)/b*e)*ln(-(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)/d/e)*
a*d+1/g/(a*d-b*c)*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*ln(-(-d*e+(1/b*d*e-(a
*d-b*c)/(b*x+a)/b*e)*b)/d/e)*c
```

maxima **[F]** time = 0.00, size = 0, normalized size = 0.00

$$B\left(\frac{\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int-\frac{bdx\log(e)+bc\log(e)-\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^2dgx^2+abcg+\left(b^2cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+ag\right)}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] B*(log(b*x + a)*log(d*x + c)/(b*g) - integrate(-(b*d*x*log(e) + b*c*log(e)
- (2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a
*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(c + d*x))/(a + b*x)))/(a*g + b*g*x), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A}{a+bx}\,dx + \int \frac{B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}{a+bx}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x)
```

```
[Out] (Integral(A/(a + b*x), x) + Integral(B*log(c*e/(a + b*x) + d*e*x/(a + b*x))
/(a + b*x), x))/g
```

3.178 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=64

$$-\frac{A-B}{bg^2(a+bx)}-\frac{B(c+dx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{g^2(a+bx)(bc-ad)}$$

```
[Out] (-A+B)/b/g^2/(b*x+a)-B*(d*x+c)*ln(e*(d*x+c)/(b*x+a))/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [A] time = 0.08, antiderivative size = 101, normalized size of antiderivative = 1.58, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{bg^2(a+bx)}+\frac{Bd\log(a+bx)}{bg^2(bc-ad)}-\frac{Bd\log(c+dx)}{bg^2(bc-ad)}+\frac{B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] B/(b*g^2*(a + b*x)) + (B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (B*d*Log[c +
 d*x])/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(b*g^2*(a
 + b*x))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^2}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)} + \frac{B\int\frac{-bc+ad}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)} - \frac{(B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)} - \frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2} - \frac{bd}{(bc-ad)^2(a+bx)} + \frac{d^2}{(bc-ad)^2(c+dx)}\right)}{bg^2}$$

$$= \frac{B}{bg^2(a+bx)} + \frac{Bd\log(a+bx)}{b(bc-ad)g^2} - \frac{Bd\log(c+dx)}{b(bc-ad)g^2} - \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)}$$

Mathematica [**A**] time = 0.05, size = 86, normalized size = 1.34

$$\frac{-(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A-B\right)-Bd(a+bx)\log(c+dx)+Bd(a+bx)\log(a+bx)}{bg^2(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] (B*d*(a + b*x)*Log[a + b*x] - B*d*(a + b*x)*Log[c + d*x] - (b*c - a*d)*(A -
 B + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^2*(a + b*x))
```

fricas [**A**] time = 1.73, size = 87, normalized size = 1.36

$$-\frac{(A-B)bc-(A-B)ad+(Bbdx+Bbc)\log\left(\frac{dex+ce}{bx+a}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x, algorithm="fricas")
```

```
[Out] -((A - B)*b*c - (A - B)*a*d + (B*b*d*x + B*b*c)*log((d*e*x + c*e)/(b*x + a)
))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d)*g^2)
```

giac [**A**] time = 0.90, size = 126, normalized size = 1.97

$$-\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)\left(\frac{(dxe+ce)B\log\left(\frac{dxe+ce}{bx+a}\right)}{(bx+a)g^2}+\frac{(dxe+ce)(A-B)}{(bx+a)g^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] -(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))*((
d*x*e + c*e)*B*log((d*x*e + c*e)/(b*x + a))/((b*x + a)*g^2) + (d*x*e + c*e)
*(A - B)/((b*x + a)*g^2))
```

maple [**B**] time = 0.05, size = 520, normalized size = 8.12

$$-\frac{B\,a^2d^2\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{(ad-bc)^2\,(bx+a)\,b\,g^2}+\frac{2Bacd\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{(ad-bc)^2\,(bx+a)\,g^2}-\frac{Bb\,c^2\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{(ad-bc)^2\,(bx+a)\,g^2}-\frac{A\,a^2d^2}{(ad-bc)^2\,(bx+a)\,b\,g^2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x)
```

```
[Out] 1/b/(a*d-b*c)^2/g^2*A*d^2*a-1/(a*d-b*c)^2/g^2*A*d*c-1/b/(a*d-b*c)^2/g^2*A/(
b*x+a)*a^2*d^2+2/(a*d-b*c)^2/g^2*A/(b*x+a)*a*d*c-b/(a*d-b*c)^2/g^2*A/(b*x+a
)*c^2+1/b/(a*d-b*c)^2/g^2*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2*a-1/(a*d-
b*c)^2/g^2*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d*c-1/b/(a*d-b*c)^2/g^2*B*ln
(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)*a^2*d^2+2/(a*d-b*c)^2/g^2*B*ln(1/b*
d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)*a*d*c-b/(a*d-b*c)^2/g^2*B*ln(1/b*d*e-(a*
d-b*c)/(b*x+a)/b*e)/(b*x+a)*c^2+1/b/(a*d-b*c)^2/g^2*B/(b*x+a)*a^2*d^2-2/(a*
d-b*c)^2/g^2*B/(b*x+a)*a*d*c+b/(a*d-b*c)^2/g^2*B/(b*x+a)*c^2-1/b/(a*d-b*c)^
2/g^2*B*d^2*a+1/(a*d-b*c)^2/g^2*B*d*c
```

maxima [B] time = 1.07, size = 134, normalized size = 2.09

$$-B\left(\frac{\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)}{b^2g^2x+abg^2}-\frac{1}{b^2g^2x+abg^2}-\frac{d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}+\frac{d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)-\frac{A}{b^2g^2x+abg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x, algorithm="maxima")
```

```
[Out] -B*(log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^2*g^2*x + a*b*g^2) - 1/(b^2*g^2
*x + a*b*g^2) - d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + d*log(d*x + c)/((b^2
*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

mupad [B] time = 5.01, size = 106, normalized size = 1.66

$$-\frac{A-B}{x\,b^2\,g^2+a\,b\,g^2}-\frac{B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)}{b^2\,g^2\,\left(x+\frac{a}{b}\right)}+\frac{B\,d\,\mathrm{atan}\left(\frac{b\,c\,2\mathrm{i}+b\,d\,x\,2\mathrm{i}}{a\,d-b\,c}+1\mathrm{i}\right)\,2\mathrm{i}}{b\,g^2\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))/(a*g + b*g*x)^2,x)
```

```
[Out] (B*d*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*2i)/(b*g^2*(a*d - b*c)) - (
B*log((e*(c + d*x))/(a + b*x)))/(b^2*g^2*(x + a/b)) - (A - B)/(b^2*g^2*x +
a*b*g^2)
```

sympy [B] time = 1.54, size = 231, normalized size = 3.61

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{abg^2+b^2g^2x}+\frac{Bd\log\left(x+\frac{-\frac{Ba^2d^3}{ad-bc}+\frac{2Babcd^2}{ad-bc}+Bad^2-\frac{Bb^2c^2d}{ad-bc}+Bbcd}{2Bbd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{Bd\log\left(x+\frac{\frac{Ba^2d^3}{ad-bc}-\frac{2Babcd^2}{ad-bc}+Bad^2+\frac{Bb^2c^2d}{ad-bc}+Bbcd}{2Bbd^2}\right)}{bg^2\left(ad-bc\right)}+\frac{-A-}{abg^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(a*b*g**2 + b**2*g**2*x) + B*d*log(x + (-B*a*
*2*d**3/(a*d - b*c) + 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 - B*b**2*c**2*d
/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) - B*d*log(x + (B
*a**2*d**3/(a*d - b*c) - 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 + B*b**2*c**
2*d/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) + (-A + B)/(a
*b*g**2 + b**2*g**2*x)
```

3.179 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=144

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}-\frac{Bd}{2bg^3(a+bx)(bc-ad)}+\frac{B}{4bg^3(a+bx)^2}$$

```
[Out] 1/4*B/b/g^3/(b*x+a)^2-1/2*B*d/b/(-a*d+b*c)/g^3/(b*x+a)-1/2*B*d^2*ln(b*x+a)/
b/(-a*d+b*c)^2/g^3+1/2*B*d^2*ln(d*x+c)/b/(-a*d+b*c)^2/g^3+1/2*(-A-B*ln(e*(d
*x+c)/(b*x+a)))/b/g^3/(b*x+a)^2
```

Rubi [A] time = 0.10, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}-\frac{Bd}{2bg^3(a+bx)(bc-ad)}+\frac{B}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] B/(4*b*g^3*(a + b*x)^2) - (B*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Lo
g[a + b*x])/(2*b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*x])/(2*b*(b*c - a*d)
^2*g^3) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(2*b*g^3*(a + b*x)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^3}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{-bc+ad}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{2bg^3}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\Big(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}-}{2bg^3}$$

$$= \frac{B}{4bg^3(a+bx)^2}-\frac{Bd}{2b(bc-ad)g^3(a+bx)}-\frac{Bd^2\log(a+bx)}{2b(bc-ad)^2g^3}+\frac{Bd^2\log(c+dx)}{2b(bc-ad)^2g^3}-$$

Mathematica [**A**] time = 0.10, size = 128, normalized size = 0.89

$$-\frac{(bc-ad)\left(-2aAd+2B(bc-ad)\log\left(\frac{e(c+dx)}{a+bx}\right)+3aBd+2Abc-bBc+2bBdx\right)-2Bd^2(a+bx)^2\log(c+dx)+2B}{4bg^3(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] -1/4*(2*B*d^2*(a + b*x)^2*Log[a + b*x] - 2*B*d^2*(a + b*x)^2*Log[c + d*x] +
 (b*c - a*d)*(2*A*b*c - b*B*c - 2*a*A*d + 3*a*B*d + 2*b*B*d*x + 2*B*(b*c -
a*d)*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)^2*g^3*(a + b*x)^2)
```

fricas [**A**] time = 1.70, size = 221, normalized size = 1.53

$$-\frac{(2A-B)b^2c^2-4(A-B)abcd+(2A-3B)a^2d^2+2\left(Bb^2cd-Babd^2\right)x-2\left(Bb^2d^2x^2+2Babd^2x-Bb^2c^2+2Ba\right.}{4\left(\left(b^5c^2-2ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2a^3b^2cd+a^4bd^2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*A - B)*b^2*c^2 - 4*(A - B)*a*b*c*d + (2*A - 3*B)*a^2*d^2 + 2*(B*b^
2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a
*b*c*d)*log((d*e*x + c*e)/(b*x + a)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2
)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^
2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [**A**] time = 0.86, size = 254, normalized size = 1.76

$$\frac{\left(\frac{4(dxe+ce)Bde\log\left(\frac{dxe+ce}{bx+a}\right)}{bx+a}+\frac{4(dxe+ce)Ade}{bx+a}-\frac{4(dxe+ce)Bde}{bx+a}-\frac{2(dxe+ce)^2Bb\log\left(\frac{dxe+ce}{bx+a}\right)}{(bx+a)^2}-\frac{2(dxe+ce)^2Ab}{(bx+a)^2}+\frac{(dxe+ce)^2Bb}{(bx+a)^2}\right)\Big(\frac{bc}{(bce-ade)(bc-ad)}}{4\left(bcg^3e-adg^3e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] 1/4*(4*(d*x*e + c*e)*B*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a) + 4*(d*x*
e + c*e)*A*d*e/(b*x + a) - 4*(d*x*e + c*e)*B*d*e/(b*x + a) - 2*(d*x*e + c*e
)^2*B*b*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 - 2*(d*x*e + c*e)^2*A*b/(b
*x + a)^2 + (d*x*e + c*e)^2*B*b/(b*x + a)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a
*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b*c*g^3*e - a*d*g^3*e)
```

maple [B] time = 0.05, size = 753, normalized size = 5.23

$$-\frac{B\,a^3d^3\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{2\,(ad-bc)^3\,(bx+a)^2\,b\,g^3}+\frac{3B\,a^2c\,d^2\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{2\,(ad-bc)^3\,(bx+a)^2\,g^3}-\frac{3Bab\,c^2d\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{2\,(ad-bc)^3\,(bx+a)^2\,g^3}+\frac{B\,b^2c^3\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{2\,(ad-bc)^3\,(bx+a)^2\,g^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2/b/(a*d-b*c)^3/g^3*A/(b*x+a)^2*a^3*d^3+1/2/b/(a*d-b*c)^3/g^3*B*ln(1/b*d
*e-(a*d-b*c)/(b*x+a)/b*e)*d^3*a-1/2/(a*d-b*c)^3/g^3*B*ln(1/b*d*e-(a*d-b*c)/
(b*x+a)/b*e)*d^2*c+1/4/b/(a*d-b*c)^3/g^3*B/(b*x+a)^2*a^3*d^3+1/2/b/(a*d-b*c
)^3/g^3*B*d^3/(b*x+a)*a^2+1/2*b^2/(a*d-b*c)^3/g^3*B*ln(1/b*d*e-(a*d-b*c)/(b
*x+a)/b*e)/(b*x+a)^2*c^3+1/2*b/(a*d-b*c)^3/g^3*B*d/(b*x+a)*c^2-3/2*b/(a*d-b
*c)^3/g^3*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^2*a*d*c^2+3/2/(a*d-b*
c)^3/g^3*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^2*a^2*d^2*c+1/2/b/(a*d
-b*c)^3/g^3*A*d^3*a-1/2/(a*d-b*c)^3/g^3*A*d^2*c-3/4/b/(a*d-b*c)^3/g^3*B*d^3
*a+3/4/(a*d-b*c)^3/g^3*B*d^2*c-1/4*b^2/(a*d-b*c)^3/g^3*B/(b*x+a)^2*c^3+1/2*
b^2/(a*d-b*c)^3/g^3*A/(b*x+a)^2*c^3+3/2/(a*d-b*c)^3/g^3*A/(b*x+a)^2*a^2*d^2
*c-3/2*b/(a*d-b*c)^3/g^3*A/(b*x+a)^2*a*d*c^2-1/(a*d-b*c)^3/g^3*B*d^2/(b*x+a
)*c*a-3/4/(a*d-b*c)^3/g^3*B/(b*x+a)^2*a^2*d^2*c+3/4*b/(a*d-b*c)^3/g^3*B/(b*
x+a)^2*c^2*a*d-1/2/b/(a*d-b*c)^3/g^3*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b
*x+a)^2*a^3*d^3
```

maxima [A] time = 1.28, size = 255, normalized size = 1.77

$$-\frac{1}{4}\,B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}+\frac{2\,\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)}{b^3g^3x^2+2\,ab^2g^3x+a^2bg^3}+\frac{2\,d^2\,\mathrm{l}}{\left(b^3c^2-2\,a\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x, algorithm="maxima")
```

```
[Out] -1/4*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a
^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*log(d*e*x/(b*x + a) + c*e/
(b*x + a))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/(
(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2
*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*
g^3)
```

mupad [B] time = 5.19, size = 208, normalized size = 1.44

$$\frac{B\,d^2\,\mathrm{atanh}\left(\frac{2\,b^3\,c^2\,g^3-2\,a^2\,b\,d^2\,g^3}{2\,b\,g^3\,(a\,d-b\,c)^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{b\,g^3\,(a\,d-b\,c)^2}-\frac{B\,\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)}{2\,b^2\,g^3\,\left(2\,a\,x+b\,x^2+\frac{a^2}{b}\right)}-\frac{\frac{2\,A\,a\,d-2\,A\,b\,c-3\,B\,a\,d+B\,b\,c}{2\,(a\,d-b\,c)}-\frac{B\,b\,d\,x}{a\,d-b\,c}}{2\,a^2\,b\,g^3+4\,a\,b^2\,g^3\,x+2\,b^3\,g^3\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))/(a*g + b*g*x)^3,x)
```

```
[Out] (B*d^2*atanh((2*b^3*c^2*g^3 - 2*a^2*b*d^2*g^3)/(2*b*g^3*(a*d - b*c)^2) - (2
*b*d*x)/(a*d - b*c)))/(b*g^3*(a*d - b*c)^2) - (B*log((e*(c + d*x))/(a + b*x
)))/(2*b^2*g^3*(2*a*x + b*x^2 + a^2/b)) - ((2*A*a*d - 2*A*b*c - 3*B*a*d + B
*b*c)/(2*(a*d - b*c)) - (B*b*d*x)/(a*d - b*c))/(2*a^2*b*g^3 + 2*b^3*g^3*x^2
 + 4*a*b^2*g^3*x)
```

sympy [**B**] time = 2.68, size = 422, normalized size = 2.93

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}+\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{2bg^3\,(ad-bc)^2}-\frac{Bd^2\log\left(x+\frac{\frac{Ba^3d^5}{(ad-bc)^2}-}{}\right.}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b**3*g**
3*x**2) + B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*d**4/(
a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b**3*c**
3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2)
 - B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d - b*
c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d**2/(
a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + (-2*A
*a*d + 2*A*b*c + 3*B*a*d - B*b*c + 2*B*b*d*x)/(4*a**3*b*d*g**3 - 4*a**2*b**
2*c*g**3 + x**2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 -
 8*a*b**3*c*g**3))
```

3.180 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=175

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{3bg^4(a+bx)^3}+\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}+\frac{}{9b}$$

```
[Out] 1/9*B/b/g^4/(b*x+a)^3-1/6*B*d/b/(-a*d+b*c)/g^4/(b*x+a)^2+1/3*B*d^2/b/(-a*d+
b*c)^2/g^4/(b*x+a)+1/3*B*d^3*ln(b*x+a)/b/(-a*d+b*c)^3/g^4-1/3*B*d^3*ln(d*x+
c)/b/(-a*d+b*c)^3/g^4+1/3*(-A-B*ln(e*(d*x+c)/(b*x+a)))/b/g^4/(b*x+a)^3
```

Rubi [A] time = 0.13, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{3bg^4(a+bx)^3}+\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}+\frac{}{9b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^4,x]
```

```
[Out] B/(9*b*g^4*(a + b*x)^3) - (B*d)/(6*b*(b*c - a*d)*g^4*(a + b*x)^2) + (B*d^2)
/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (B*d^3*Log[a + b*x])/(3*b*(b*c - a*d)^
3*g^4) - (B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(c +
d*x))/(a + b*x)])/(3*b*g^4*(a + b*x)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^4}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bg^4(a+bx)^3} + \frac{B\int \frac{-bc+ad}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bg^4(a+bx)^3} - \frac{(B(bc-ad))\int \frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bg^4(a+bx)^3} - \frac{(B(bc-ad))\int \left(\frac{b}{(bc-ad)(a+bx)^4} - \frac{bd}{(bc-ad)^2(a+bx)^3} + \frac{bd^2}{(bc-ad)^3(a+bx)^2} -}{3bg^4}$$

$$= \frac{B}{9bg^4(a+bx)^3} - \frac{Bd}{6b(bc-ad)g^4(a+bx)^2} + \frac{Bd^2}{3b(bc-ad)^2g^4(a+bx)} + \frac{Bd^3\log(a+bx)}{3b(bc-ad)^3g^4}$$

Mathematica [**A**] time = 0.14, size = 141, normalized size = 0.81

$$\frac{\frac{B\left((bc-ad)\left(11a^2d^2+abd(15dx-7c)+b^2\left(2c^2-3cdx+6d^2x^2\right)\right)-6d^3(a+bx)^3\log(c+dx)+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3} - 6\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{18bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^4,x]
```

```
[Out] ((B*((b*c - a*d)*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x
 + 6*d^2*x^2)) + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c +
 d*x]))/(b*c - a*d)^3 - 6*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(18*b*g^4*(
a + b*x)^3)
```

fricas [**B**] time = 1.12, size = 412, normalized size = 2.35

$$-\frac{2\,(3\,A-B)b^3c^3 - 9\,(2\,A-B)ab^2c^2d + 18\,(A-B)a^2bcd^2 - (6\,A-11\,B)a^3d^3 - 6\left(Bb^3cd^2 - Bab^2d^3\right)x^2 + 3\,\left(Bb^3c^2}{18\left(\left(b^7c^3 - 3\,ab^6c^2d + 3\,a^2b^5cd^2 - a^3b^4d^3\right)g^4x^3 + 3\left(ab^6c^3 - 3\,a^2b^5c^2d + 3\,a^3b^4cd^2 - a^4b^3d^3\right)g^4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x, algorithm="fricas")
```

```
[Out] -1/18*(2*(3*A - B)*b^3*c^3 - 9*(2*A - B)*a*b^2*c^2*d + 18*(A - B)*a^2*b*c*d
^2 - (6*A - 11*B)*a^3*d^3 - 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 + 3*(B*b^3*c^
2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 6*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3
*x^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log
((d*e*x + c*e)/(b*x + a)))/((b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4
*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^
5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b
*d^3)*g^4)
```

giac [**B**] time = 1.06, size = 382, normalized size = 2.18

$$-\frac{\left(\frac{18\,(dxe+ce)Bd^2e^2\log\left(\frac{dxe+ce}{bx+a}\right)}{bx+a} - \frac{18\,(dxe+ce)^2Bbde\log\left(\frac{dxe+ce}{bx+a}\right)}{(bx+a)^2} + \frac{18\,(dxe+ce)Ad^2e^2}{bx+a} - \frac{18\,(dxe+ce)Bd^2e^2}{bx+a} - \frac{18\,(dxe+ce)^2Abde}{(bx+a)^2} + \frac{9\,(dxe+ce)^2Bb}{(bx+a)^2}}{18\left(b^2c^2g^4e^2 - 2\,abcdg^4e^2 + a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] -1/18*(18*(d*x*e + c*e)*B*d^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a) -
18*(d*x*e + c*e)^2*B*b*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 18*(d
*x*e + c*e)*A*d^2*e^2/(b*x + a) - 18*(d*x*e + c*e)*B*d^2*e^2/(b*x + a) - 18
*(d*x*e + c*e)^2*A*b*d*e/(b*x + a)^2 + 9*(d*x*e + c*e)^2*B*b*d*e/(b*x + a)^
2 + 6*(d*x*e + c*e)^3*B*b^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 + 6*(d
*x*e + c*e)^3*A*b^2/(b*x + a)^3 - 2*(d*x*e + c*e)^3*B*b^2/(b*x + a)^3)*(b*c
/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^2*c^
2*g^4*e^2 - 2*a*b*c*d*g^4*e^2 + a^2*d^2*g^4*e^2)
```

maple [**B**]   time = 0.05, size = 1012, normalized size = 5.78

$$-\frac{B\,a^4d^4\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{3\,(ad-bc)^4\,(bx+a)^3\,b\,g^4}+\frac{4B\,a^3c\,d^3\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{3\,(ad-bc)^4\,(bx+a)^3\,g^4}-\frac{2B\,a^2b\,c^2d^2\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)}{(ad-bc)^4\,(bx+a)^3\,g^4}+\frac{4Ba\,b^2c^3d\ln\left(\frac{de}{b}-\frac{(ad-}{(bx+}\right.}{3\,(ad-bc)^4\,(bx+a)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x)
```

```
[Out] 1/3/b/(a*d-b*c)^4/g^4*A*d^4*a+4/3/(a*d-b*c)^4/g^4*B*ln(1/b*d*e-(a*d-b*c)/(b
*x+a)/b*e)/(b*x+a)^3*a^3*d^3*c-1/3/b/(a*d-b*c)^4/g^4*B*ln(1/b*d*e-(a*d-b*c)
/(b*x+a)/b*e)/(b*x+a)^3*a^4*d^4+1/2*b/(a*d-b*c)^4/g^4*B*d^2/(b*x+a)^2*c^2*a
-4/9*b^2/(a*d-b*c)^4/g^4*B/(b*x+a)^3*c^3*a*d-1/3/(a*d-b*c)^4/g^4*B*ln(1/b*d
*e-(a*d-b*c)/(b*x+a)/b*e)*d^3*c-1/3*b^3/(a*d-b*c)^4/g^4*A/(b*x+a)^3*c^4+1/9
*b^3/(a*d-b*c)^4/g^4*B/(b*x+a)^3*c^4+2/3*b/(a*d-b*c)^4/g^4*B/(b*x+a)^3*a^2*
d^2*c^2-2*b/(a*d-b*c)^4/g^4*A/(b*x+a)^3*a^2*d^2*c^2+4/3*b^2/(a*d-b*c)^4/g^4
*A/(b*x+a)^3*a*d*c^3+11/18/(a*d-b*c)^4/g^4*B*d^3*c+1/9/b/(a*d-b*c)^4/g^4*B/
(b*x+a)^3*a^4*d^4-1/3/b/(a*d-b*c)^4/g^4*A/(b*x+a)^3*a^4*d^4+1/3*b/(a*d-b*c)
^4/g^4*B*d^2/(b*x+a)*c^2+1/6/b/(a*d-b*c)^4/g^4*B*d^4/(b*x+a)^2*a^3-1/6*b^2/
(a*d-b*c)^4/g^4*B*d/(b*x+a)^2*c^3+1/3/b/(a*d-b*c)^4/g^4*B*d^4/(b*x+a)*a^2+4
/3/(a*d-b*c)^4/g^4*A/(b*x+a)^3*a^3*d^3*c+1/3/b/(a*d-b*c)^4/g^4*B*ln(1/b*d*e
-(a*d-b*c)/(b*x+a)/b*e)*d^4*a-1/3*b^3/(a*d-b*c)^4/g^4*B*ln(1/b*d*e-(a*d-b*c
)/(b*x+a)/b*e)/(b*x+a)^3*c^4-4/9/(a*d-b*c)^4/g^4*B/(b*x+a)^3*a^3*d^3*c-2/3/
(a*d-b*c)^4/g^4*B*d^3/(b*x+a)*c*a-1/2/(a*d-b*c)^4/g^4*B*d^3/(b*x+a)^2*a^2*c
-1/3/(a*d-b*c)^4/g^4*A*d^3*c-11/18/b/(a*d-b*c)^4/g^4*B*d^4*a-2*b/(a*d-b*c)^
4/g^4*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*a^2*d^2*c^2+4/3*b^2/(a*
d-b*c)^4/g^4*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*c^3*a*d
```

maxima [**B**]   time = 1.37, size = 428, normalized size = 2.45

$$\frac{1}{18}\,B\left(\frac{6\,b^2d^2x^2+2\,b^2c^2-7\,abcd+11\,a^2d^2-3\left(b^2cd-5\,abd^2\right)x}{\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)g^4x^3+3\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\left(a^2b^4c^2-2\,a^3b^3cd+a^4b^2d^2\right)g^4x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x, algorithm="maxima")
```

```
[Out] 1/18*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2
 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) - 6*log
(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^
2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d
 + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^
2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

mupad [**B**]   time = 5.88, size = 339, normalized size = 1.94

$$\frac{B\,b\,c^2}{9\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{A\,b\,c^2}{3\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{B\,\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)}{3\,b\,g^4\,(a+b\,x)^3}-\frac{A\,a^2\,d^2}{3\,b\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}+\frac{1}{18\,b\,g^4\,(a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))/(a*g + b*g*x)^4,x)
```

```
[Out] (B*d^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*2i)/(3*b*g^4*(a*d - b
*c)^3) - (B*log((e*(c + d*x))/(a + b*x)))/(3*b*g^4*(a + b*x)^3) - (A*b*c^2)
/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) + (B*b*c^2)/(9*g^4*(a*d - b*c)^2*(a + b*
x)^3) - (A*a^2*d^2)/(3*b*g^4*(a*d - b*c)^2*(a + b*x)^3) + (11*B*a^2*d^2)/(1
8*b*g^4*(a*d - b*c)^2*(a + b*x)^3) + (5*B*a*d^2*x)/(6*g^4*(a*d - b*c)^2*(a
+ b*x)^3) + (B*b*d^2*x^2)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) + (2*A*a*c*d)/(
3*g^4*(a*d - b*c)^2*(a + b*x)^3) - (7*B*a*c*d)/(18*g^4*(a*d - b*c)^2*(a + b
*x)^3) - (B*b*c*d*x)/(6*g^4*(a*d - b*c)^2*(a + b*x)^3)
```

sympy [B] time = 4.06, size = 656, normalized size = 3.75

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}+\frac{Bd^3\log\left(x+\frac{-\frac{Ba^4d^7}{(ad-bc)^3}+\frac{4Ba^3bcd^6}{(ad-bc)^3}-\frac{6Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{4Bab^3c^3d^4}{(ad-bc)^3}+Bad^4-\frac{Bb^4c^4d^3}{(ad-bc)^3}+Bbcd^3}{2Bbd^4}\right)}{3bg^4(ad-bc)^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9*a*b**
3*g**4*x**2 + 3*b**4*g**4*x**3) + B*d**3*log(x + (-B*a**4*d**7/(a*d - b*c)*
*3 + 4*B*a**3*b*c*d**6/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5/(a*d - b*c)
**3 + 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + B*a*d**4 - B*b**4*c**4*d**3/(a*
d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) - B*d**3*
log(x + (B*a**4*d**7/(a*d - b*c)**3 - 4*B*a**3*b*c*d**6/(a*d - b*c)**3 + 6*
B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3
+ B*a*d**4 + B*b**4*c**4*d**3/(a*d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3
*b*g**4*(a*d - b*c)**3) + (-6*A*a**2*d**2 + 12*A*a*b*c*d - 6*A*b**2*c**2 +
11*B*a**2*d**2 - 7*B*a*b*c*d + 2*B*b**2*c**2 + 6*B*b**2*d**2*x**2 + x*(15*B
*a*b*d**2 - 3*B*b**2*c*d))/(18*a**5*b*d**2*g**4 - 36*a**4*b**2*c*d*g**4 + 1
8*a**3*b**3*c**2*g**4 + x**3*(18*a**2*b**4*d**2*g**4 - 36*a*b**5*c*d*g**4 +
 18*b**6*c**2*g**4) + x**2*(54*a**3*b**3*d**2*g**4 - 108*a**2*b**4*c*d*g**4
 + 54*a*b**5*c**2*g**4) + x*(54*a**4*b**2*d**2*g**4 - 108*a**3*b**3*c*d*g**
4 + 54*a**2*b**4*c**2*g**4))
```

3.181 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=206

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}-\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}-$$

```
[Out] 1/16*B/b/g^5/(b*x+a)^4-1/12*B*d/b/(-a*d+b*c)/g^5/(b*x+a)^3+1/8*B*d^2/b/(-a*
d+b*c)^2/g^5/(b*x+a)^2-1/4*B*d^3/b/(-a*d+b*c)^3/g^5/(b*x+a)-1/4*B*d^4*ln(b*
x+a)/b/(-a*d+b*c)^4/g^5+1/4*B*d^4*ln(d*x+c)/b/(-a*d+b*c)^4/g^5+1/4*(-A-B*ln
(e*(d*x+c)/(b*x+a)))/b/g^5/(b*x+a)^4
```

Rubi [A] time = 0.15, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}-\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] B/(16*b*g^5*(a + b*x)^4) - (B*d)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3) + (B*d^
2)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3)/(4*b*(b*c - a*d)^3*g^5*(a
+ b*x)) - (B*d^4*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x
])/(4*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(4*b*g^5*
(a + b*x)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^5}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4bg^5(a+bx)^4} + \frac{B\int \frac{-bc+ad}{g^4(a+bx)^5(c+dx)}\,dx}{4bg} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4bg^5(a+bx)^4} - \frac{(B(bc-ad))\int \frac{1}{(a+bx)^5(c+dx)}\,dx}{4bg^5} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4bg^5(a+bx)^4} - \frac{(B(bc-ad))\int \Bigg(\frac{b}{(bc-ad)(a+bx)^5} - \frac{bd}{(bc-ad)^2(a+bx)^4} + \frac{bd^2}{(bc-ad)^3(a+bx)^3} -}{4bg^5} \\
&= \frac{B}{16bg^5(a+bx)^4} - \frac{Bd}{12b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2}{8b(bc-ad)^2g^5(a+bx)^2} - \frac{Bd^3}{4b(bc-ad)^3g}
\end{aligned}
$$

Mathematica [**A**] time = 0.19, size = 166, normalized size = 0.81

$$
\frac{\frac{B(ad-bc)\left(\frac{12d^3(bc-ad)}{a+bx}-\frac{6d^2(bc-ad)^2}{(a+bx)^2}+\frac{4d(bc-ad)^3}{(a+bx)^3}-\frac{3(bc-ad)^4}{(a+bx)^4}+12d^4\log(a+bx)-12d^4\log(c+dx)\right)}{12(bc-ad)^5}-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{(a+bx)^4}}{4bg^5}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] ((B*(-(b*c) + a*d)*((-3*(b*c - a*d)^4)/(a + b*x)^4 + (4*d*(b*c - a*d)^3)/(a
 + b*x)^3 - (6*d^2*(b*c - a*d)^2)/(a + b*x)^2 + (12*d^3*(b*c - a*d))/(a + b
*x) + 12*d^4*Log[a + b*x] - 12*d^4*Log[c + d*x]))/(12*(b*c - a*d)^5) - (A +
 B*Log[(e*(c + d*x))/(a + b*x)])/(a + b*x)^4)/(4*b*g^5)
```

fricas [**B**] time = 0.92, size = 637, normalized size = 3.09

$$
-\frac{3\,(4\,A-B)b^4c^4-16\,(3\,A-B)ab^3c^3d+36\,(2\,A-B)a^2b^2c^2d^2-48\,(A-B)a^3bcd^3+(12\,A-25\,B)a^4d^4+12\,\big(Bb^4}{48\,\Big(\big(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\big)g^5x^4+4\,\big(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6c^2d}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x, algorithm="fricas")
```

```
[Out] -1/48*(3*(4*A - B)*b^4*c^4 - 16*(3*A - B)*a*b^3*c^3*d + 36*(2*A - B)*a^2*b^
2*c^2*d^2 - 48*(A - B)*a^3*b*c*d^3 + (12*A - 25*B)*a^4*d^4 + 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 + 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 12*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*
B*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3
*b*c*d^3)*log((d*e*x + c*e)/(b*x + a)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b
^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*
b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*
(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*
b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4
*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^
6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

giac [**B**] time = 1.39, size = 511, normalized size = 2.48

$$
\frac{\left(\frac{48\,(dxe+ce)Bd^3e^3\log\left(\frac{dxe+ce}{bx+a}\right)}{bx+a}-\frac{72\,(dxe+ce)^2Bbd^2e^2\log\left(\frac{dxe+ce}{bx+a}\right)}{(bx+a)^2}+\frac{48\,(dxe+ce)^3Bb^2de\log\left(\frac{dxe+ce}{bx+a}\right)}{(bx+a)^3}+\frac{48\,(dxe+ce)Ad^3e^3}{bx+a}-\frac{48\,(dxe+ce)Bd^3e^3}{bx+a}-\right.}{48\,\big(b^3c}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] 1/48*(48*(d*x*e + c*e)*B*d^3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 7
2*(d*x*e + c*e)^2*B*b*d^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 48
*(d*x*e + c*e)^3*B*b^2*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^3 + 48*(d
*x*e + c*e)*A*d^3*e^3/(b*x + a) - 48*(d*x*e + c*e)*B*d^3*e^3/(b*x + a) - 72
*(d*x*e + c*e)^2*A*b*d^2*e^2/(b*x + a)^2 + 36*(d*x*e + c*e)^2*B*b*d^2*e^2/(
b*x + a)^2 + 48*(d*x*e + c*e)^3*A*b^2*d*e/(b*x + a)^3 - 16*(d*x*e + c*e)^3*
B*b^2*d*e/(b*x + a)^3 - 12*(d*x*e + c*e)^4*B*b^3*log((d*x*e + c*e)/(b*x + a
))/(b*x + a)^4 - 12*(d*x*e + c*e)^4*A*b^3/(b*x + a)^4 + 3*(d*x*e + c*e)^4*B
*b^3/(b*x + a)^4)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)
*(b*c - a*d)))/(b^3*c^3*g^5*e^3 - 3*a*b^2*c^2*d*g^5*e^3 + 3*a^2*b*c*d^2*g^5
*e^3 - a^3*d^3*g^5*e^3)
```

maple [B] time = 0.06, size = 1306, normalized size = 6.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x)
```

```
[Out] -5/4*b^3/(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a*d*
c^4+5/4/(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^4*d
^4*c-1/4/b/(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^
5*d^5-1/3*b^2/(a*d-b*c)^5/g^5*B*d^2/(b*x+a)^3*c^3*a-5/8*b^2/(a*d-b*c)^5/g^5
*B/(b*x+a)^4*a^2*d^2*c^3+5/16*b^3/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a*d*c^4-1/4/(
a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^4*c-1/16*b^4/(a*d-b*c)
^5/g^5*B/(b*x+a)^4*c^5+1/4*b^4/(a*d-b*c)^5/g^5*A/(b*x+a)^4*c^5+5/2*b^2/(a*d
-b*c)^5/g^5*A/(b*x+a)^4*a^2*d^2*c^3+3/8*b/(a*d-b*c)^5/g^5*B*d^3/(b*x+a)^2*c
^2*a+5/8*b/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^3*d^3*c^2-5/4*b^3/(a*d-b*c)^5/g^5*
A/(b*x+a)^4*c^4*a*d+1/2*b/(a*d-b*c)^5/g^5*B*d^3/(b*x+a)^3*a^2*c^2-5/2*b/(a*
d-b*c)^5/g^5*A/(b*x+a)^4*a^3*d^3*c^2+1/4/b/(a*d-b*c)^5/g^5*A*d^5*a-1/4/(a*d
-b*c)^5/g^5*A*d^4*c-25/48/b/(a*d-b*c)^5/g^5*B*d^5*a+25/48/(a*d-b*c)^5/g^5*B
*d^4*c-1/4/b/(a*d-b*c)^5/g^5*A/(b*x+a)^4*a^5*d^5+1/8/b/(a*d-b*c)^5/g^5*B*d^
5/(b*x+a)^2*a^3+1/12*b^3/(a*d-b*c)^5/g^5*B*d/(b*x+a)^3*c^4+1/4/b/(a*d-b*c)^
5/g^5*B*d^5/(b*x+a)*a^2-5/16/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^4*d^4*c+5/2*b^2/
(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^2*d^2*c^3-5
/2*b/(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^3*d^3*
c^2+1/16/b/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^5*d^5-1/8*b^2/(a*d-b*c)^5/g^5*B*d^
2/(b*x+a)^2*c^3+1/12/b/(a*d-b*c)^5/g^5*B*d^5/(b*x+a)^3*a^4+5/4/(a*d-b*c)^5/
g^5*A/(b*x+a)^4*a^4*d^4*c+1/4/b/(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x
+a)/b*e)*d^5*a+1/4*b^4/(a*d-b*c)^5/g^5*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/
(b*x+a)^4*c^5-3/8/(a*d-b*c)^5/g^5*B*d^4/(b*x+a)^2*a^2*c-1/2/(a*d-b*c)^5/g^5
*B*d^4/(b*x+a)*a*c-1/3/(a*d-b*c)^5/g^5*B*d^4/(b*x+a)^3*a^3*c+1/4*b/(a*d-b*c
)^5/g^5*B*d^3/(b*x+a)*c^2
```

maxima [B] time = 1.51, size = 647, normalized size = 3.14

$$-\frac{1}{48} B \left(\frac{12\, b^3 d^3 x^3 - 3\, b^3 c^3 + 13\, a b^2 c^2 d - 23\, a^2 b}{\left(b^8 c^3 - 3\, a b^7 c^2 d + 3\, a^2 b^6 c d^2 - a^3 b^5 d^3\right) g^5 x^4 + 4\, \left(a b^7 c^3 - 3\, a^2 b^6 c^2 d + 3\, a^3 b^5 c d^2 - a^4 b^4 d^3\right) g^5 x^3 + 6\, \left(a^2 b^6\right.} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x, algorithm="maxima")
```

```
[Out] -1/48*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25
*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
```

```
 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3
)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)
*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3
)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^
5) + 12*log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/(
(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)
*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

mupad [B] time = 6.62, size = 578, normalized size = 2.81

$$\frac{B\,d^4\,\mathrm{atanh}\Bigg(\frac{-4\,a^4\,b\,d^4\,g^5+8\,a^3\,b^2\,c\,d^3\,g^5-8\,a\,b^4\,c^3\,d\,g^5+4\,b^5\,c^4\,g^5}{4\,b\,g^5\,{\left(a\,d-b\,c\right)}^4}-\frac{2\,b\,d\,x\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}{{\left(a\,d-b\,c\right)}^4}\Bigg)}{2\,b\,g^5\,{\left(a\,d-b\,c\right)}^4}-\frac{B\,\ln\Bigg(}{4\,b^2\,g^5\,\Bigg(4\,a^3\,x+\frac{a^4}{b}+b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))/(a*g + b*g*x)^5,x)
```

```
[Out] (B*d^4*atanh((4*b^5*c^4*g^5 - 4*a^4*b*d^4*g^5 - 8*a*b^4*c^3*d*g^5 + 8*a^3*b
^2*c*d^3*g^5)/(4*b*g^5*(a*d - b*c)^4) - (2*b*d*x*(a^3*d^3 - b^3*c^3 + 3*a*b
^2*c^2*d - 3*a^2*b*c*d^2))/(a*d - b*c)^4))/(2*b*g^5*(a*d - b*c)^4) - (B*log
((e*(c + d*x))/(a + b*x)))/(4*b^2*g^5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*
x^2 + 4*a*b^2*x^3)) - ((12*A*a^3*d^3 - 12*A*b^3*c^3 - 25*B*a^3*d^3 + 3*B*b^
3*c^3 + 36*A*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 13*B*a*b^2*c^2*d + 23*B*a^2*b
*c*d^2)/(12*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d^2*x^2
*(B*b^3*c - 7*B*a*b^2*d))/(2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c
*d^2)) - (d*x*(B*b^3*c^2 + 13*B*a^2*b*d^2 - 5*B*a*b^2*c*d))/(3*(a^3*d^3 - b
^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (B*b^3*d^3*x^3)/(a^3*d^3 - b^3*c
^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))/(4*a^4*b*g^5 + 4*b^5*g^5*x^4 + 16*a^3*
b^2*g^5*x + 16*a*b^4*g^5*x^3 + 24*a^2*b^3*g^5*x^2)
```

sympy [B] time = 5.53, size = 944, normalized size = 4.58

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4a^4bg^5+16a^3b^2g^5x+24a^2b^3g^5x^2+16ab^4g^5x^3+4b^5g^5x^4}+\frac{Bd^4\log\Bigg(x+\frac{-\frac{Ba^5d^9}{(ad-bc)^4}+\frac{5Ba^4bcd^8}{(ad-bc)^4}-\frac{10Ba^3b^2c^2d^7}{(ad-bc)^4}+\frac{10Ba^2b^3c^3d^6}{(ad-bc)^4}-}{2Bbd^5}}{4bg^5\,(ad-bc)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x + 24*a**
2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) + B*d**4*log(x +
 (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10*B*a**
3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4 -
 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a*d - b
*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) - B*d**4*log(x
 + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 10*B*a*
*3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4
+ 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(a*d -
b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) + (-12*A*a**3
*d**3 + 36*A*a**2*b*c*d**2 - 36*A*a*b**2*c**2*d + 12*A*b**3*c**3 + 25*B*a**
3*d**3 - 23*B*a**2*b*c*d**2 + 13*B*a*b**2*c**2*d - 3*B*b**3*c**3 + 12*B*b**
3*d**3*x**3 + x**2*(42*B*a*b**2*d**3 - 6*B*b**3*c*d**2) + x*(52*B*a**2*b*d*
*3 - 20*B*a*b**2*c*d**2 + 4*B*b**3*c**2*d))/(48*a**7*b*d**3*g**5 - 144*a**6
```

```
*b**2*c*d**2*g**5 + 144*a**5*b**3*c**2*d*g**5 - 48*a**4*b**4*c**3*g**5 + x*
*4*(48*a**3*b**5*d**3*g**5 - 144*a**2*b**6*c*d**2*g**5 + 144*a*b**7*c**2*d*
g**5 - 48*b**8*c**3*g**5) + x**3*(192*a**4*b**4*d**3*g**5 - 576*a**3*b**5*c
*d**2*g**5 + 576*a**2*b**6*c**2*d*g**5 - 192*a*b**7*c**3*g**5) + x**2*(288*
a**5*b**3*d**3*g**5 - 864*a**4*b**4*c*d**2*g**5 + 864*a**3*b**5*c**2*d*g**5
 - 288*a**2*b**6*c**3*g**5) + x*(192*a**6*b**2*d**3*g**5 - 576*a**5*b**3*c*
d**2*g**5 + 576*a**4*b**4*c**2*d*g**5 - 192*a**3*b**5*c**3*g**5))
```

3.182 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx$

Optimal. Leaf size=503

$$-\frac{2Bg^4(bc-ad)^5\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5bd^5}-\frac{2Bg^4(c+dx)(bc-ad)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5d^5}+\frac{Bg^4(a+b}{}$$

```
[Out] 13/30*B^2*(-a*d+b*c)^4*g^4*x/d^4-7/60*B^2*(-a*d+b*c)^3*g^4*(b*x+a)^2/b/d^3+
1/30*B^2*(-a*d+b*c)^2*g^4*(b*x+a)^3/b/d^2-5/6*B^2*(-a*d+b*c)^5*g^4*ln(b*x+a
)/b/d^5-13/30*B^2*(-a*d+b*c)^5*g^4*ln((d*x+c)/(b*x+a))/b/d^5+1/5*B*(-a*d+b*
c)^3*g^4*(b*x+a)^2*(A+B*ln(e*(d*x+c)/(b*x+a)))/b/d^3-2/15*B*(-a*d+b*c)^2*g^
4*(b*x+a)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))/b/d^2+1/10*B*(-a*d+b*c)*g^4*(b*x+a)
^4*(A+B*ln(e*(d*x+c)/(b*x+a)))/b/d-2/5*B*(-a*d+b*c)^4*g^4*(d*x+c)*(A+B*ln(e
*(d*x+c)/(b*x+a)))/d^5+1/5*g^4*(b*x+a)^5*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b-2/
5*B*(-a*d+b*c)^5*g^4*(A+B*ln(e*(d*x+c)/(b*x+a)))*ln(1-d*(b*x+a)/b/(d*x+c))/
b/d^5+2/5*B^2*(-a*d+b*c)^5*g^4*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^5
```

Rubi [A] time = 0.82, antiderivative size = 557, normalized size of antiderivative = 1.11, number of steps used = 28, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}+\frac{2Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5bd^5}+\frac{Bg^4(a+bx)^2(bc-ad)^3\left(}{5bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (13*B^2*(b*c - a*d)^4*g^4*x)/(30*d^4
) - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g
^4*(a + b*x)^3)/(30*b*d^2) - (5*B^2*(b*c - a*d)^5*g^4*Log[c + d*x])/(6*b*d^
5) + (2*B^2*(b*c - a*d)^5*g^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x
])/(5*b*d^5) - (B^2*(b*c - a*d)^5*g^4*Log[c + d*x]^2)/(5*b*d^5) - (2*B^2*(b
*c - a*d)^4*g^4*(a + b*x)*Log[(e*(c + d*x))/(a + b*x)])/(5*b*d^4) + (B*(b*c
 - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(5*b*d^3) -
 (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(
15*b*d^2) + (B*(b*c - a*d)*g^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*
x)]))/(10*b*d) + (2*B*(b*c - a*d)^5*g^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x
))/(a + b*x)]))/(5*b*d^5) + (g^4*(a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a +
b*x)])^2)/(5*b) + (2*B^2*(b*c - a*d)^5*g^4*PolyLog[2, (b*(c + d*x))/(b*c -
a*d)])/(5*b*d^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b}-\frac{(2B)\int\frac{(bc-ad)g^5(a+bx)^4\big(-A-B\log\big(}{c+dx}}{5bg}\\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b}-\frac{\left(2B(bc-ad)g^4\right)\int\frac{(a+bx)^4\big(-A-}{c+}}{5b}\\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b}-\frac{\left(2B(bc-ad)g^4\right)\int\Big(-\frac{b(bc-ad)^3\big(}{}}{}\\
&= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b}-\frac{\left(2B(bc-ad)g^4\right)\int(a+bx)^3\big(-}{5d}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}+\frac{B(bc-ad)^3g^4(a+bx)^2\Big(A+B\log\Big(\frac{e(c+dx)}{a+bx}\Big)\Big)}{5bd^3}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}-\frac{2B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{5bd^4}+\frac{B(b}{}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}-\frac{2B^2(bc-ad)^5g^4\log(c+dx)}{5bd^5}-\frac{2B^2(bc-ad)}{}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}+\frac{13B^2(bc-ad)^4g^4x}{30d^4}-\frac{7B^2(bc-ad)^3g^4(a+b}{60bd^3}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}+\frac{13B^2(bc-ad)^4g^4x}{30d^4}-\frac{7B^2(bc-ad)^3g^4(a+b}{60bd^3}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}+\frac{13B^2(bc-ad)^4g^4x}{30d^4}-\frac{7B^2(bc-ad)^3g^4(a+b}{60bd^3}\\
&= -\frac{2AB(bc-ad)^4g^4x}{5d^4}+\frac{13B^2(bc-ad)^4g^4x}{30d^4}-\frac{7B^2(bc-ad)^3g^4(a+b}{60bd^3}
\end{aligned}
$$

Mathematica [A] time = 0.51, size = 512, normalized size = 1.02

$$
\frac{g^4\Bigg((a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2-\frac{B(bc-ad)\big(-6d^4(a+bx)^4\big(B\log\big(\frac{e(c+dx)}{a+bx}\big)+A\big)+8d^3(a+bx)^3(bc-ad)\big(B\log\big(\frac{e(c+dx)}{a+bx}\big)+A\big)-12d^2(a+bx)^2(b}{}}{}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 - (B*(b*c - a*d)*(
24*A*b*d*(b*c - a*d)^3*x + 24*B*(b*c - a*d)^4*Log[a + b*x] - 4*B*(b*c - a*d
)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x])
- B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 +
 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) - 12*B*(b*c - a*d)^3*(b*
d*x + (-(b*c) + a*d)*Log[c + d*x]) + 24*b*B*(b*c - a*d)^3*(c + d*x)*Log[(e*
(c + d*x))/(a + b*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(c +
 d*x))/(a + b*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(c + d*x))
/(a + b*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 24*
(b*c - a*d)^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 12*B*(b*c
 - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12*d^5)))/(5*b)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\bigg(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \Big(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((d*e*x + c*e)/(b
*x + a))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x
^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log((d*e*x + c*e)/(b*x + a)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 2.20, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^{4} \left(B\ln\left(\frac{\left(dx + c\right)e}{bx + a}\right) + A\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

maxima [B] time = 2.53, size = 2395, normalized size = 4.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b +
 c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)
) + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*A*B*
a^3*b*g^4 + 2*(2*x^3*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x +
 a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 1/3*(6*x^4*log(d*e*x/(b*x + a) + c
*e/(b*x + a)) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c
*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^
3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/30*(12*x^5*log(d*e*x/(b*x + a) + c*e/(b*
x + a)) - 12*a^5*log(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (3*(b^4*c*d^3
 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*
b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 + A^2*a^4*g^4
*x + 1/30*((12*g^4*log(e) - 25*g^4)*b^4*c^5 - (60*g^4*log(e) - 113*g^4)*a*b
^3*c^4*d + 4*(30*g^4*log(e) - 49*g^4)*a^2*b^2*c^3*d^2 - 12*(10*g^4*log(e) -
 13*g^4)*a^3*b*c^2*d^3 + 12*(5*g^4*log(e) - 4*g^4)*a^4*c*d^4)*B^2*log(d*x +
 c)/d^5 - 2/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 1
0*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x + a)*log(
(b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*
d^5) + 1/60*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 + 6*(b^5*c*d^4*g^4*log(e) + (1
0*g^4*log(e)^2 - g^4*log(e))*a*b^4*d^5)*B^2*x^4 - 2*((4*g^4*log(e) - g^4)*b
^5*c^2*d^3 - 2*(10*g^4*log(e) - g^4)*a*b^4*c*d^4 - (60*g^4*log(e)^2 - 16*g^
4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 + ((12*g^4*log(e) - 7*g^4)*b^5*c^3*d^2
 - 3*(20*g^4*log(e) - 9*g^4)*a*b^4*c^2*d^3 + 3*(40*g^4*log(e) - 11*g^4)*a^2
*b^3*c*d^4 + (120*g^4*log(e)^2 - 72*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^2*x
^2 - 2*((12*g^4*log(e) - 13*g^4)*b^5*c^4*d - (60*g^4*log(e) - 59*g^4)*a*b^4
*c^3*d^2 + 6*(20*g^4*log(e) - 17*g^4)*a^2*b^3*c^2*d^3 - (120*g^4*log(e) - 7
9*g^4)*a^3*b^2*c*d^4 - (30*g^4*log(e)^2 - 48*g^4*log(e) + 23*g^4)*a^4*b*d^5
)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^
3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x + B^2*a^
5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 10*
a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 - 2*(12*B^2*b^
5*d^5*g^4*x^5*log(e) + 3*(b^5*c*d^4*g^4 + (20*g^4*log(e) - g^4)*a*b^4*d^5)*
B^2*x^4 - 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - 2*(15*g^4*log(e) - 2*g^4
)*a^2*b^3*d^5)*B^2*x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*
b^3*c*d^4*g^4 + 2*(10*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 12*(b^5*c^
4*d*g^4 - 5*a*b^4*c^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g
^4 - (5*g^4*log(e) - 4*g^4)*a^4*b*d^5)*B^2*x - (12*a*b^4*c^4*d*g^4 - 54*a^2
*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 - (12*g^4*lo
g(e) - 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) + 2*(12*B^2*b^5*d^5*g^4*x^5*log(e
) + 3*(b^5*c*d^4*g^4 + (20*g^4*log(e) - g^4)*a*b^4*d^5)*B^2*x^4 - 4*(b^5*c^
2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - 2*(15*g^4*log(e) - 2*g^4)*a^2*b^3*d^5)*B^2*
x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 + 2*(
10*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 12*(b^5*c^4*d*g^4 - 5*a*b^4*c
^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g^4 - (5*g^4*log(e)
- 4*g^4)*a^4*b*d^5)*B^2*x - 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)^4\,{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(c + d*x))/(a + b*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^4*(A + B*log((e*(c + d*x))/(a + b*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

3.183 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx$

Optimal. Leaf size=420

$$\frac{Bg^3(bc-ad)^4\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bd^4}+\frac{Bg^3(c+dx)(bc-ad)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2d^4}-\frac{Bg^3(a+bx)^2(}{}$$

```
[Out] -5/12*B^2*(-a*d+b*c)^3*g^3*x/d^3+1/12*B^2*(-a*d+b*c)^2*g^3*(b*x+a)^2/b/d^2+
11/12*B^2*(-a*d+b*c)^4*g^3*ln(b*x+a)/b/d^4+5/12*B^2*(-a*d+b*c)^4*g^3*ln((d*
x+c)/(b*x+a))/b/d^4-1/4*B*(-a*d+b*c)^2*g^3*(b*x+a)^2*(A+B*ln(e*(d*x+c)/(b*x
+a)))/b/d^2+1/6*B*(-a*d+b*c)*g^3*(b*x+a)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))/b/d+
1/2*B*(-a*d+b*c)^3*g^3*(d*x+c)*(A+B*ln(e*(d*x+c)/(b*x+a)))/d^4+1/4*g^3*(b*x
+a)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b+1/2*B*(-a*d+b*c)^4*g^3*(A+B*ln(e*(d*x
+c)/(b*x+a)))*ln(1-d*(b*x+a)/b/(d*x+c))/b/d^4-1/2*B^2*(-a*d+b*c)^4*g^3*poly
log(2,d*(b*x+a)/b/(d*x+c))/b/d^4
```

Rubi [**A**] time = 0.65, antiderivative size = 474, normalized size of antiderivative = 1.13, number of steps used = 24, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bd^4}-\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bd^4}-\frac{Bg^3(a+bx)^2(bc-ad)^2\left(\right.}{4bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (5*B^2*(b*c - a*d)^3*g^3*x)/(12*d^3) +
(B^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/(12*b*d^2) + (11*B^2*(b*c - a*d)^4*g^3*
Log[c + d*x])/(12*b*d^4) - (B^2*(b*c - a*d)^4*g^3*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(2*b*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[c + d*x]^2)/(
4*b*d^4) + (B^2*(b*c - a*d)^3*g^3*(a + b*x)*Log[(e*(c + d*x))/(a + b*x)])/(
2*b*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b
*x)]))/(4*b*d^2) + (B*(b*c - a*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/
(a + b*x)]))/(6*b*d) - (B*(b*c - a*d)^4*g^3*Log[c + d*x]*(A + B*Log[(e*(c +
 d*x))/(a + b*x)]))/(2*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(
a + b*x)])^2)/(4*b) - (B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c + d*x))/(b*c
- a*d)])/(2*b*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{B\int \frac{(bc-ad)g^4(a+bx)^3\left(-A-B\log\left(\frac{e(c+}{a+}\right.\right.}{c+dx}}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3\left(-A-B\,\mathrm{l}\right.}{c+d}}{2b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2\left(-A-\right.}{d}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int(a+bx)^2\left(-\right.}{2d}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4bd^2} +$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} + \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bd^3} - \frac{B(bc-}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} + \frac{B^2(bc-ad)^4g^3\log(c+dx)}{2bd^4} + \frac{B^2(bc-ad)^3g^3(a}{2}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} +$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} +$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} +$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} +$$

Mathematica [A] time = 0.35, size = 392, normalized size = 0.93

$$g^3\left(\frac{B(bc-ad)\left(2d^3(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+3d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)-6(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+6Abdx(bc-ad)^2-B(b\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(b*c - a*d)*(
6*A*b*d*(b*c - a*d)^2*x + 6*B*(b*c - a*d)^3*Log[a + b*x] - B*(b*c - a*d)*(2
*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) - 3*B*
(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 6*b*B*(b*c - a*d)^2*(
c + d*x)*Log[(e*(c + d*x))/(a + b*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A
 + B*Log[(e*(c + d*x))/(a + b*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(c + d
*x))/(a + b*x)]) - 6*(b*c - a*d)^3*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a
 + b*x)]) - 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
 + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4))
)/(4*b)
```

fricas [F] time = 0.71, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log((d*e*x + c*e)/(b*x + a))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^
3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((d*e*x + c*e)/(b*x + a)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.98, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{3} \left(B\ln\left(\frac{(dx+c)\,e}{bx+a}\right)+A\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [B] time = 2.16, size = 1735, normalized size = 4.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b + c*log(d*x + c)/d)*A*B
*a^3*g^3 + 3*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + a^2*log(b*x + a)/b
^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3 + (2*x^3*log
(d*e*x/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x
```

```
+ c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A
*B*a*b^2*g^3 + 1/12*(6*x^4*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + 6*a^4*log
(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*
g^3 + A^2*a^3*g^3*x - 1/12*((6*g^3*log(e) - 11*g^3)*b^3*c^4 - 2*(12*g^3*log
(e) - 19*g^3)*a*b^2*c^3*d + 9*(4*g^3*log(e) - 5*g^3)*a^2*b*c^2*d^2 - 6*(4*g
^3*log(e) - 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 1/2*(b^4*c^4*g^3 - 4*a
*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d^4*g^3)*(
log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
 - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 2*(b^4*c*d^3
*g^3*log(e) + (6*g^3*log(e)^2 - g^3*log(e))*a*b^3*d^4)*B^2*x^3 - ((3*g^3*lo
g(e) - g^3)*b^4*c^2*d^2 - 2*(6*g^3*log(e) - g^3)*a*b^3*c*d^3 - (18*g^3*log(
e)^2 - 9*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 + ((6*g^3*log(e) - 5*g^3)*b
^4*c^3*d - (24*g^3*log(e) - 17*g^3)*a*b^3*c^2*d^2 + (36*g^3*log(e) - 19*g^3
)*a^2*b^2*c*d^3 + (12*g^3*log(e)^2 - 18*g^3*log(e) + 7*g^3)*a^3*b*d^4)*B^2*
x + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a)^2 + 3*(B^2*b^
4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2
*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3
 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 - (6*B^2*b^4*d^4*g^3*x^4*log(e) +
 2*(b^4*c*d^3*g^3 + (12*g^3*log(e) - g^3)*a*b^3*d^4)*B^2*x^3 - 3*(b^4*c^2*d
^2*g^3 - 4*a*b^3*c*d^3*g^3 - 3*(4*g^3*log(e) - g^3)*a^2*b^2*d^4)*B^2*x^2 +
6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 + (4*g^3*log(e
) - 3*g^3)*a^3*b*d^4)*B^2*x + (6*a*b^3*c^3*d*g^3 - 21*a^2*b^2*c^2*d^2*g^3 +
 26*a^3*b*c*d^3*g^3 + (6*g^3*log(e) - 11*g^3)*a^4*d^4)*B^2)*log(b*x + a) +
(6*B^2*b^4*d^4*g^3*x^4*log(e) + 2*(b^4*c*d^3*g^3 + (12*g^3*log(e) - g^3)*a*
b^3*d^4)*B^2*x^3 - 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 - 3*(4*g^3*log(e)
 - g^3)*a^2*b^2*d^4)*B^2*x^2 + 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a
^2*b^2*c*d^3*g^3 + (4*g^3*log(e) - 3*g^3)*a^3*b*d^4)*B^2*x - 6*(B^2*b^4*d^4
*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*
b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c))/(b*d^4)
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g + b g x\right)^3 \left(A + B \ln\left(\frac{e\,(c + d\,x)}{a + b\,x}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x)))^2, x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

3.184 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx$

Optimal. Leaf size=335

$$-\frac{2Bg^2(bc-ad)^3\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bd^3}-\frac{2Bg^2(c+dx)(bc-ad)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3d^3}+\frac{Bg^2(a}{}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g^2*x/d^2-B^2*(-a*d+b*c)^3*g^2*ln(b*x+a)/b/d^3-1/3*B^2
*(-a*d+b*c)^3*g^2*ln((d*x+c)/(b*x+a))/b/d^3+1/3*B*(-a*d+b*c)*g^2*(b*x+a)^2*
(A+B*ln(e*(d*x+c)/(b*x+a)))/b/d-2/3*B*(-a*d+b*c)^2*g^2*(d*x+c)*(A+B*ln(e*(d
*x+c)/(b*x+a)))/d^3+1/3*g^2*(b*x+a)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b-2/3*B
*(-a*d+b*c)^3*g^2*(A+B*ln(e*(d*x+c)/(b*x+a)))*ln(1-d*(b*x+a)/b/(d*x+c))/b/d
^3+2/3*B^2*(-a*d+b*c)^3*g^2*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^3
```

Rubi [A] time = 0.56, antiderivative size = 389, normalized size of antiderivative = 1.16, number of steps used = 20, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}+\frac{2Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bd^3}-\frac{2ABg^2x(bc-ad)^2}{3d^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) -
(B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*Log
[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (B^2*(b*c - a*d)^3
*g^2*Log[c + d*x]^2)/(3*b*d^3) - (2*B^2*(b*c - a*d)^2*g^2*(a + b*x)*Log[(e*
(c + d*x))/(a + b*x)])/(3*b*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Lo
g[(e*(c + d*x))/(a + b*x)]))/(3*b*d) + (2*B*(b*c - a*d)^3*g^2*Log[c + d*x]*
(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*d^3) + (g^2*(a + b*x)^3*(A + B*L
og[(e*(c + d*x))/(a + b*x)])^2)/(3*b) + (2*B^2*(b*c - a*d)^3*g^2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{(2B)\int\frac{(bc-ad)g^3(a+bx)^2\big(-A-B}{c+dx}}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\frac{(a+bx)^2\big(-}{}}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\Big(-\frac{b(bc-a}{}}{}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int(a+bx)}{3}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B(bc-ad)g^2(a+bx)^2\Big(A+B\log\Big(\frac{e(c+dx)}{a+bx}}{3bd}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} - \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bd^2} + $$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} - \frac{2B^2(bc-ad)^3g^2\log(c+dx)}{3bd^3} - \frac{2B^2(bc-}{}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c}{bd^3}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c}{bd^3}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c}{bd^3}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c}{bd^3}$$

Mathematica [A] time = 0.24, size = 290, normalized size = 0.87

$$\frac{g^2\Bigg((a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2 - \frac{B(bc-ad)\Big(-d^2(a+bx)^2\Big(B\log\Big(\frac{e(c+dx)}{a+bx}\Big)+A\Big)-2(bc-ad)^2\log(c+dx)\Big(B\log\Big(\frac{e(c+dx)}{a+bx}\Big)+A\Big)+2Abdx(bc-}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 - (B*(b*c - a*d)*(
2*A*b*d*(b*c - a*d)*x + 2*B*(b*c - a*d)^2*Log[a + b*x] - B*(b*c - a*d)*(b*d
```

```
*x + (-(b*c) + a*d)*Log[c + d*x]) + 2*b*B*(b*c - a*d)*(c + d*x)*Log[(e*(c +
 d*x))/(a + b*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]) -
2*(b*c - a*d)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - B*(b*c
- a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(3*b)
```

fricas [**F**] time = 1.02, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{dex+ce}{bx+a}\right)^2 + 2\,\big(ABb^2g^2x^2 +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((d*e*x + c*e)/(b*x + a))^2 + 2*(A*B*b
^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((d*e*x + c*e)/(b*x + a)), x
)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**F**] time = 1.81, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^{2} \left(B\ln\left(\frac{(dx+c)\,e}{bx+a}\right)+A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [**B**] time = 2.09, size = 1172, normalized size = 3.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(d*e*x/(b*x + a) + c*e/(b*x
 + a)) - a*log(b*x + a)/b + c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log(d*e*
x/(b*x + a) + c*e/(b*x + a)) + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
+ (b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 1/3*(2*x^3*log(d*e*x/(b*x + a) + c*e/(
b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 + A^2*a^2*g^2
*x + 1/3*((2*g^2*log(e) - 3*g^2)*b^2*c^3 - (6*g^2*log(e) - 7*g^2)*a*b*c^2*d
 + 2*(3*g^2*log(e) - 2*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*
g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x + a)*lo
g((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(
b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 + (b^3*c*d^2*g^2*log(e) + (3*g^2
```

```
*log(e)^2 - g^2*log(e))*a*b^2*d^3)*B^2*x^2 - ((2*g^2*log(e) - g^2)*b^3*c^2*
d - 2*(3*g^2*log(e) - g^2)*a*b^2*c*d^2 - (3*g^2*log(e)^2 - 4*g^2*log(e) + g
^2)*a^2*b*d^3)*B^2*x + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B
^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + (B^2*b^3*d^3*g^2*x^3
 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^3*c^3*g^2 - 3*a*b^2
*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 - (2*B^2*b^3*d^3*g^2*x^
3*log(e) + (b^3*c*d^2*g^2 + (6*g^2*log(e) - g^2)*a*b^2*d^3)*B^2*x^2 - 2*(b^
3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 - (3*g^2*log(e) - 2*g^2)*a^2*b*d^3)*B^2*x -
 (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 - (2*g^2*log(e) - 3*g^2)*a^3*d^3)*B
^2)*log(b*x + a) + (2*B^2*b^3*d^3*g^2*x^3*log(e) + (b^3*c*d^2*g^2 + (6*g^2*
log(e) - g^2)*a*b^2*d^3)*B^2*x^2 - 2*(b^3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 - (
3*g^2*log(e) - 2*g^2)*a^2*b*d^3)*B^2*x - 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b
^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a))*log
(d*x + c))/(b*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g + b g x\right)^2 \left(A + B \ln\left(\frac{e\,(c + d\,x)}{a + b\,x}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

3.185 $\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\,dx$

Optimal. Leaf size=202

$$\frac{Bg(bc-ad)^2\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bd^2}+\frac{Bg(c+dx)(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{d^2}+\frac{g(a+bx)^2\left(B\log\right.}{2}$$

```
[Out] B^2*(-a*d+b*c)^2*g*ln(b*x+a)/b/d^2+B*(-a*d+b*c)*g*(d*x+c)*(A+B*ln(e*(d*x+c)
/(b*x+a)))/d^2+1/2*g*(b*x+a)^2*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b+B*(-a*d+b*c)
^2*g*(A+B*ln(e*(d*x+c)/(b*x+a)))*ln(1-d*(b*x+a)/b/(d*x+c))/b/d^2-B^2*(-a*d+
b*c)^2*g*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^2
```

Rubi [A] time = 0.42, antiderivative size = 284, normalized size of antiderivative = 1.41, number of steps used = 16, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}-\frac{Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)*g*x)/d + (B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) - (B^2
*(b*c - a*d)^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^2) +
(B^2*(b*c - a*d)^2*g*Log[c + d*x]^2)/(2*b*d^2) + (B^2*(b*c - a*d)*g*(a + b*
x)*Log[(e*(c + d*x))/(a + b*x)])/(b*d) - (B*(b*c - a*d)^2*g*Log[c + d*x]*(A
 + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*d^2) + (g*(a + b*x)^2*(A + B*Log[(e*
(c + d*x))/(a + b*x)])^2)/(2*b) - (B^2*(b*c - a*d)^2*g*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])/(b*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{B\int \frac{(bc-ad)g^2(a+bx)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right.}{c+dx}}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int \frac{(a+bx)\left(-A-B\log\left(\frac{e(}{a}\right.\right.}{c+dx}}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx}{a+bx}\right.\right.}{d}\right.}{}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int\left(-A-B\log\left(\frac{e(}{a}\right.\right.}{d}$$

$$= \frac{AB(bc-ad)gx}{d} - \frac{B(bc-ad)^2g\log(c+dx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bd^2} + $$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{bd} - \frac{B(bc-ad)^2g}{}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2g\log(c+dx)}{bd^2} + \frac{B^2(bc-ad)g(a+bx)}{bd}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2g\log(c+dx)}{bd^2} + \frac{B^2(bc-ad)g(a+bx)}{bd}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{B^2(bc-ad)^2g\log\left(-\right.}{bd}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{B^2(bc-ad)^2g\log\left(-\right.}{bd}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{B^2(bc-ad)^2g\log\left(-\right.}{bd}$$

Mathematica [A] time = 0.18, size = 203, normalized size = 1.00

$$\frac{g\left(\frac{B(bc-ad)\left(-2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+2bB(c+dx)\log\left(\frac{e(c+dx)}{a+bx}\right)-B(bc-ad)\left(2\text{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2B(\right.}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(b*c - a*d)*(2*
A*b*d*x + 2*B*(b*c - a*d)*Log[a + b*x] + 2*b*B*(c + d*x)*Log[(e*(c + d*x))/
(a + b*x)] - 2*(b*c - a*d)*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]
) - B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^2))/(2*b)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{dex+ce}{bx+a}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{dex+ce}{bx+a}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d*e*x + c*e)/(b*x
 + a))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((d*e*x + c*e)/(b*x + a)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.53, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)\left(B\ln\left(\frac{(dx+c)\,e}{bx+a}\right)+A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)*(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [B] time = 1.97, size = 619, normalized size = 3.06

$$\frac{1}{2}A^{2}bgx^{2}+2\left(x\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)-\frac{a\log\left(bx+a\right)}{b}+\frac{c\log\left(dx+c\right)}{d}\right)ABag+\Bigg(x^{2}\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a
)/b + c*log(d*x + c)/d)*A*B*a*g + (x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))
 + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*A*B*b
*g + A^2*a*g*x - ((g*log(e) - g)*b*c^2 - (2*g*log(e) - g)*a*c*d)*B^2*log(d*
x + c)/d^2 + (b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b*x + a)*log((b*d*x
 + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^2) +
 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(b^2*c*d*g*log(e) + (g*log(e)^2 - g*lo
g(e))*a*b*d^2)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2
*g)*log(b*x + a)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x - (b^2*c^2*g -
2*a*b*c*d*g)*B^2)*log(d*x + c)^2 - 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(
e) - g)*a*b*d^2 + b^2*c*d*g)*B^2*x + ((g*log(e) - g)*a^2*d^2 + a*b*c*d*g)*B
^2)*log(b*x + a) + 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(e) - g)*a*b*d^2
+ b^2*c*d*g)*B^2*x - (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g
)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

3.186 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=128

$$-\frac{2B\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{bg}+\frac{2B^2\text{Li}_3\left(\frac{b(c+dx)}{d(a+bx)}\right)}{bg}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b/g-2*B*(A+B*ln(e*(d
*x+c)/(b*x+a)))*polylog(2,b*(d*x+c)/d/(b*x+a))/b/g+2*B^2*polylog(3,b*(d*x+c
)/d/(b*x+a))/b/g
```

Rubi [B] time = 4.42, antiderivative size = 719, normalized size of antiderivative = 5.62, number of steps used = 47, number of rules used = 24, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.750, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6691, 6741, 6742, 2499, 2302, 30, 2396, 2433, 2374, 6589, 2500, 2440, 2434, 2375, 2317}

$$-\frac{2AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{2B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(c+dx)}{a+bx}\right)+\log\left(\frac{1}{a+bx}\right)+\log(c+dx)\right)}{bg}-2B^2\text{Pol}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x),x]
```

```
[Out] (A*B*Log[g*(a + b*x)]^2)/(b*g) + (B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (B^2*Lo
g[(a + b*x)^(-1)]^2*Log[c + d*x])/(b*g) - (2*B^2*Log[(a + b*x)^(-1)]*Log[g*
(a + b*x)]*Log[c + d*x])/(b*g) - (B^2*Log[g*(a + b*x)]^2*Log[c + d*x])/(b*g
) + (B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]^2)/(b*g) - (B^2*Log
[g*(a + b*x)]*Log[c + d*x]^2)/(b*g) + (B^2*Log[(a + b*x)^(-1)]^2*Log[(b*(c
+ d*x))/(b*c - a*d)])/(b*g) + (B^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*
c - a*d)])/(b*g) - (2*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/
(b*g) + (2*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*(Log[(a + b*x)^(-1)] + Log[c
+ d*x] - Log[(e*(c + d*x))/(a + b*x)])*Log[a*g + b*g*x])/(b*g) + ((A + B*Lo
g[(e*(c + d*x))/(a + b*x)])^2*Log[a*g + b*g*x])/(b*g) - (B^2*Log[(b*(c + d*
x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g) + (B^2*Log[(e*(c + d*x))/(a + b*
x)]*Log[a*g + b*g*x]^2)/(b*g) - (2*A*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/(b*g) - (2*B^2*Log[(a + b*x)^(-1)]*PolyLog[2, -((d*(a + b*x))/(b*c -
a*d))])/(b*g) + (2*B^2*(Log[(a + b*x)^(-1)] + Log[c + d*x] - Log[(e*(c + d*
x))/(a + b*x)])*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (2*B^2*Lo
g[c + d*x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) - (2*B^2*PolyLog[3,
 -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*PolyLog[3, (b*(c + d*x))/(b*
c - a*d)])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
```

```
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6691

```
Int[(u_)^(m_.)*((a_.)*(u_)^(n_) + (v_))^(p_.)*(w_), x_Symbol] :> Int[u^(m +
 n*p)*(a + v/u^n)^p*w, x] /; FreeQ[{a, m, n}, x] && IntegerQ[p] &&  !GtQ[n,
 0] &&  !FreeQ[v, x]
```

Rule 6741

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{e(c+dx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{\left(de-\frac{be(c+dx)}{a+bx}\right)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+}{c+dx}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(bc-ad)e\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx}{(a+bx)(c+dx)}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int \frac{\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+b}{(a+bx)(c+dx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag}{(bc-ad)(a+bx)}\right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} -$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int\left(\frac{A\log(ag+bgx)}{-a-bx}+\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)\log(ag}{-a-bx}\right.}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2AB)\int \frac{\log(ag+bgx)}{-a-bx}\,dx}{g} - \frac{\left(2B^2\right)\int \frac{\log\left(\frac{e(c}{a}\right.}{}}{}$$

$$= -\frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} + \frac{B^2}{}$$

$$= -\frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{2B^2\log\left(\frac{b(c+dx)}{bc-ad}\right)\left(\log\left(\frac{1}{a+bx}\right)+\log(c+dx\right.}{bg}$$

$$= \frac{AB\log^2(g(a+bx))}{bg} - \frac{2B^2\log\left(\frac{1}{a+bx}\right)\log(g(a+bx))\log(c+dx)}{bg} - \frac{B^2\log(g(a}{}$$

$$= \frac{AB\log^2(g(a+bx))}{bg} - \frac{2B^2\log\left(\frac{1}{a+bx}\right)\log(g(a+bx))\log(c+dx)}{bg} + \frac{B^2\log\left(-\frac{d(}{b}\right.}{}$$

$$= \frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2\left(\frac{1}{a+bx}\right)\log(c+dx)}{bg} - \frac{2B^2\,\mathrm{l}}{}$$

$$= \frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2\left(\frac{1}{a+bx}\right)\log(c+dx)}{bg} - \frac{2B^2\,\mathrm{l}}{}$$

$$= AB\log^2(g(a+bx)) + B^2\log^3(g(a+bx)) - B^2\log^2\left(\frac{1}{a+bx}\right)\log(c+dx) - 2B^2\,\mathrm{l}$$

Mathematica [**A**] time = 0.29, size = 251, normalized size = 1.96

$$\frac{A^2\log(a+bx)+2AB\log(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)+2AB\operatorname{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)-2AB\log(a+bx)\log\left(\frac{c}{d}+x\right)+2AB\log\left(\frac{c}{d}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x),x]
```

```
[Out] (-(A*B*Log[a/b + x]^2) + A^2*Log[a + b*x] + 2*A*B*Log[a/b + x]*Log[a + b*x]
 - 2*A*B*Log[c/d + x]*Log[a + b*x] + 2*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(
-(b*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(c + d*x))/(a + b*x)] - B^2*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(c + d*x))/(a + b*x)]^2 + 2*A*B*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)] - 2*B^2*Log[(e*(c + d*x))/(a + b*x)]*PolyLo
g[2, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*PolyLog[3, (b*(c + d*x))/(d*(a +
b*x))])/(b*g)
```

fricas [**F**] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{dex+ce}{bx+a}\right)^2+2\,AB\log\left(\frac{dex+ce}{bx+a}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((d*e*x + c*e)/(b*x + a))^2 + 2*A*B*log((d*e*x + c*e)/(b*x
 + a)) + A^2)/(b*g*x + a*g), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 0.06, size = 906, normalized size = 7.08

$$-\frac{B^2ad\ln\left(-\frac{\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)b}{de}+1\right)\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)^2}{(ad-bc)\,bg}+\frac{B^2c\ln\left(-\frac{\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)b}{de}+1\right)\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)^2}{(ad-bc)\,g}-\frac{2ABad\ln\left(-\frac{-de+\left(\right.}{}\right.}{(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)/(b*x+a)*e)+A)^2/(b*g*x+a*g),x)
```

```
[Out] -1/b/g/(a*d-b*c)*A^2*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*a*d+1/g/(a*
d-b*c)*A^2*ln(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)*c-1/b/g/(a*d-b*c)*B^2
*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*ln(1-b/d/e*(1/b*d*e-(a*d-b*c)/(b*x+a)/
b*e))*a*d+1/g/(a*d-b*c)*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*ln(1-b/d/e*
(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e))*c-2/b/g/(a*d-b*c)*B^2*ln(1/b*d*e-(a*d-b*c)
/(b*x+a)/b*e)*polylog(2,b/d/e*(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e))*a*d+2/g/(a*d
-b*c)*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*polylog(2,b/d/e*(1/b*d*e-(a*d-b
*c)/(b*x+a)/b*e))*c+2/b/g/(a*d-b*c)*B^2*polylog(3,b/d/e*(1/b*d*e-(a*d-b*c)/
(b*x+a)/b*e))*a*d-2/g/(a*d-b*c)*B^2*polylog(3,b/d/e*(1/b*d*e-(a*d-b*c)/(b*x
+a)/b*e))*c-2/b/g/(a*d-b*c)*A*B*dilog(-(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e
```

```
)*b)/d/e)*a*d+2/g/(a*d-b*c)*A*B*dilog(-(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e
)*b)/d/e)*c-2/b/g/(a*d-b*c)*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*ln(-(-d*e
+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)/d/e)*a*d+2/g/(a*d-b*c)*A*B*ln(1/b*d*e-(
a*d-b*c)/(b*x+a)/b*e)*ln(-(-d*e+(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*b)/d/e)*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{B^2\log\left(bx+a\right)\log\left(dx+c\right)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2\,ABbc\log(e)+\left(B^2bdx+B^2bc\right)\log\left(bx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - integr
ate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log(b*x +
 a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x - 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) + 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x - (2*B^2*b*d*x + (b*c + a*d)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)^2}{a\,g+b\,g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))^2/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(c + d*x))/(a + b*x)))^2/(a*g + b*g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{A^2}{a+bx}\,dx+\int\frac{B^2\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)^2}{a+bx}\,dx+\int\frac{2AB\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}{a+bx}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g),x)
```

```
[Out] (Integral(A**2/(a + b*x), x) + Integral(B**2*log(c*e/(a + b*x) + d*e*x/(a +
 b*x))**2/(a + b*x), x) + Integral(2*A*B*log(c*e/(a + b*x) + d*e*x/(a + b*x
))/(a + b*x), x))/g
```

3.187 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=153

$$-\frac{(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}+\frac{2AB(c+dx)}{g^2(a+bx)(bc-ad)}+\frac{2B^2(c+dx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{g^2(a+bx)(bc-ad)}-\frac{2B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] 2*A*B*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)-2*B^2*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)+2
*B^2*(d*x+c)*ln(e*(d*x+c)/(b*x+a))/(-a*d+b*c)/g^2/(b*x+a)-(d*x+c)*(A+B*ln(e
*(d*x+c)/(b*x+a)))^2/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [C] time = 0.76, antiderivative size = 470, normalized size of antiderivative = 3.07, number of steps used = 26, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.344$, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d\,\mathrm{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{2B^2d\,\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}+\frac{2Bd\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg^2(bc-ad)}-\frac{2Bd\log(c+dx}{bg^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-2*B^2)/(b*g^2*(a + b*x)) - (2*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) + (2*B^2*d*Log[c + d*x])/(b*(b*c
 - a*d)*g^2) - (2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(
b*c - a*d)*g^2) + (B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (2*B^2*d*Log
[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) + (2*B*(A + B
*Log[(e*(c + d*x))/(a + b*x)]))/(b*g^2*(a + b*x)) + (2*B*d*Log[a + b*x]*(A
+ B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^2) - (2*B*d*Log[c + d*x
]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^2) - (A + B*Log[(e
*(c + d*x))/(a + b*x)])^2/(b*g^2*(a + b*x)) - (2*B^2*d*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (2*B^2*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int\frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int\Bigg(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)^2(a+bx)}}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(2Bd)\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{(bc-ad)g^2}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^2} - \frac{2Bd\log(c+d}{b}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^2} - \frac{2Bd\log(c+d}{b}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^2} - \frac{2Bd\log(c+d}{b}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} + \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{2B^2d\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c}{b(bc-ad)g^2}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{2B^2d}{}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{2B^2d}{}$$

Mathematica [C] time = 0.48, size = 314, normalized size = 2.05

$$-\frac{\frac{B\Big(-2(bc-ad)\Big(B\log\Big(\frac{e(c+dx)}{a+bx}\Big)+A\Big)-2d(a+bx)\log(a+bx)\Big(B\log\Big(\frac{e(c+dx)}{a+bx}\Big)+A\Big)+2d(a+bx)\log(c+dx)\Big(B\log\Big(\frac{e(c+dx)}{a+bx}\Big)+A\Big)-Bd(a+bx)\Big(\log(a+bx)\Big(\log(a+bx)}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(2*B*(b*c - a*d + d*(a + b*x
)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 2*(b*c - a*d)*(A + B*Log[(e*(c
 + d*x))/(a + b*x)]) - 2*d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(c + d*x))/
(a + b*x)]) + 2*d*(a + b*x)*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)
]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a + b*x)*((2*L
```

```
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

fricas [A] time = 0.67, size = 154, normalized size = 1.01

$$-\frac{\left(A^2-2\,AB+2\,B^2\right)bc-\left(A^2-2\,AB+2\,B^2\right)ad+\left(B^2bdx+B^2bc\right)\log\left(\frac{dex+ce}{bx+a}\right)^2+2\left(\left(AB-B^2\right)bdx+\left(AB-\right.\right.}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x, algorithm="fricas
")
```

```
[Out] -((A^2 - 2*A*B + 2*B^2)*b*c - (A^2 - 2*A*B + 2*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((d*e*x + c*e)/(b*x + a))^2 + 2*((A*B - B^2)*b*d*x + (A*B - B^2)*b*
c)*log((d*e*x + c*e)/(b*x + a)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*
b*d)*g^2)
```

giac [A] time = 1.55, size = 188, normalized size = 1.23

$$-\left(\frac{(dxe+ce)B^2\log\left(\frac{dxe+ce}{bx+a}\right)^2}{(bx+a)g^2}+\frac{2\,(dxe+ce)\left(AB-B^2\right)\log\left(\frac{dxe+ce}{bx+a}\right)}{(bx+a)g^2}+\frac{(dxe+ce)\left(A^2-2\,AB+2\,B^2\right)}{(bx+a)g^2}\right)\left(\frac{\,}{(bce-a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] -((d*x*e + c*e)*B^2*log((d*x*e + c*e)/(b*x + a))^2/((b*x + a)*g^2) + 2*(d*x
*e + c*e)*(A*B - B^2)*log((d*x*e + c*e)/(b*x + a))/((b*x + a)*g^2) + (d*x*e
 + c*e)*(A^2 - 2*A*B + 2*B^2)/((b*x + a)*g^2))*(b*c/((b*c*e - a*d*e)*(b*c -
 a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))
```

maple [B] time = 0.05, size = 1251, normalized size = 8.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)/(b*x+a)*e)+A)^2/(b*g*x+a*g)^2,x)
```

```
[Out] -2*b/(a*d-b*c)^2/g^2*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)*c^2-1/b/
(a*d-b*c)^2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)*a^2*d^2-2/b
/(a*d-b*c)^2/g^2*A*B*d^2*a+2/(a*d-b*c)^2/g^2*A*B*d*c-1/b/(a*d-b*c)^2/g^2*A^
2/(b*x+a)*a^2*d^2+2*b/(a*d-b*c)^2/g^2*A*B/(b*x+a)*c^2+2/b/(a*d-b*c)^2/g^2*B
^2*d^2*a-2/(a*d-b*c)^2/g^2*B^2*d*c+1/b/(a*d-b*c)^2/g^2*A^2*d^2*a-1/(a*d-b*c
)^2/g^2*A^2*d*c-2*b/(a*d-b*c)^2/g^2*B^2/(b*x+a)*c^2-b/(a*d-b*c)^2/g^2*A^2/(
b*x+a)*c^2+2/(a*d-b*c)^2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d*c-1/(a
*d-b*c)^2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*d*c-2/b/(a*d-b*c)^2/g
^2*B^2/(b*x+a)*a^2*d^2+4/(a*d-b*c)^2/g^2*B^2/(b*x+a)*a*d*c+2/(a*d-b*c)^2/g^
2*A^2/(b*x+a)*a*d*c+2*b/(a*d-b*c)^2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*
e)/(b*x+a)*c^2-2/(a*d-b*c)^2/g^2*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d*c+
1/b/(a*d-b*c)^2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*d^2*a-b/(a*d-b*
c)^2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)*c^2-2/b/(a*d-b*c)^
2/g^2*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2*a-4/(a*d-b*c)^2/g^2*A*B/(b*
x+a)*a*d*c+2/b/(a*d-b*c)^2/g^2*A*B/(b*x+a)*a^2*d^2-4/(a*d-b*c)^2/g^2*B^2*ln
(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)*a*d*c+2/(a*d-b*c)^2/g^2*B^2*ln(1/b*
d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)*a*d*c+2/b/(a*d-b*c)^2/g^2*B^2*ln(1/b*d
*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)*a^2*d^2+2/b/(a*d-b*c)^2/g^2*A*B*ln(1/b*d*
e-(a*d-b*c)/(b*x+a)/b*e)*d^2*a+4/(a*d-b*c)^2/g^2*A*B*ln(1/b*d*e-(a*d-b*c)/(
```

```
b*x+a)/b*e)/(b*x+a)*a*d*c-2/b/(a*d-b*c)^2/g^2*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x
+a)/b*e)/(b*x+a)*a^2*d^2
```

maxima [**B**] time = 1.25, size = 416, normalized size = 2.72

$$\left(2\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{\left(b^2c-abd\right)g^2}-\frac{d\log(dx+c)}{\left(b^2c-abd\right)g^2}\right)\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)+\frac{(bdx+ad)\log(bx+a)^2+(bdx+a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x, algorithm="maxima
")
```

```
[Out] (2*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(
d*x + c)/((b^2*c - a*b*d)*g^2))*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + ((b*
d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d -
2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))
*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))*B
^2 - 2*A*B*(log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^2*g^2*x + a*b*g^2) - 1/
(b^2*g^2*x + a*b*g^2) - d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + d*log(d*x +
c)/((b^2*c - a*b*d)*g^2)) - B^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^2
*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

mupad [**B**] time = 6.38, size = 223, normalized size = 1.46

$$\frac{\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)\left(\frac{2\,B^2}{b^2\,d\,g^2}-\frac{2\,A\,B}{b^2\,d\,g^2}\right)}{\frac{x}{d}+\frac{a}{b\,d}}-\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)^2\left(\frac{B^2}{b^2\,g^2\,\left(x+\frac{a}{b}\right)}-\frac{B^2\,d}{b\,g^2\,\left(a\,d-b\,c\right)}\right)-\frac{A^2-2\,A\,B+2\,B^2}{x\,b^2\,g^2+a\,b\,g^2}+\frac{B\,d\,\mathrm{atan}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))^2/(a*g + b*g*x)^2,x)
```

```
[Out] (log((e*(c + d*x))/(a + b*x))*((2*B^2)/(b^2*d*g^2) - (2*A*B)/(b^2*d*g^2)))/
(x/d + a/(b*d)) - log((e*(c + d*x))/(a + b*x))^2*(B^2/(b^2*g^2*(x + a/b)) -
 (B^2*d)/(b*g^2*(a*d - b*c))) - (A^2 + 2*B^2 - 2*A*B)/(b^2*g^2*x + a*b*g^2)
 + (B*d*atan(((2*b*d*x + (b^2*c*g^2 + a*b*d*g^2)/(b*g^2))*1i)/(a*d - b*c))*
(A - B)*4i)/(b*g^2*(a*d - b*c))
```

sympy [**B**] time = 3.75, size = 430, normalized size = 2.81

$$\frac{2Bd\,(A-B)\log\left(x+\frac{2ABad^2+2ABbcd-2B^2ad^2-2B^2bcd-\frac{2Ba^2d^3(A-B)}{ad-bc}+\frac{4Babcd^2(A-B)}{ad-bc}-\frac{2Bb^2c^2d(A-B)}{ad-bc}}{4ABbd^2-4B^2bd^2}\right)}{bg^2\,(ad-bc)}-\frac{2Bd\,(A-B)\log\left(x+\frac{2ABad^2+2}{}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] 2*B*d*(A - B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d - 2*B**2*a*d**2 - 2*B**2*
b*c*d - 2*B*a**2*d**3*(A - B)/(a*d - b*c) + 4*B*a*b*c*d**2*(A - B)/(a*d - b
*c) - 2*B*b**2*c**2*d*(A - B)/(a*d - b*c))/(4*A*B*b*d**2 - 4*B**2*b*d**2))/
(b*g**2*(a*d - b*c)) - 2*B*d*(A - B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d -
2*B**2*a*d**2 - 2*B**2*b*c*d + 2*B*a**2*d**3*(A - B)/(a*d - b*c) - 4*B*a*b*
c*d**2*(A - B)/(a*d - b*c) + 2*B*b**2*c**2*d*(A - B)/(a*d - b*c))/(4*A*B*b*
d**2 - 4*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B + 2*B**2)*log(e*(c +
d*x)/(a + b*x))/(a*b*g**2 + b**2*g**2*x) + (B**2*c + B**2*d*x)*log(e*(c + d
*x)/(a + b*x))**2/(a**2*d*g**2 - a*b*c*g**2 + a*b*d*g**2*x - b**2*c*g**2*x)
 + (-A**2 + 2*A*B - 2*B**2)/(a*b*g**2 + b**2*g**2*x)
```

3.188 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=296

$$\frac{bB(c+dx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{g^3(a+bx)(bc-ad)^2}-\frac{2A}{g^3(a+}$$

```
[Out] -2*A*B*d*(d*x+c)/(-a*d+b*c)^2/g^3/(b*x+a)+2*B^2*d*(d*x+c)/(-a*d+b*c)^2/g^3/
(b*x+a)-1/4*b*B^2*(d*x+c)^2/(-a*d+b*c)^2/g^3/(b*x+a)^2-2*B^2*d*(d*x+c)*ln(e
*(d*x+c)/(b*x+a))/(-a*d+b*c)^2/g^3/(b*x+a)+1/2*b*B*(d*x+c)^2*(A+B*ln(e*(d*x
+c)/(b*x+a)))/(-a*d+b*c)^2/g^3/(b*x+a)^2+d*(d*x+c)*(A+B*ln(e*(d*x+c)/(b*x+a
)))^2/(-a*d+b*c)^2/g^3/(b*x+a)-1/2*b*(d*x+c)^2*(A+B*ln(e*(d*x+c)/(b*x+a)))^
2/(-a*d+b*c)^2/g^3/(b*x+a)^2
```

Rubi [C] time = 0.91, antiderivative size = 578, normalized size of antiderivative = 1.95, number of steps used = 30, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -B^2/(4*b*g^3*(a + b*x)^2) + (3*B^2*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (3
*B^2*d^2*Log[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (B^2*d^2*Log[a + b*x]^2)/(
2*b*(b*c - a*d)^2*g^3) - (3*B^2*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3) +
 (B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*
g^3) - (B^2*d^2*Log[c + d*x]^2)/(2*b*(b*c - a*d)^2*g^3) + (B^2*d^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) + (B*(A + B*Log[
(e*(c + d*x))/(a + b*x)]))/(2*b*g^3*(a + b*x)^2) - (B*d*(A + B*Log[(e*(c +
d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Log[a + b*x]*(A +
 B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*
x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)^2*g^3) - (A + B*Log
[(e*(c + d*x))/(a + b*x)])^2/(2*b*g^3*(a + b*x)^2) + (B^2*d^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*PolyLog[2, (b
*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right.\right.}{(bc-ad)^2(a+bx)^2}\right.}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(Bd^2\right)\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2bg^3(a+bx)^2} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{Bd^2\log(a+bx)\left(A+B\,\mathrm{l}\right.}{b(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2bg^3(a+bx)^2} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{Bd^2\log(a+bx)\left(A+B\,\mathrm{l}\right.}{b(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2bg^3(a+bx)^2} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{Bd^2\log(a+bx)\left(A+B\,\mathrm{l}\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{3B^2d^2\log(c+}{2b(bc-ad)^2}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{3B^2d^2\log(c+}{2b(bc-ad)^2}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+}{2b(bc-ad)^2}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+}{2b(bc-ad)^2}$$

Mathematica [C] time = 0.44, size = 444, normalized size = 1.50

$$\frac{B\left(-4d^2(a+bx)^2\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+4d^2(a+bx)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+2(bc-ad)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+4d(a+bx)(ad-bc)\left(B\log\left(\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(4*B*d*(a + b*x)*(b*c - a*d
 + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*((b*c - a*d)^2
+ 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a
+ b*x)^2*Log[c + d*x]) + 2*(b*c - a*d)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)
]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 4*
d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) + 4*d^2*(
a + b*x)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 2*B*d^2*(a +
```

```
 b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d^2*(a + b*x)^2*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*b*g^3*(a + b*x)^2)
```

fricas [A] time = 0.82, size = 373, normalized size = 1.26

$$-\frac{\left(2\,A^{2}-2\,AB+B^{2}\right)b^{2}c^{2}-4\left(A^{2}-2\,AB+2\,B^{2}\right)abcd+\left(2\,A^{2}-6\,AB+7\,B^{2}\right)a^{2}d^{2}-2\left(B^{2}b^{2}d^{2}x^{2}+2\,B^{2}abd^{2}x-\right.}{4\left(\left(b^{5}c^{2}-\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*((2*A^2 - 2*A*B + B^2)*b^2*c^2 - 4*(A^2 - 2*A*B + 2*B^2)*a*b*c*d + (2*
A^2 - 6*A*B + 7*B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b
^2*c^2 + 2*B^2*a*b*c*d)*log((d*e*x + c*e)/(b*x + a))^2 + 2*((2*A*B - 3*B^2)
*b^2*c*d - (2*A*B - 3*B^2)*a*b*d^2)*x - 2*((2*A*B - 3*B^2)*b^2*d^2*x^2 - (2
*A*B - B^2)*b^2*c^2 + 4*(A*B - B^2)*a*b*c*d - 2*(B^2*b^2*c*d - 2*(A*B - B^2
)*a*b*d^2)*x)*log((d*e*x + c*e)/(b*x + a)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b
^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*
b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [A] time = 2.19, size = 493, normalized size = 1.67

$$\frac{\left(\frac{4\,(dxe+ce)B^{2}de\log\left(\frac{dxe+ce}{bx+a}\right)^{2}}{bx+a}+\frac{8\,(dxe+ce)ABde\log\left(\frac{dxe+ce}{bx+a}\right)}{bx+a}-\frac{8\,(dxe+ce)B^{2}de\log\left(\frac{dxe+ce}{bx+a}\right)}{bx+a}-\frac{2\,(dxe+ce)^{2}B^{2}b\log\left(\frac{dxe+ce}{bx+a}\right)^{2}}{(bx+a)^{2}}+\frac{4\,(dxe+ce)A^{2}de}{bx+a}-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] 1/4*(4*(d*x*e + c*e)*B^2*d*e*log((d*x*e + c*e)/(b*x + a))^2/(b*x + a) + 8*(
d*x*e + c*e)*A*B*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 8*(d*x*e + c*
e)*B^2*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 2*(d*x*e + c*e)^2*B^2*b
*log((d*x*e + c*e)/(b*x + a))^2/(b*x + a)^2 + 4*(d*x*e + c*e)*A^2*d*e/(b*x
+ a) - 8*(d*x*e + c*e)*A*B*d*e/(b*x + a) + 8*(d*x*e + c*e)*B^2*d*e/(b*x + a
) - 4*(d*x*e + c*e)^2*A*B*b*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 2*(d
*x*e + c*e)^2*B^2*b*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 - 2*(d*x*e + c
*e)^2*A^2*b/(b*x + a)^2 + 2*(d*x*e + c*e)^2*A*B*b/(b*x + a)^2 - (d*x*e + c*
e)^2*B^2*b/(b*x + a)^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e -
a*d*e)*(b*c - a*d)))/(b*c*g^3*e - a*d*g^3*e)
```

maple [B] time = 0.05, size = 1934, normalized size = 6.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)/(b*x+a)*e)+A)^2/(b*g*x+a*g)^3,x)
```

```
[Out] b/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d/(b*x+a)*c^2-1/2/b
/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^2*a^3*d^3+
3/2/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^2*a^2*d
^2*c-2/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2/(b*x+a)*a*
c-3/2/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^2*a^2*d
^2*c-3/4*b/(a*d-b*c)^3/g^3*B^2/(b*x+a)^2*a*d*c^2+b/(a*d-b*c)^3/g^3*A*B*d/(b
```

```
*x+a)*c^2+1/2/b/(a*d-b*c)^3/g^3*A*B/(b*x+a)^2*a^3*d^3+1/b/(a*d-b*c)^3/g^3*A
*B*d^3/(b*x+a)*a^2-3/2*b/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*a*d*c^2-2/(a*d-b*c)^
3/g^3*A*B*d^2/(b*x+a)*c*a+1/2/b/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b
*x+a)/b*e)/(b*x+a)^2*a^3*d^3+b^2/(a*d-b*c)^3/g^3*A*B*ln(1/b*d*e-(a*d-b*c)/(
b*x+a)/b*e)/(b*x+a)^2*c^3-1/2/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x
+a)/b*e)^2*d^2*c+3/2/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*
d^2*c+1/2*b^2/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*c^3+1/4*b^2/(a*d-b*c)^3/g^3*B^2
/(b*x+a)^2*c^3-3/2/(a*d-b*c)^3/g^3*A*B/(b*x+a)^2*a^2*d^2*c-1/4/b/(a*d-b*c)^
3/g^3*B^2/(b*x+a)^2*a^3*d^3-3/2/b/(a*d-b*c)^3/g^3*B^2*d^3/(b*x+a)*a^2+3/2/(
a*d-b*c)^3/g^3*A^2/(b*x+a)^2*a^2*d^2*c+3/4/(a*d-b*c)^3/g^3*B^2/(b*x+a)^2*a^
2*d^2*c-1/2/b/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*a^3*d^3-3/2*b/(a*d-b*c)^3/g^3*B
^2*d/(b*x+a)*c^2-1/2*b^2/(a*d-b*c)^3/g^3*A*B/(b*x+a)^2*c^3+1/2*b^2/(a*d-b*c
)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^2*c^3-3/2/b/(a*d-b*
c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3*a+1/2/b/(a*d-b*c)^3/g^3*
B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*d^3*a-1/2*b^2/(a*d-b*c)^3/g^3*B^2*l
n(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^2*c^3-1/(a*d-b*c)^3/g^3*A*B*ln(1/b
*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2*c+1/2/b/(a*d-b*c)^3/g^3*A^2*d^3*a+1/b/(a*d-
b*c)^3/g^3*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3*a+1/b/(a*d-b*c)^3/g^3*
B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(b*x+a)*a^2+7/4/b/(a*d-b*c)^3/g^3
*B^2*d^3*a-7/4/(a*d-b*c)^3/g^3*B^2*d^2*c+3/(a*d-b*c)^3/g^3*B^2*d^2/(b*x+a)*
a*c-1/2/(a*d-b*c)^3/g^3*A^2*d^2*c-3/2/b/(a*d-b*c)^3/g^3*A*B*d^3*a+3/2/(a*d-
b*c)^3/g^3*A*B*d^2*c+3/(a*d-b*c)^3/g^3*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e
)/(b*x+a)^2*a^2*d^2*c-3/2*b/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a
)/b*e)^2/(b*x+a)^2*a*d*c^2-1/b/(a*d-b*c)^3/g^3*A*B*ln(1/b*d*e-(a*d-b*c)/(b*
x+a)/b*e)/(b*x+a)^2*a^3*d^3+3/2*b/(a*d-b*c)^3/g^3*A*B/(b*x+a)^2*c^2*a*d+3/2
*b/(a*d-b*c)^3/g^3*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^2*a*d*c^2-
3*b/(a*d-b*c)^3/g^3*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^2*c^2*a*d
```

maxima **[B]** time = 1.52, size = 847, normalized size = 2.86

$$-\frac{1}{4}\left(2\left(\frac{2\,bdx - bc + 3\,ad}{\left(b^{4}c - ab^{3}d\right)g^{3}x^{2} + 2\left(ab^{3}c - a^{2}b^{2}d\right)g^{3}x + \left(a^{2}b^{2}c - a^{3}bd\right)g^{3}} + \frac{2\,d^{2}\log\left(bx + a\right)}{\left(b^{3}c^{2} - 2\,ab^{2}cd + a^{2}bd^{2}\right)g^{3}} - \frac{2\,d^{2}}{\left(b^{3}c^{2} - 2\right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x, algorithm="maxima
")
```

```
[Out] -1/4*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c -
a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^
2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*
c*d + a^2*b*d^2)*g^3))*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + (b^2*c^2 - 8*
a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^
2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a
*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2
*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2
)*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*
d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*
c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 - 1/2*A*B*((2*b*d*x
- b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x +
 (a^2*b^2*c - a^3*b*d)*g^3) + 2*log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^3*g
^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^
2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*
b*d^2)*g^3)) - 1/2*B^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^3*g^3*x^2
+ 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b
*g^3)
```

mupad [**B**] time = 6.00, size = 507, normalized size = 1.71

$$\frac{\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)\left(\frac{B^2\,x\,(a\,d-b\,c)}{b\,g^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{A\,B}{b^2\,d\,g^3}+\frac{B^2\,d^2\,\left(\frac{2\,a^2\,d^2-3\,a\,b\,c\,d+b^2\,c^2}{2\,b\,d^3}+\frac{a\,(a\,d-b\,c)}{2\,b\,d^2}\right)}{b\,g^3\,\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)}{\frac{b\,x^2}{d}+\frac{a^2}{b\,d}+\frac{2\,a\,x}{d}}-\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)^2\left(\frac{B^2}{2\,b^2\,g^3\,\left(2\,a\,x+b\,x\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))^2/(a*g + b*g*x)^3,x)
```

```
[Out] (log((e*(c + d*x))/(a + b*x))*((B^2*x*(a*d - b*c))/(b*g^3*(a^2*d^2 + b^2*c^
2 - 2*a*b*c*d)) - (A*B)/(b^2*d*g^3) + (B^2*d^2*((2*a^2*d^2 + b^2*c^2 - 3*a*
b*c*d)/(2*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)))/(b*g^3*(a^2*d^2 + b^2*c^2 -
2*a*b*c*d))))/((b*x^2)/d + a^2/(b*d) + (2*a*x)/d) - log((e*(c + d*x))/(a +
b*x))^2*(B^2/(2*b^2*g^3*(2*a*x + b*x^2 + a^2/b)) - (B^2*d^2)/(2*b*g^3*(a^2*
d^2 + b^2*c^2 - 2*a*b*c*d))) - ((2*A^2*a*d - 2*A^2*b*c + 7*B^2*a*d - B^2*b*
c - 6*A*B*a*d + 2*A*B*b*c)/(2*(a*d - b*c)) + (x*(3*B^2*b*d - 2*A*B*b*d))/(a
*d - b*c))/(2*a^2*b*g^3 + 2*b^3*g^3*x^2 + 4*a*b^2*g^3*x) - (B*d^2*atan((B*d
^2*(2*b*d*x - (b^3*c^2*g^3 - a^2*b*d^2*g^3)/(b*g^3*(a*d - b*c)))*(2*A - 3*B
)*1i)/((a*d - b*c)*(3*B^2*d^2 - 2*A*B*d^2)))*(2*A - 3*B)*1i)/(b*g^3*(a*d -
b*c)^2)
```

sympy [**B**] time = 6.55, size = 892, normalized size = 3.01

$$\frac{Bd^2\left(2A-3B\right)\log\left(x+\frac{2ABad^3+2ABbcd^2-3B^2ad^3-3B^2bcd^2-\frac{Ba^3d^5(2A-3B)}{(ad-bc)^2}+\frac{3Ba^2bcd^4(2A-3B)}{(ad-bc)^2}-\frac{3Bab^2c^2d^3(2A-3B)}{(ad-bc)^2}+\frac{Bb^3c^3d^2(2A-3B)}{(ad-bc)^2}}{4ABbd^3-6B^2bd^3}\right)}{2bg^3\left(ad-bc\right)^2}-\frac{Bd^2\left(2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] B*d**2*(2*A - 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 - 3*B**2*a*d**3 -
 3*B**2*b*c*d**2 - B*a**3*d**5*(2*A - 3*B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d*
*4*(2*A - 3*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3*(2*A - 3*B)/(a*d - b*c
)**2 + B*b**3*c**3*d**2*(2*A - 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 - 6*B**2*
b*d**3))/(2*b*g**3*(a*d - b*c)**2) - B*d**2*(2*A - 3*B)*log(x + (2*A*B*a*d*
*3 + 2*A*B*b*c*d**2 - 3*B**2*a*d**3 - 3*B**2*b*c*d**2 + B*a**3*d**5*(2*A -
3*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4*(2*A - 3*B)/(a*d - b*c)**2 + 3*B*a*
b**2*c**2*d**3*(2*A - 3*B)/(a*d - b*c)**2 - B*b**3*c**3*d**2*(2*A - 3*B)/(a
*d - b*c)**2)/(4*A*B*b*d**3 - 6*B**2*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + (
2*B**2*a*c*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(c +
 d*x)/(a + b*x))**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*g
**3*x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*g
**3*x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**3
*x**2) + (-2*A*B*a*d + 2*A*B*b*c + 3*B**2*a*d - B**2*b*c + 2*B**2*b*d*x)*lo
g(e*(c + d*x)/(a + b*x))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + 4*a**2*b**
2*d*g**3*x - 4*a*b**3*c*g**3*x + 2*a*b**3*d*g**3*x**2 - 2*b**4*c*g**3*x**2)
 + (-2*A**2*a*d + 2*A**2*b*c + 6*A*B*a*d - 2*A*B*b*c - 7*B**2*a*d + B**2*b*
c + x*(4*A*B*b*d - 6*B**2*b*d))/(4*a**3*b*d*g**3 - 4*a**2*b**2*c*g**3 + x**
2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 - 8*a*b**3*c*g*
*3))
```

3.189 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=399

$$\frac{2b^2B(c+dx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{2Bd^3\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{2Bd^2(c+dx)\Big(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{g^4(a+bx)(bc-ad)^3}$$

```
[Out] -2*B^2*d^2*(d*x+c)/(-a*d+b*c)^3/g^4/(b*x+a)+1/2*b*B^2*d*(d*x+c)^2/(-a*d+b*c
)^3/g^4/(b*x+a)^2-2/27*b^2*B^2*(d*x+c)^3/(-a*d+b*c)^3/g^4/(b*x+a)^3+1/3*B^2
*d^3*ln((d*x+c)/(b*x+a))^2/b/(-a*d+b*c)^3/g^4+2*B*d^2*(d*x+c)*(A+B*ln(e*(d*
x+c)/(b*x+a)))/(-a*d+b*c)^3/g^4/(b*x+a)-b*B*d*(d*x+c)^2*(A+B*ln(e*(d*x+c)/(
b*x+a)))/(-a*d+b*c)^3/g^4/(b*x+a)^2+2/9*b^2*B*(d*x+c)^3*(A+B*ln(e*(d*x+c)/(
b*x+a)))/(-a*d+b*c)^3/g^4/(b*x+a)^3-2/3*B*d^3*ln((d*x+c)/(b*x+a))*(A+B*ln(e
*(d*x+c)/(b*x+a)))/b/(-a*d+b*c)^3/g^4-1/3*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b/g
^4/(b*x+a)^3
```

Rubi [C] time = 1.07, antiderivative size = 680, normalized size of antiderivative = 1.70, number of steps used = 34, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B^2)/(27*b*g^4*(a + b*x)^3) + (5*B^2*d)/(18*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (11*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (11*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)^3
*g^4) + (11*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*Log[
-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (B^2*
d^3*Log[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*Log[a + b*x]*Log[(
b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) + (2*B*(A + B*Log[(e*(c
+ d*x))/(a + b*x)]))/(9*b*g^4*(a + b*x)^3) - (B*d*(A + B*Log[(e*(c + d*x))/
(a + b*x)]))/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (2*B*d^2*(A + B*Log[(e*(c
+ d*x))/(a + b*x)]))/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (2*B*d^3*Log[a + b
*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*(b*c - a*d)^3*g^4) - (2*B*d^
3*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*(b*c - a*d)^3*g^4
) - (A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(3*b*g^4*(a + b*x)^3) - (2*B^2*d
^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b*(b*c - a*d)^3*g^4) - (2*B
^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^4}\,dx &= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B)\int\frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}\\
&= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}\\
&= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^4}-\frac{bd\left(-A-B\log\left(\frac{e(c+d}{a+b}\right.\right.}{(bc-ad)^2(a+bx)^3}\right.}{}\\
&= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3}+\frac{(2B)\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^4}\,dx}{3g^4}-\frac{\left(2Bd^3\right)\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}}{3(bc-ad)^3g^4}\\
&= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{9bg^4(a+bx)^3}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2}+\frac{2Bd^2\left(A+B\log\left(\frac{e(c+dx}{a+bx}\right.\right.}{3b(bc-ad)^2g^4(a+bx}\\
&= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{9bg^4(a+bx)^3}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2}+\frac{2Bd^2\left(A+B\log\left(\frac{e(c+dx}{a+bx}\right.\right.}{3b(bc-ad)^2g^4(a+bx}\\
&= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{9bg^4(a+bx)^3}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2}+\frac{2Bd^2\left(A+B\log\left(\frac{e(c+dx}{a+bx}\right.\right.}{3b(bc-ad)^2g^4(a+bx}\\
&= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b(}\\
&= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b(}\\
&= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b(}\\
&= -\frac{2B^2}{27bg^4(a+bx)^3}+\frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2}-\frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)}-\frac{11B^2d}{9b(}
\end{aligned}
$$

Mathematica [C] time = 0.68, size = 585, normalized size = 1.47

$$
-\frac{B\left(-36d^3(a+bx)^3\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+36d^3(a+bx)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+36d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)-12(bc-ad\right.}{}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -1/54*(18*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(36*B*d^2*(a + b*x)^2
*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*
(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2
```

```
*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*
d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)
^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 12*(b*c - a*d)^3*(A + B
*Log[(e*(c + d*x))/(a + b*x)]) + 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e
*(c + d*x))/(a + b*x)]) + 36*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(
c + d*x))/(a + b*x)]) - 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(c +
d*x))/(a + b*x)]) + 36*d^3*(a + b*x)^3*Log[c + d*x]*(A + B*Log[(e*(c + d*x)
)/(a + b*x)]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b
*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 1
8*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*L
og[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^3)/(b*
g^4*(a + b*x)^3)
```

fricas [A] time = 2.03, size = 680, normalized size = 1.70

$$-\frac{2\,(9\,A^2-6\,AB+2\,B^2)b^3c^3-27\,(2\,A^2-2\,AB+B^2)ab^2c^2d+54\,(A^2-2\,AB+2\,B^2)a^2bcd^2-(18\,A^2-66\,AB+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x, algorithm="fricas
")
```

```
[Out] -1/54*(2*(9*A^2 - 6*A*B + 2*B^2)*b^3*c^3 - 27*(2*A^2 - 2*A*B + B^2)*a*b^2*c
^2*d + 54*(A^2 - 2*A*B + 2*B^2)*a^2*b*c*d^2 - (18*A^2 - 66*A*B + 85*B^2)*a^
3*d^3 - 6*((6*A*B - 11*B^2)*b^3*c*d^2 - (6*A*B - 11*B^2)*a*b^2*d^3)*x^2 + 1
8*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3
- 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((d*e*x + c*e)/(b*x + a))^2 + 3
*((6*A*B - 5*B^2)*b^3*c^2*d - 18*(2*A*B - 3*B^2)*a*b^2*c*d^2 + (30*A*B - 49
*B^2)*a^2*b*d^3)*x + 6*((6*A*B - 11*B^2)*b^3*d^3*x^3 + 2*(3*A*B - B^2)*b^3*
c^3 - 9*(2*A*B - B^2)*a*b^2*c^2*d + 18*(A*B - B^2)*a^2*b*c*d^2 - 3*(2*B^2*b
^3*c*d^2 - 3*(2*A*B - 3*B^2)*a*b^2*d^3)*x^2 + 3*(B^2*b^3*c^2*d - 6*B^2*a*b^
2*c*d^2 + 6*(A*B - B^2)*a^2*b*d^3)*x)*log((d*e*x + c*e)/(b*x + a)))/((b^7*c
^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3
- 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3
 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 -
3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [A] time = 2.74, size = 760, normalized size = 1.90

$$-\frac{\Bigg(\frac{54\,(dxe+ce)B^2d^2e^2\log\Big(\frac{dxe+ce}{bx+a}\Big)^2}{bx+a}-\frac{54\,(dxe+ce)^2B^2bde\log\Big(\frac{dxe+ce}{bx+a}\Big)^2}{(bx+a)^2}+\frac{108\,(dxe+ce)ABd^2e^2\log\Big(\frac{dxe+ce}{bx+a}\Big)}{bx+a}-\frac{108\,(dxe+ce)B^2d^2e^2\log\Big(\frac{dxe+ce}{bx+a}\Big)}{bx+a}-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] -1/54*(54*(d*x*e + c*e)*B^2*d^2*e^2*log((d*x*e + c*e)/(b*x + a))^2/(b*x + a
) - 54*(d*x*e + c*e)^2*B^2*b*d*e*log((d*x*e + c*e)/(b*x + a))^2/(b*x + a)^2
 + 108*(d*x*e + c*e)*A*B*d^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 1
08*(d*x*e + c*e)*B^2*d^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a) - 108*(
d*x*e + c*e)^2*A*B*b*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 54*(d*x
*e + c*e)^2*B^2*b*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x + a)^2 + 18*(d*x*e
+ c*e)^3*B^2*b^2*log((d*x*e + c*e)/(b*x + a))^2/(b*x + a)^3 + 54*(d*x*e + c
*e)*A^2*d^2*e^2/(b*x + a) - 108*(d*x*e + c*e)*A*B*d^2*e^2/(b*x + a) + 108*(
d*x*e + c*e)*B^2*d^2*e^2/(b*x + a) - 54*(d*x*e + c*e)^2*A^2*b*d*e/(b*x + a)
^2 + 54*(d*x*e + c*e)^2*A*B*b*d*e/(b*x + a)^2 - 27*(d*x*e + c*e)^2*B^2*b*d*
e/(b*x + a)^2 + 36*(d*x*e + c*e)^3*A*B*b^2*log((d*x*e + c*e)/(b*x + a))/(b*
```

```
x + a)^3 - 12*(d*x*e + c*e)^3*B^2*b^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a
)^3 + 18*(d*x*e + c*e)^3*A^2*b^2/(b*x + a)^3 - 12*(d*x*e + c*e)^3*A*B*b^2/(
b*x + a)^3 + 4*(d*x*e + c*e)^3*B^2*b^2/(b*x + a)^3)*(b*c/((b*c*e - a*d*e)*(
b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^2*c^2*g^4*e^2 - 2*a*b*c
*d*g^4*e^2 + a^2*d^2*g^4*e^2)
```

maple [B] time = 0.05, size = 2758, normalized size = 6.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)/(b*x+a)*e)+A)^2/(b*g*x+a*g)^4,x)
```

```
[Out] -2/3/(a*d-b*c)^4/g^4*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3*c-11/9/b/(a*
d-b*c)^4/g^4*B^2*d^4/(b*x+a)*a^2-11/9*b/(a*d-b*c)^4/g^4*B^2*d^2/(b*x+a)*c^2
-1/3/b/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*a^4*d^4-11/9/b/(a*d-b*c)^4/g^4*B^2*ln(
1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^4*a+1/3/b/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(
a*d-b*c)/(b*x+a)/b*e)^2*d^4*a+2/9*b^3/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b
*c)/(b*x+a)/b*e)/(b*x+a)^3*c^4-1/3*b^3/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-
b*c)/(b*x+a)/b*e)^2/(b*x+a)^3*c^4+85/54/b/(a*d-b*c)^4/g^4*B^2*d^4*a-85/54/(
a*d-b*c)^4/g^4*B^2*d^3*c-11/9/b/(a*d-b*c)^4/g^4*A*B*d^4*a+11/9/(a*d-b*c)^4/
g^4*A*B*d^3*c+2/3*b/(a*d-b*c)^4/g^4*A*B*d^2/(b*x+a)*c^2-2/27*b^3/(a*d-b*c)^
4/g^4*B^2/(b*x+a)^3*c^4-1/3*b^3/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*c^4-1/3/(a*d-
b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*d^3*c+11/9/(a*d-b*c)^4/g
^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3*c+2/9/b/(a*d-b*c)^4/g^4*B^2*ln
(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*a^4*d^4+2/3*b/(a*d-b*c)^4/g^4*B^2
*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2/(b*x+a)*c^2-4/9*b/(a*d-b*c)^4/g^4*B^
2/(b*x+a)^3*a^2*d^2*c^2-2/3*b^3/(a*d-b*c)^4/g^4*A*B*ln(1/b*d*e-(a*d-b*c)/(b
*x+a)/b*e)/(b*x+a)^3*c^4+2/3/b/(a*d-b*c)^4/g^4*A*B*ln(1/b*d*e-(a*d-b*c)/(b*
x+a)/b*e)*d^4*a+1/3/b/(a*d-b*c)^4/g^4*A*B*d^4/(b*x+a)^2*a^3+8/27*b^2/(a*d-b
*c)^4/g^4*B^2/(b*x+a)^3*c^3*a*d+1/3/b/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b
*c)/(b*x+a)/b*e)*d^4/(b*x+a)^2*a^3-1/3*b^2/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(
a*d-b*c)/(b*x+a)/b*e)*d/(b*x+a)^2*c^3+2/3/b/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-
(a*d-b*c)/(b*x+a)/b*e)*d^4/(b*x+a)*a^2+4/3/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(
a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^3*a^3*d^3*c-8/9/(a*d-b*c)^4/g^4*B^2*ln(1/b*
d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*a^3*d^3*c+1/3/b/(a*d-b*c)^4/g^4*A^2*d^
4*a-1/3/(a*d-b*c)^4/g^4*A^2*d^3*c+5/18*b^2/(a*d-b*c)^4/g^4*B^2*d/(b*x+a)^2*
c^3-5/18/b/(a*d-b*c)^4/g^4*B^2*d^4/(b*x+a)^2*a^3+2/9*b^3/(a*d-b*c)^4/g^4*A*
B/(b*x+a)^3*c^4-2/27/b/(a*d-b*c)^4/g^4*B^2/(b*x+a)^3*a^4*d^4+22/9/(a*d-b*c)
^4/g^4*B^2*d^3/(b*x+a)*a*c+4/3/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*a^3*d^3*c-4/3/
(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(b*x+a)*a*c-1/(a*
d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(b*x+a)^2*a^2*c-1/3/
b/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^3*a^4*d^4
+2/9/b/(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a^4*d^4+2/3/b/(a*d-b*c)^4/g^4*A*B*d^4/
(b*x+a)*a^2-1/3*b^2/(a*d-b*c)^4/g^4*A*B*d/(b*x+a)^2*c^3-5/6*b/(a*d-b*c)^4/g
^4*B^2*d^2/(b*x+a)^2*c^2*a-1/(a*d-b*c)^4/g^4*A*B*d^3/(b*x+a)^2*a^2*c+4/3*b^
2/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*c^3*a*d-4/3/(a*d-b*c)^4/g^4*A*B*d^3/(b*x+a)
*c*a-8/9/(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a^3*d^3*c-2*b/(a*d-b*c)^4/g^4*A^2/(b
*x+a)^3*a^2*d^2*c^2-8/9*b^2/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a
)/b*e)/(b*x+a)^3*c^3*a*d+b/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)
/b*e)*d^2/(b*x+a)^2*c^2*a+b/(a*d-b*c)^4/g^4*A*B*d^2/(b*x+a)^2*a*c^2+8/27/(a
*d-b*c)^4/g^4*B^2/(b*x+a)^3*a^3*d^3*c+5/6/(a*d-b*c)^4/g^4*B^2*d^3/(b*x+a)^2
*a^2*c+8/3*b^2/(a*d-b*c)^4/g^4*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a
)^3*a*d*c^3-4*b/(a*d-b*c)^4/g^4*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+
a)^3*a^2*d^2*c^2-8/9*b^2/(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a*d*c^3+4/3*b^2/(a*d
-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^3*c^3*a*d-2/3/b
/(a*d-b*c)^4/g^4*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*a^4*d^4-2*
b/(a*d-b*c)^4/g^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^3*a^2*d^2
*c^2+4/3*b/(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a^2*d^2*c^2+8/3/(a*d-b*c)^4/g^4*A*
```

```
B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*a^3*d^3*c+4/3*b/(a*d-b*c)^4/g
^4*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^3*a^2*d^2*c^2
```

maxima [B] time = 2.17, size = 1420, normalized size = 3.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x, algorithm="maxima
")
```

```
[Out] 1/54*(6*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^
3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4
) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*
d^3)*g^4))*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - (4*b^3*c^3 - 27*a*b^2*c^2
*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^
3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*
(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 -
3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b
^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33
*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3
*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^
4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^
4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b
^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x
^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b
^2*d^3*g^4)*x))*B^2 + 1/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*
a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)
*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4
*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
a^5*b*d^2)*g^4) - 6*log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^4*g^4*x^3 + 3*a
*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3
- 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((
b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*log(
d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*
g^4*x + a^3*b*g^4)
```

mupad [B] time = 7.70, size = 1064, normalized size = 2.67

$$\frac{\frac{18\,A^2\,a^2\,d^2-36\,A^2\,a\,b\,c\,d+18\,A^2\,b^2\,c^2-66\,A\,B\,a^2\,d^2+42\,A\,B\,a\,b\,c\,d-12\,A\,B\,b^2\,c^2+85\,B^2\,a^2\,d^2-23\,B^2\,a\,b\,c\,d+4\,B^2\,b^2\,c^2}{6\,(a\,d-b\,c)}+\frac{x\,\left(-5\,c\,B^2\,b^2\,d+49\,a\,B^2\,b\,d^2+6\,A\right.}{2\,(a\,d-b\,c}}{x\,\left(27\,a^2\,b^3\,c\,g^4-27\,a^3\,b^2\,d\,g^4\right)-x^2\,\left(27\,a^2\,b^3\,d\,g^4-27\,a\,b^4\,c\,g^4\right)+x^3\,\left(9\,b^5\,c\,g^4-9\,a\,b^4\,d\,g^4\right)+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))^2/(a*g + b*g*x)^4,x)
```

```
[Out] ((18*A^2*a^2*d^2 + 18*A^2*b^2*c^2 + 85*B^2*a^2*d^2 + 4*B^2*b^2*c^2 - 66*A*B
*a^2*d^2 - 12*A*B*b^2*c^2 - 36*A^2*a*b*c*d - 23*B^2*a*b*c*d + 42*A*B*a*b*c*
d)/(6*(a*d - b*c)) + (x*(49*B^2*a*b*d^2 - 5*B^2*b^2*c*d - 30*A*B*a*b*d^2 +
6*A*B*b^2*c*d))/(2*(a*d - b*c)) + (d*x^2*(11*B^2*b^2*d - 6*A*B*b^2*d))/(a*d
 - b*c))/(x*(27*a^2*b^3*c*g^4 - 27*a^3*b^2*d*g^4) - x^2*(27*a^2*b^3*d*g^4 -
 27*a*b^4*c*g^4) + x^3*(9*b^5*c*g^4 - 9*a*b^4*d*g^4) + 9*a^3*b^2*c*g^4 - 9*
a^4*b*d*g^4) - log((e*(c + d*x))/(a + b*x))^2*(B^2/(3*b^2*g^4*(3*a^2*x + a^
```

```
3/b + b^2*x^3 + 3*a*b*x^2)) - (B^2*d^3)/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b
^2*c^2*d - 3*a^2*b*c*d^2))) - (log((e*(c + d*x))/(a + b*x))*((2*A*B)/(3*b^2
*d*g^4) - (2*B^2*d^3*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(
a*d - b*c))/(3*b*d^2)) + (3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d - 6*a^2*b*c*d
^2)/(3*b*d^4)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2
)) + (2*B^2*d^3*x^2*((b^2*c - a*b*d)/(3*d^2) - (2*b*(a*d - b*c))/(3*d^2)))/
(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (2*B^2*d^3*
x*(b*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(3*b*d^
2)) + (3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*d^3) + (2*a*(a*d - b*c))/(3*d^2)
))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))))/((3*a^2*
x)/d + a^3/(b*d) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (B*d^3*atan((B*d^3*((b^4*
c^3*g^4 + a^3*b*d^3*g^4 - a*b^3*c^2*d*g^4 - a^2*b^2*c*d^2*g^4)/(b^3*c^2*g^4
 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4) + 2*b*d*x)*(6*A - 11*B)*(b^3*c^2*g^4 +
a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4)*1i)/(b*g^4*(a*d - b*c)^3*(11*B^2*d^3 - 6*A
*B*d^3)))*(6*A - 11*B)*2i)/(9*b*g^4*(a*d - b*c)^3)
```

sympy [B] time = 34.71, size = 1544, normalized size = 3.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] B*d**3*(6*A - 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B*b*c*d**3 - 11*B**2*a*d**4
 - 11*B**2*b*c*d**3 - B*a**4*d**7*(6*A - 11*B)/(a*d - b*c)**3 + 4*B*a**3*b*
c*d**6*(6*A - 11*B)/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5*(6*A - 11*B)/(
a*d - b*c)**3 + 4*B*a*b**3*c**3*d**4*(6*A - 11*B)/(a*d - b*c)**3 - B*b**4*c
**4*d**3*(6*A - 11*B)/(a*d - b*c)**3)/(12*A*B*b*d**4 - 22*B**2*b*d**4))/(9*
b*g**4*(a*d - b*c)**3) - B*d**3*(6*A - 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B*
b*c*d**3 - 11*B**2*a*d**4 - 11*B**2*b*c*d**3 + B*a**4*d**7*(6*A - 11*B)/(a*
d - b*c)**3 - 4*B*a**3*b*c*d**6*(6*A - 11*B)/(a*d - b*c)**3 + 6*B*a**2*b**2
*c**2*d**5*(6*A - 11*B)/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4*(6*A - 11*B)/
(a*d - b*c)**3 + B*b**4*c**4*d**3*(6*A - 11*B)/(a*d - b*c)**3)/(12*A*B*b*d*
*4 - 22*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3*B**2*a**2*c*d**2 + 3*B
**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**3*x**2 + B**2*b**2*c**3
 + B**2*b**2*d**3*x**3)*log(e*(c + d*x)/(a + b*x))**2/(3*a**6*d**3*g**4 - 9
*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9*a**4*b**2*c**2*d*g**4 - 27*a
**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4*x**2 - 3*a**3*b**3*c**3*g**4
 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c*d**2*g**4*x**2 + 3*a**3*b**3
*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27*a**2*b**4*c**2*d*g**4*x**2 -
 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*g**4*x**2 + 9*a*b**5*c**2*d*g
**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a**2*d**2 + 12*A*B*a*b*c*d - 6*
A*B*b**2*c**2 + 11*B**2*a**2*d**2 - 7*B**2*a*b*c*d + 15*B**2*a*b*d**2*x + 2
*B**2*b**2*c**2 - 3*B**2*b**2*c*d*x + 6*B**2*b**2*d**2*x**2)*log(e*(c + d*x
)/(a + b*x))/(9*a**5*b*d**2*g**4 - 18*a**4*b**2*c*d*g**4 + 27*a**4*b**2*d**
2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*a**3*b**3*c*d*g**4*x + 27*a**3*b**3*d
**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4*x - 54*a**2*b**4*c*d*g**4*x**2 + 9*a
**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c**2*g**4*x**2 - 18*a*b**5*c*d*g**4*x**
3 + 9*b**6*c**2*g**4*x**3) - (18*A**2*a**2*d**2 - 36*A**2*a*b*c*d + 18*A**2
*b**2*c**2 - 66*A*B*a**2*d**2 + 42*A*B*a*b*c*d - 12*A*B*b**2*c**2 + 85*B**2
*a**2*d**2 - 23*B**2*a*b*c*d + 4*B**2*b**2*c**2 + x**2*(-36*A*B*b**2*d**2 +
 66*B**2*b**2*d**2) + x*(-90*A*B*a*b*d**2 + 18*A*B*b**2*c*d + 147*B**2*a*b*
d**2 - 15*B**2*b**2*c*d))/(54*a**5*b*d**2*g**4 - 108*a**4*b**2*c*d*g**4 + 5
4*a**3*b**3*c**2*g**4 + x**3*(54*a**2*b**4*d**2*g**4 - 108*a*b**5*c*d*g**4
+ 54*b**6*c**2*g**4) + x**2*(162*a**3*b**3*d**2*g**4 - 324*a**2*b**4*c*d*g*
*4 + 162*a*b**5*c**2*g**4) + x*(162*a**4*b**2*d**2*g**4 - 324*a**3*b**3*c*d
*g**4 + 162*a**2*b**4*c**2*g**4))
```

3.190 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=498

$$\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^4}-\frac{2b^2Bd(c+dx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^4}+\frac{Bd^4\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bg^5(bc-ad)^4}-$$

```
[Out] 2*B^2*d^3*(d*x+c)/(-a*d+b*c)^4/g^5/(b*x+a)-3/4*b*B^2*d^2*(d*x+c)^2/(-a*d+b*
c)^4/g^5/(b*x+a)^2+2/9*b^2*B^2*d*(d*x+c)^3/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/32*
b^3*B^2*(d*x+c)^4/(-a*d+b*c)^4/g^5/(b*x+a)^4-1/4*B^2*d^4*ln((d*x+c)/(b*x+a)
)^2/b/(-a*d+b*c)^4/g^5-2*B*d^3*(d*x+c)*(A+B*ln(e*(d*x+c)/(b*x+a)))/(-a*d+b*
c)^4/g^5/(b*x+a)+3/2*b*B*d^2*(d*x+c)^2*(A+B*ln(e*(d*x+c)/(b*x+a)))/(-a*d+b*
c)^4/g^5/(b*x+a)^2-2/3*b^2*B*d*(d*x+c)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))/(-a*d+
b*c)^4/g^5/(b*x+a)^3+1/8*b^3*B*(d*x+c)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))/(-a*d+
b*c)^4/g^5/(b*x+a)^4+1/2*B*d^4*ln((d*x+c)/(b*x+a))*(A+B*ln(e*(d*x+c)/(b*x+a
)))/b/(-a*d+b*c)^4/g^5-1/4*(A+B*ln(e*(d*x+c)/(b*x+a)))^2/b/g^5/(b*x+a)^4
```

Rubi [C] time = 1.26, antiderivative size = 763, normalized size of antiderivative = 1.53, number of steps used = 38, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}+\frac{B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)\,\Big(}{2bg^5(b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(32*b*g^5*(a + b*x)^4) + (7*B^2*d)/(72*b*(b*c - a*d)*g^5*(a + b*x)^3)
- (13*B^2*d^2)/(48*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(24*b*(b
*c - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(24*b*(b*c - a*d)^4*
g^5) - (B^2*d^4*Log[a + b*x]^2)/(4*b*(b*c - a*d)^4*g^5) - (25*B^2*d^4*Log[c
 + d*x])/(24*b*(b*c - a*d)^4*g^5) + (B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B^2*d^4*Log[c + d*x]^2)/(4*b*(
b*c - a*d)^4*g^5) + (B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
2*b*(b*c - a*d)^4*g^5) + (B*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(8*b*g^5*
(a + b*x)^4) - (B*d*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(6*b*(b*c - a*d)*
g^5*(a + b*x)^3) + (B*d^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(4*b*(b*c -
 a*d)^2*g^5*(a + b*x)^2) - (B*d^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*
b*(b*c - a*d)^3*g^5*(a + b*x)) - (B*d^4*Log[a + b*x]*(A + B*Log[(e*(c + d*x
))/(a + b*x)]))/(2*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x]*(A + B*Log[(e
*(c + d*x))/(a + b*x)]))/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x))
/(a + b*x)])^2/(4*b*g^5*(a + b*x)^4) + (B^2*d^4*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^5}\,dx &= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int\frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}\\
&= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^5(c+dx)}\,dx}{2bg^5}\\
&= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^5}-\frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)^2(a+bx)^4}-\right.}{}\\
&= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^5}\,dx}{2g^5}+\frac{\left(Bd^4\right)\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{2(bc-ad)^4g^5}-\\
&= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{8bg^5(a+bx)^4}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2}-\\
&= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{8bg^5(a+bx)^4}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2}-\\
&= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{8bg^5(a+bx)^4}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2}-\\
&= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24b(bc}\\
&= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24b(bc}\\
&= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24b(bc}\\
&= -\frac{B^2}{32bg^5(a+bx)^4}+\frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2}+\frac{}{24b(bc}
\end{aligned}$$

Mathematica [C] time = 0.92, size = 748, normalized size = 1.50

$$\frac{B\left(-144d^4(a+bx)^4\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+144d^4(a+bx)^4\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+144d^3(a+bx)^3(ad-bc)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+72d^2(a+bx)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] (-72*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(144*B*d^3*(a + b*x)^3*(b*
c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 36*B*d^2*(
a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^
2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 8*B*d*(a + b*x)*(2*(b*c
- a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*
d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 3*B*(3*(b*
c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)
^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] +
12*d^4*(a + b*x)^4*Log[c + d*x]) + 36*(b*c - a*d)^4*(A + B*Log[(e*(c + d*x)
)/(a + b*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(c + d*x))/(a
 + b*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a +
b*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b
*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)
]) + 144*d^4*(a + b*x)^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)])
- 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b
*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 72*B*d^4*(a + b
*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^4)/(288*b*g^5*(a + b
*x)^4)
```

fricas [B] time = 0.60, size = 1045, normalized size = 2.10

$$-\frac{9\,(8\,A^2-4\,AB+B^2)b^4c^4-32\,(9\,A^2-6\,AB+2\,B^2)ab^3c^3d+216\,(2\,A^2-2\,AB+B^2)a^2b^2c^2d^2-288\,(A^2-2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x, algorithm="fricas
")
```

```
[Out] -1/288*(9*(8*A^2 - 4*A*B + B^2)*b^4*c^4 - 32*(9*A^2 - 6*A*B + 2*B^2)*a*b^3*
c^3*d + 216*(2*A^2 - 2*A*B + B^2)*a^2*b^2*c^2*d^2 - 288*(A^2 - 2*A*B + 2*B^
2)*a^3*b*c*d^3 + (72*A^2 - 300*A*B + 415*B^2)*a^4*d^4 + 12*((12*A*B - 25*B^
2)*b^4*c*d^3 - (12*A*B - 25*B^2)*a*b^3*d^4)*x^3 - 6*((12*A*B - 13*B^2)*b^4*
c^2*d^2 - 16*(6*A*B - 11*B^2)*a*b^3*c*d^3 + (84*A*B - 163*B^2)*a^2*b^2*d^4)
*x^2 - 72*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 +
4*B^2*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2
 + 4*B^2*a^3*b*c*d^3)*log((d*e*x + c*e)/(b*x + a))^2 + 4*((12*A*B - 7*B^2)*
b^4*c^3*d - 12*(6*A*B - 5*B^2)*a*b^3*c^2*d^2 + 108*(2*A*B - 3*B^2)*a^2*b^2*
c*d^3 - (156*A*B - 271*B^2)*a^3*b*d^4)*x - 12*((12*A*B - 25*B^2)*b^4*d^4*x^
4 - 3*(4*A*B - B^2)*b^4*c^4 + 16*(3*A*B - B^2)*a*b^3*c^3*d - 36*(2*A*B - B^
2)*a^2*b^2*c^2*d^2 + 48*(A*B - B^2)*a^3*b*c*d^3 - 4*(3*B^2*b^4*c*d^3 - 2*(6
*A*B - 11*B^2)*a*b^3*d^4)*x^3 + 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + 6*
(2*A*B - 3*B^2)*a^2*b^2*d^4)*x^2 - 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 +
 18*B^2*a^2*b^2*c*d^3 - 12*(A*B - B^2)*a^3*b*d^4)*x)*log((d*e*x + c*e)/(b*x
 + a)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a
^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 -
4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d +
 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^
4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^
5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3
+ a^8*b*d^4)*g^5)
```

giac [B] time = 2.34, size = 1029, normalized size = 2.07

$$\left(\frac{288\,(dxe+ce)B^2d^3e^3\log\left(\frac{dxe+ce}{bx+a}\right)^2}{bx+a}-\frac{432\,(dxe+ce)^2B^2bd^2e^2\log\left(\frac{dxe+ce}{bx+a}\right)^2}{(bx+a)^2}+\frac{288\,(dxe+ce)^3B^2b^2de\log\left(\frac{dxe+ce}{bx+a}\right)^2}{(bx+a)^3}+\frac{576\,(dxe+ce)ABd^3e^3\log\left(\frac{dxe+}{bx+}\right.}{bx+a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] 1/288*(288*(d*x*e + c*e)*B^2*d^3*e^3*log((d*x*e + c*e)/(b*x + a))^2/(b*x +
a) - 432*(d*x*e + c*e)^2*B^2*b*d^2*e^2*log((d*x*e + c*e)/(b*x + a))^2/(b*x
+ a)^2 + 288*(d*x*e + c*e)^3*B^2*b^2*d*e*log((d*x*e + c*e)/(b*x + a))^2/(b*
x + a)^3 + 576*(d*x*e + c*e)*A*B*d^3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x
+ a) - 576*(d*x*e + c*e)*B^2*d^3*e^3*log((d*x*e + c*e)/(b*x + a))/(b*x + a)
 - 864*(d*x*e + c*e)^2*A*B*b*d^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x + a)
^2 + 432*(d*x*e + c*e)^2*B^2*b*d^2*e^2*log((d*x*e + c*e)/(b*x + a))/(b*x +
a)^2 + 576*(d*x*e + c*e)^3*A*B*b^2*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x +
a)^3 - 192*(d*x*e + c*e)^3*B^2*b^2*d*e*log((d*x*e + c*e)/(b*x + a))/(b*x +
a)^3 - 72*(d*x*e + c*e)^4*B^2*b^3*log((d*x*e + c*e)/(b*x + a))^2/(b*x + a)^
4 + 288*(d*x*e + c*e)*A^2*d^3*e^3/(b*x + a) - 576*(d*x*e + c*e)*A*B*d^3*e^3
/(b*x + a) + 576*(d*x*e + c*e)*B^2*d^3*e^3/(b*x + a) - 432*(d*x*e + c*e)^2*
A^2*b*d^2*e^2/(b*x + a)^2 + 432*(d*x*e + c*e)^2*A*B*b*d^2*e^2/(b*x + a)^2 -
 216*(d*x*e + c*e)^2*B^2*b*d^2*e^2/(b*x + a)^2 + 288*(d*x*e + c*e)^3*A^2*b^
2*d*e/(b*x + a)^3 - 192*(d*x*e + c*e)^3*A*B*b^2*d*e/(b*x + a)^3 + 64*(d*x*e
 + c*e)^3*B^2*b^2*d*e/(b*x + a)^3 - 144*(d*x*e + c*e)^4*A*B*b^3*log((d*x*e
+ c*e)/(b*x + a))/(b*x + a)^4 + 36*(d*x*e + c*e)^4*B^2*b^3*log((d*x*e + c*e
)/(b*x + a))/(b*x + a)^4 - 72*(d*x*e + c*e)^4*A^2*b^3/(b*x + a)^4 + 36*(d*x
*e + c*e)^4*A*B*b^3/(b*x + a)^4 - 9*(d*x*e + c*e)^4*B^2*b^3/(b*x + a)^4)*(b
*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^3*
c^3*g^5*e^3 - 3*a*b^2*c^2*d*g^5*e^3 + 3*a^2*b*c*d^2*g^5*e^3 - a^3*d^3*g^5*e
^3)
```

maple [**B**] time = 0.05, size = 3717, normalized size = 7.46

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)/(b*x+a)*e)+A)^2/(b*g*x+a*g)^5,x)
```

```
[Out] -1/4/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*d^4*c+25/24/(a
*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^4*c+1/32*b^4/(a*d-b*c
)^5/g^5*B^2/(b*x+a)^4*c^5+1/4*b^4/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*c^5-5/8/(a*
d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^4*d^4*c-7/72
/b/(a*d-b*c)^5/g^5*B^2*d^5/(b*x+a)^3*a^4-1/8*b^4/(a*d-b*c)^5/g^5*A*B/(b*x+a
)^4*c^5-1/4/b/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a^5*d^5-1/4/(a*d-b*c)^5/g^5*A^2
*d^4*c+1/4/b/(a*d-b*c)^5/g^5*A^2*d^5*a+415/288/b/(a*d-b*c)^5/g^5*B^2*d^5*a-
2/3/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^4/(b*x+a)^3*a^3
*c-13/16*b/(a*d-b*c)^5/g^5*B^2*d^3/(b*x+a)^2*c^2*a-7/12*b/(a*d-b*c)^5/g^5*B
^2*d^3/(b*x+a)^3*a^2*c^2+5/16*b^2/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a^2*d^2*c^3
-5/32*b^3/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a*d*c^4+1/4/b/(a*d-b*c)^5/g^5*A*B*d
^5/(b*x+a)^2*a^3+1/2/b/(a*d-b*c)^5/g^5*A*B*d^5/(b*x+a)*a^2+1/8/b/(a*d-b*c)^
5/g^5*A*B/(b*x+a)^4*a^5*d^5-1/4*b^2/(a*d-b*c)^5/g^5*A*B*d^2/(b*x+a)^2*c^3-5
/16*b/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a^3*d^3*c^2+1/2*b/(a*d-b*c)^5/g^5*A*B*d
^3/(b*x+a)*c^2-3/4/(a*d-b*c)^5/g^5*A*B*d^4/(b*x+a)^2*a^2*c-2/3/(a*d-b*c)^5/
g^5*A*B*d^4/(b*x+a)^3*a^3*c-415/288/(a*d-b*c)^5/g^5*B^2*d^4*c+25/24/(a*d-b*
c)^5/g^5*A*B*d^4*c-25/24/b/(a*d-b*c)^5/g^5*A*B*d^5*a-3/4/(a*d-b*c)^5/g^5*B^
2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^4/(b*x+a)^2*a^2*c-1/(a*d-b*c)^5/g^5*A
*B*d^4/(b*x+a)*a*c+5/2*b^2/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)
/b*e)^2/(b*x+a)^4*a^2*d^2*c^3+5/2/(a*d-b*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/
(b*x+a)/b*e)/(b*x+a)^4*a^4*d^4*c+5/8*b^3/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*
d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a*d*c^4-5/4*b^2/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*
e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^2*d^2*c^3+3/4*b/(a*d-b*c)^5/g^5*A*B*d^
3/(b*x+a)^2*a*c^2-5/2*b^3/(a*d-b*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/
b*e)/(b*x+a)^4*a*d*c^4+5/32/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a^4*d^4*c+7/18/(a
*d-b*c)^5/g^5*B^2*d^4/(b*x+a)^3*a^3*c+7/18*b^2/(a*d-b*c)^5/g^5*B^2*d^2/(b*x
```

```
+a)^3*c^3*a-5/4*b^3/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a*d*c^4+1/6*b^3/(a*d-b*c)
^5/g^5*A*B*d/(b*x+a)^3*c^4+1/6/b/(a*d-b*c)^5/g^5*A*B*d^5/(b*x+a)^3*a^4+5/2*
b^2/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a^2*d^2*c^3-5/8/(a*d-b*c)^5/g^5*A*B/(b*x+
a)^4*a^4*d^4*c-5/2*b/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a^3*d^3*c^2-1/4*b^2/(a*d
-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2/(b*x+a)^2*c^3-1/4/b/(
a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^4*a^5*d^5+1/
8/b/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^5*d^5
-5*b/(a*d-b*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^3*d^
3*c^2+5*b^2/(a*d-b*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4
*a^2*d^2*c^3+b/(a*d-b*c)^5/g^5*A*B*d^3/(b*x+a)^3*a^2*c^2+3/4*b/(a*d-b*c)^5/
g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(b*x+a)^2*a*c^2+b/(a*d-b*c)^5
/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(b*x+a)^3*a^2*c^2-1/2/b/(a*d
-b*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^5*d^5+5/4/(a*
d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^4*a^4*d^4*c+1/
2/b/(a*d-b*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^5*a-1/(a*d-b*c)
^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^4/(b*x+a)*c*a+1/2*b^4/(a*d-b
*c)^5/g^5*A*B*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*c^5+1/6/b/(a*d-b*
c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^5/(b*x+a)^3*a^4+1/2*b/(a*d
-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^3/(b*x+a)*c^2+1/4/b/(a*
d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^5/(b*x+a)^2*a^3+1/6*b^
3/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d/(b*x+a)^3*c^4+1/2
/b/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^5/(b*x+a)*a^2-25
/24/b/(a*d-b*c)^5/g^5*B^2*d^5/(b*x+a)*a^2-13/48/b/(a*d-b*c)^5/g^5*B^2*d^5/(
b*x+a)^2*a^3+13/48*b^2/(a*d-b*c)^5/g^5*B^2*d^2/(b*x+a)^2*c^3+5/4/(a*d-b*c)^
5/g^5*A^2/(b*x+a)^4*a^4*d^4*c+25/12/(a*d-b*c)^5/g^5*B^2*d^4/(b*x+a)*a*c+13/
16/(a*d-b*c)^5/g^5*B^2*d^4/(b*x+a)^2*a^2*c-25/24/b/(a*d-b*c)^5/g^5*B^2*ln(1
/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^5*a+1/4*b^4/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-
(a*d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^4*c^5-1/2/(a*d-b*c)^5/g^5*A*B*ln(1/b*d*e-(
a*d-b*c)/(b*x+a)/b*e)*d^4*c-5/4*b^3/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c
)/(b*x+a)/b*e)^2/(b*x+a)^4*c^4*a*d-5/2*b/(a*d-b*c)^5/g^5*B^2*ln(1/b*d*e-(a*
d-b*c)/(b*x+a)/b*e)^2/(b*x+a)^4*a^3*d^3*c^2-2/3*b^2/(a*d-b*c)^5/g^5*A*B*d^2
/(b*x+a)^3*a*c^3-25/24*b/(a*d-b*c)^5/g^5*B^2*d^3/(b*x+a)*c^2-1/8*b^4/(a*d-b
*c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*c^5+1/4/b/(a*d-b*
c)^5/g^5*B^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)^2*d^5*a-7/72*b^3/(a*d-b*c)^5
/g^5*B^2*d/(b*x+a)^3*c^4-1/32/b/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a^5*d^5-5/4*b
^2/(a*d-b*c)^5/g^5*A*B/(b*x+a)^4*a^2*d^2*c^3-2/3*b^2/(a*d-b*c)^5/g^5*B^2*ln
(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)*d^2/(b*x+a)^3*a*c^3+5/4*b/(a*d-b*c)^5/g^5*B
^2*ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)/(b*x+a)^4*a^3*d^3*c^2+5/8*b^3/(a*d-b*c
)^5/g^5*A*B/(b*x+a)^4*a*d*c^4+5/4*b/(a*d-b*c)^5/g^5*A*B/(b*x+a)^4*a^3*d^3*c
^2
```

<u>maxima</u> [B] time = 2.91, size = 2122, normalized size = 4.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x, algorithm="maxima
")
```

```
[Out] -1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^
2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d
^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*
d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2
*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^
4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(d*e*x/
(b*x + a) + c*e/(b*x + a)) + (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*
```

```
d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(
13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a
)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
 + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^
2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2
*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100
*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b
^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)
*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6
*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a
*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*
g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^
6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5
)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 -
4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 - 1/24*A*B*((12*b^3*d^3*x^3
- 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 -
 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c
^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3
- 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3
 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^
3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 -
 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*log(d*e*x/(b*x +
a) + c*e/(b*x + a))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*
a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d
+ 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x +
c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*
d^4)*g^5)) - 1/4*B^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^5*g^5*x^4 +
4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^
2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^
4*b*g^5)
```

mupad [B] time = 10.94, size = 1880, normalized size = 3.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x))/(a + b*x)))^2/(a*g + b*g*x)^5,x)
```

```
[Out] (log((e*(c + d*x))/(a + b*x))*((B^2*d^4*(a*(a*((4*a^2*d^2 + b^2*c^2 - 5*a*b
*c*d)/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5*a*
b^2*c^2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + (4*a^4*d^4 + b^4*c^4 + 10*a^2*b^2
*c^2*d^2 - 5*a*b^3*c^3*d - 10*a^3*b*c*d^3)/(4*b*d^5)))/(2*b*g^5*(a^4*d^4 +
b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) - (A*B)/(2*b^
2*d*g^5) + (B^2*d^4*x^2*(b*(b*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(12*b*d^3)
 + (a*(a*d - b*c))/(4*b*d^2)) + (4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*d^3) +
 (a*(a*d - b*c))/(2*d^2)) - a*((b^2*c - a*b*d)/(4*d^2) - (b*(a*d - b*c))/(2
*d^2)) + (b^3*c^2 + 4*a^2*b*d^2 - 5*a*b^2*c*d)/(4*d^3)))/(2*b*g^5*(a^4*d^4
+ b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) - (B^2*d^4*
x^3*(b*((b^2*c - a*b*d)/(4*d^2) - (b*(a*d - b*c))/(2*d^2)) + (b^3*c - a*b^2
*d)/(4*d^2)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3
*d - 4*a^3*b*c*d^3)) + (B^2*d^4*x*(b*(a*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/
(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^
2*d - 10*a^2*b*c*d^2)/(12*b*d^4)) + a*(b*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)
/(12*b*d^3) + (a*(a*d - b*c))/(4*b*d^2)) + (4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d
)/(6*d^3) + (a*(a*d - b*c))/(2*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d
 - 10*a^2*b*c*d^2)/(4*d^4)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^
2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3))))/((4*a^3*x)/d + a^4/(b*d) + (b^3*x^4)/
d + (6*a^2*b*x^2)/d + (4*a*b^2*x^3)/d) - log((e*(c + d*x))/(a + b*x))^2*(B^
```

```
2/(4*b^2*g^5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3)) - (B^
2*d^4)/(4*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*
a^3*b*c*d^3))) - ((72*A^2*a^3*d^3 - 72*A^2*b^3*c^3 + 415*B^2*a^3*d^3 - 9*B^
2*b^3*c^3 - 300*A*B*a^3*d^3 + 36*A*B*b^3*c^3 + 216*A^2*a*b^2*c^2*d - 216*A^
2*a^2*b*c*d^2 + 55*B^2*a*b^2*c^2*d - 161*B^2*a^2*b*c*d^2 - 156*A*B*a*b^2*c^
2*d + 276*A*B*a^2*b*c*d^2)/(12*(a*d - b*c)) + (x^2*(163*B^2*a*b^2*d^3 - 13*
B^2*b^3*c*d^2 - 84*A*B*a*b^2*d^3 + 12*A*B*b^3*c*d^2))/(2*(a*d - b*c)) + (x*
(271*B^2*a^2*b*d^3 + 7*B^2*b^3*c^2*d - 53*B^2*a*b^2*c*d^2 - 156*A*B*a^2*b*d
^3 - 12*A*B*b^3*c^2*d + 60*A*B*a*b^2*c*d^2))/(3*(a*d - b*c)) + (d*x^3*(25*B
^2*b^3*d^2 - 12*A*B*b^3*d^2))/(a*d - b*c))/(x*(96*a^3*b^4*c^2*g^5 + 96*a^5*
b^2*d^2*g^5 - 192*a^4*b^3*c*d*g^5) + x^3*(96*a*b^6*c^2*g^5 + 96*a^3*b^4*d^2
*g^5 - 192*a^2*b^5*c*d*g^5) + x^4*(24*b^7*c^2*g^5 + 24*a^2*b^5*d^2*g^5 - 48
*a*b^6*c*d*g^5) + x^2*(144*a^2*b^5*c^2*g^5 + 144*a^4*b^3*d^2*g^5 - 288*a^3*
b^4*c*d*g^5) + 24*a^6*b*d^2*g^5 + 24*a^4*b^3*c^2*g^5 - 48*a^5*b^2*c*d*g^5)
+ (B*d^4*atan((B*d^4*(12*A - 25*B)*(24*b^5*c^4*g^5 - 24*a^4*b*d^4*g^5 - 48*
a*b^4*c^3*d*g^5 + 48*a^3*b^2*c*d^3*g^5)*1i)/(24*b*g^5*(a*d - b*c)^4*(25*B^2
*d^4 - 12*A*B*d^4)) + (B*d^5*x*(12*A - 25*B)*(b^4*c^3*g^5 - a^3*b*d^3*g^5 -
 3*a*b^3*c^2*d*g^5 + 3*a^2*b^2*c*d^2*g^5)*2i)/(g^5*(a*d - b*c)^4*(25*B^2*d^
4 - 12*A*B*d^4)))*(12*A - 25*B)*1i)/(12*b*g^5*(a*d - b*c)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

3.191 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-1), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x] + b^2*g^2*Defer[Int
][x^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx+\left(b^2g^2\right)\int \frac{}{A+}\end{aligned}$$

Mathematica [A] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

fricas [A] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B\log\left(\frac{dex+ce}{bx+a}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((d*e*x + c*e)/(b*x +
a)) + A), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[A]** time = 1.17, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2}}{B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

maxima **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2}}{B\log\left(\frac{(dx+c)e}{bx+a}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)*e/(b*x + a)) + A), x)
```

mupad **[A]** time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2}{A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x))/(a + b*x))),x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x))/(a + b*x))), x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$g^{2}\left(\int \frac{a^{2}}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx+\int \frac{b^{2}x^{2}}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx+\int \frac{2abx}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] g**2*(Integral(a**2/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x) + Inte
gral(b**2*x**2/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x) + Integral(
2*a*b*x/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x))
```

3.192 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$

Optimal. Leaf size=33

$$\text{Int}\left(\frac{ag+bgx}{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-1), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\right)dx\\
&= (ag)\int \frac{1}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx
\end{aligned}$$

Mathematica [A] time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

fricas [A] time = 2.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B\log\left(\frac{dex+ce}{bx+a}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B*log((d*e*x + c*e)/(b*x + a)) + A), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{bgx+ag}{B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
[Out] int((b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx+ag}{B\log\left(\frac{(dx+c)e}{bx+a}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)*e/(b*x + a)) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g+b\,g\,x}{A+B\,\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(c + d*x))/(a + b*x))),x)
[Out] int((a*g + b*g*x)/(A + B*log((e*(c + d*x))/(a + b*x))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int \frac{a}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx+\int \frac{bx}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
[Out] g*(Integral(a/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x) + Integral(b
*x/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x))
```

3.193 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Mathematica [A] time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

fricas [A] time = 1.00, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{dex+ce}{bx+a}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((d*e*x + c*e)/(b*x + a)
)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x)))),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x)))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa+Abx+Ba\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)+Bbx\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Integral(1/(A*a + A*b*x + B*a*log(c*e/(a + b*x) + d*e*x/(a + b*x)) + B*b*x*
log(c*e/(a + b*x) + d*e*x/(a + b*x))), x)/g
```

3.194 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$

Optimal. Leaf size=53

$$-\frac{e^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{Beg^2(bc-ad)}$$

```
[Out] -Ei((A+B*ln(e*(d*x+c)/(b*x+a)))/B)/B/(-a*d+b*c)/e/exp(A/B)/g^2
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Mathematica [A] time = 0.07, size = 50, normalized size = 0.94

$$\frac{e^{-\frac{A}{B}}\text{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{Beg^2(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]]/(B*(-(b*c) + a*d)*e*E^(A/
B)*g^2)
```

fricas [A] time = 0.92, size = 50, normalized size = 0.94

$$-\frac{e^{\left(-\frac{A}{B}\right)}\,\text{log\_integral}\left(\frac{(dex+ce)e^{\frac{A}{B}}}{bx+a}\right)}{(Bbc-Bad)eg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas
")
```

```
[Out] -e^(-A/B)*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a))/((B*b*c - B*a*d)*e*
g^2)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 0.53, size = 69, normalized size = 1.30

$$-\frac{\operatorname{Ei}\left(1,-\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)-\frac{A}{B}\right)\mathrm{e}^{-\frac{A}{B}}}{(ad-bc)\,Be\,g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

```
[Out] -1/e/(a*d-b*c)/g^2/B*exp(-A/B)*Ei(1,-ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)-A/B)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)^{2}\,\left(A+B\,\ln\left(\frac{e\,(c+d\,x)}{a+b\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x)))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x)))), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{2}+2Aabx+Ab^{2}x^{2}+Ba^{2}\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)+2Babx\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)+Bb^{2}x^{2}\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Integral(1/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(c*e/(a + b*x) + d
*e*x/(a + b*x)) + 2*B*a*b*x*log(c*e/(a + b*x) + d*e*x/(a + b*x)) + B*b**2*x
**2*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x)/g**2
```

3.195 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$

Optimal. Leaf size=109

$$\frac{de^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{Beg^3(bc-ad)^2}-\frac{be^{-\frac{2A}{B}}\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)}{Be^2g^3(bc-ad)^2}$$

```
[Out] d*Ei((A+B*ln(e*(d*x+c)/(b*x+a)))/B)/B/(-a*d+b*c)^2/e/exp(A/B)/g^3-b*Ei(2*(A
+B*ln(e*(d*x+c)/(b*x+a)))/B)/B/(-a*d+b*c)^2/e^2/exp(2*A/B)/g^3
```

Rubi [F] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Mathematica [A] time = 0.16, size = 89, normalized size = 0.82

$$\frac{e^{-\frac{2A}{B}}\left(dee^{A/B}\text{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)-b\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)\right)}{Be^2g^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] (d*e*E^(A/B)*ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]] - b*ExpInteg
ralEi[(2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/B])/(B*(b*c - a*d)^2*e^2*E^(
(2*A)/B)*g^3)
```

fricas [A] time = 0.87, size = 129, normalized size = 1.18

$$\frac{\left(dee^{\frac{A}{B}}\,\text{log\_integral}\left(\frac{(dex+ce)e^{\frac{A}{B}}}{bx+a}\right)-b\,\text{log\_integral}\left(\frac{\left(d^2e^2x^2+2\,cde^2x+c^2e^2\right)e^{\left(\frac{2\,A}{B}\right)}}{b^2x^2+2\,abx+a^2}\right)\right)e^{\left(-\frac{2\,A}{B}\right)}}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)e^2g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas
")
```

```
[Out] (d*e*e^(A/B)*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a)) - b*log_integral
((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)*e^(2*A/B)/(b^2*x^2 + 2*a*b*x + a^2))
)*e^(-2*A/B)/((B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*d^2)*e^2*g^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.15, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3} \left(B \ln \left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)/(b*x+a)*e)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3} \left(B \log \left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x)))),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x)))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{A a^{3} + 3 A a^{2} b x + 3 A a b^{2} x^{2} + A b^{3} x^{3} + B a^{3} \log{\left(\frac{c e}{a + b x} + \frac{d e x}{a + b x} \right)} + 3 B a^{2} b x \log{\left(\frac{c e}{a + b x} + \frac{d e x}{a + b x} \right)} + 3 B a b^{2} x^{2} \log{\left(\frac{c e}{a + b x} + \frac{d e x}{a + b x} \right)} + B b^{3} x^{3} \log{\left(\frac{c e}{a + b x} + \frac{d e x}{a + b x} \right)}}\, dx}{g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Integral(1/(A*a**3 + 3*A*a**2*b*x + 3*A*a*b**2*x**2 + A*b**3*x**3 + B*a**3*
log(c*e/(a + b*x) + d*e*x/(a + b*x)) + 3*B*a**2*b*x*log(c*e/(a + b*x) + d*e
*x/(a + b*x)) + 3*B*a*b**2*x**2*log(c*e/(a + b*x) + d*e*x/(a + b*x)) + B*b*
*3*x**3*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x)/g**3
```

3.196 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-2), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x] + b^2*g^2*Defer[I
nt][x^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx+\big(b^2g\end{aligned}$$

Mathematica [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

fricas [A] time = 2.14, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B^2\log\left(\frac{dex+ce}{bx+a}\right)^2+2\,AB\log\left(\frac{dex+ce}{bx+a}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((d*e*x + c*e)/(b*x
+ a))^2 + 2*A*B*log((d*e*x + c*e)/(b*x + a)) + A^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.07, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx+ag\right)^{2}}{\left(B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^{3}dg^{2}x^{4}+a^{3}cg^{2}+\left(b^{3}cg^{2}+3\,ab^{2}dg^{2}\right)x^{3}+3\left(ab^{2}cg^{2}+a^{2}bdg^{2}\right)x^{2}+\left(3\,a^{2}bcg^{2}+a^{3}dg^{2}\right)x}{(bc-ad)B^{2}\log\left(bx+a\right)-(bc-ad)B^{2}\log\left(dx+c\right)-(bc-ad)AB-\left(bc\log(e)-ad\log(e)\right)B^{2}}+\int\frac{4\,b^{3}}{(bc-ad)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] -(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^2*c*
g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/((b*c - a*d)*B^2*lo
g(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*log(e) -
 a*d*log(e))*B^2) + integrate((4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2 + a^3*d*g^2
+ 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*g^2)*x)/((b*
c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B
- (b*c*log(e) - a*d*log(e))*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2}{{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x))/(a + b*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x))/(a + b*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

3.197 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=33

$$\text{Int}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-2), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.97, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

fricas [A] time = 0.81, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(\frac{dex+ce}{bx+a}\right)^2+2\,AB\log\left(\frac{dex+ce}{bx+a}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((d*e*x + c*e)/(b*x + a))^2 + 2*A*B*log((d*e
*x + c*e)/(b*x + a)) + A^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{bgx+ag}{\left(B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^{2}dgx^{3}+a^{2}cg+\left(b^{2}cg+2\,abdg\right)x^{2}+\left(2\,abcg+a^{2}dg\right)x}{(bc-ad)B^{2}\log\left(bx+a\right)-(bc-ad)B^{2}\log\left(dx+c\right)-(bc-ad)AB-\left(bc\log(e)-ad\log(e)\right)B^{2}}+\int\frac{}{(bc-ad)B^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima")
```

```
[Out] -(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*d*g)
*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) - (b*c - a
*d)*A*B - (b*c*log(e) - a*d*log(e))*B^2) + integrate((3*b^2*d*g*x^2 + 2*a*b
*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/((b*c - a*d)*B^2*log(b*x + a) -
 (b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*log(e) - a*d*log(e))
*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g+b\,g\,x}{{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(c + d*x))/(a + b*x)))^2,x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(c + d*x))/(a + b*x)))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{-a^{2}cg-a^{2}dgx-2abcgx-2abdgx^{2}-b^{2}cgx^{2}-b^{2}dgx^{3}}{ABad-ABbc+\left(B^{2}ad-B^{2}bc\right)\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{g\left(\int\frac{a^{2}d}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx+\int\frac{2abc}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx+\int\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] (-a**2*c*g - a**2*d*g*x - 2*a*b*c*g*x - 2*a*b*d*g*x**2 - b**2*c*g*x**2 - b*
*2*d*g*x**3)/(A*B*a*d - A*B*b*c + (B**2*a*d - B**2*b*c)*log(e*(c + d*x)/(a
+ b*x))) + g*(Integral(a**2*d/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))),
 x) + Integral(2*a*b*c/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x) + I
ntegral(2*b**2*c*x/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x) + Integ
ral(3*b**2*d*x**2/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x) + Integr
al(4*a*b*d*x/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))), x))/(B*(a*d - b*
c))
```

3.198 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

fricas [A] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{dex+ce}{bx+a}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{dex+ce}{bx+a}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d*e*x + c*e)/(
b*x + a))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((d*e*x + c*e)/(b*x + a))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)*e/(b*x + a)) + A)^2), x)
```

maple [A] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$d\int \frac{1}{\left(bcg-adg\right)B^{2}\log\left(bx+a\right)-\left(bcg-adg\right)B^{2}\log\left(dx+c\right)-\left(bcg-adg\right)AB-\left(bcg\log(e)-adg\log(e)\right)B^{2}}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] d*integrate(1/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d
*x + c) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2), x) - (d
*x + c)/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d*x + c
) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x)))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x))/(a + b*x)))^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{-c-dx}{ABadg-ABbcg+\left(B^{2}adg-B^{2}bcg\right)\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{d\int \frac{1}{A+B\log\left(\frac{ce}{a+bx}+\frac{dex}{a+bx}\right)}\,dx}{Bg\left(ad-bc\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] (-c - d*x)/(A*B*a*d*g - A*B*b*c*g + (B**2*a*d*g - B**2*b*c*g)*log(e*(c + d*
x)/(a + b*x))) + d*Integral(1/(A + B*log(c*e/(a + b*x) + d*e*x/(a + b*x))),
 x)/(B*g*(a*d - b*c))
```

3.199 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=104

$$\frac{c+dx}{Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}-\frac{e^{-\frac{A}{B}}\operatorname{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{B^2eg^2(bc-ad)}$$

```
[Out] -Ei((A+B*ln(e*(d*x+c)/(b*x+a)))/B)/B^2/(-a*d+b*c)/e/exp(A/B)/g^2+(d*x+c)/B/
(-a*d+b*c)/g^2/(b*x+a)/(A+B*ln(e*(d*x+c)/(b*x+a)))
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}=$ 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.12, size = 88, normalized size = 0.85

$$\frac{\frac{e^{-\frac{A}{B}}\operatorname{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{e}-\frac{B(c+dx)}{(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}}{B^2g^2(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] (ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]]/(e*E^(A/B)) - (B*(c + d*
x))/((a + b*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])))/(B^2*(-(b*c) + a*d)*g
^2)
```

fricas [B] time = 0.57, size = 208, normalized size = 2.00

$$\frac{(Bdex+Bce)e^{\frac{A}{B}}-\Big(Abx+Aa+(Bbx+Ba)\log\left(\frac{dex+ce}{bx+a}\right)\Big)\operatorname{log\_integral}\left(\frac{(dex+ce)e^{\frac{A}{B}}}{bx+a}\right)}{\Big(\big(B^3b^2c-B^3abd\big)eg^2x+\big(B^3abc-B^3a^2d\big)eg^2\Big)e^{\frac{A}{B}}\log\left(\frac{dex+ce}{bx+a}\right)+\Big(\big(AB^2b^2c-AB^2abd\big)eg^2x+\big(AB^2abc-AB^2a^2d\big)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fric
as")
```

```
[Out] ((B*d*e*x + B*c*e)*e^(A/B) - (A*b*x + A*a + (B*b*x + B*a)*log((d*e*x + c*e)
/(b*x + a)))*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a)))/(((B^3*b^2*c -
B^3*a*b*d)*e*g^2*x + (B^3*a*b*c - B^3*a^2*d)*e*g^2)*e^(A/B)*log((d*e*x + c*
e)/(b*x + a)) + ((A*B^2*b^2*c - A*B^2*a*b*d)*e*g^2*x + (A*B^2*a*b*c - A*B^2
*a^2*d)*e*g^2)*e^(A/B))
```

giac [A] time = 1.34, size = 152, normalized size = 1.46

$$\left(\frac{bc}{(bce-ade)(bc-ad)}-\frac{ad}{(bce-ade)(bc-ad)}\right)\left(\frac{dxe+ce}{\left(B^2g^2\log\left(\frac{dxe+ce}{bx+a}\right)+ABg^2\right)(bx+a)}-\frac{\mathrm{Ei}\left(\frac{A}{B}+\log\left(\frac{dxe+ce}{bx+a}\right)\right)e^{(-}}{B^2g^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac
")
```

```
[Out] (b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))*((d
*x*e + c*e)/((B^2*g^2*log((d*x*e + c*e)/(b*x + a)) + A*B*g^2)*(b*x + a)) -
Ei(A/B + log((d*x*e + c*e)/(b*x + a)))*e^(-A/B)/(B^2*g^2))
```

maple [B] time = 0.45, size = 258, normalized size = 2.48

$$\frac{ad}{(ad-bc)\left(\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)+\frac{A}{B}\right)(bx+a)\,B^2b\,g^2}-\frac{c}{(ad-bc)\left(\ln\left(\frac{de}{b}-\frac{(ad-bc)e}{(bx+a)b}\right)+\frac{A}{B}\right)(bx+a)\,B^2g^2}-\frac{\mathrm{Ei}\left(1,-\ln\left(\right.\right.}{(a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] -1/(a*d-b*c)/g^2/B^2/(ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)+A/B)/b*d+1/(a*d-b*c
)/g^2/B^2/(ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)+A/B)/b/(b*x+a)*a*d-1/(a*d-b*c)
/g^2/B^2/(ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)+A/B)/(b*x+a)*c-1/e/(a*d-b*c)/g^
2/B^2*exp(-A/B)*Ei(1,-ln(1/b*d*e-(a*d-b*c)/(b*x+a)/b*e)-A/B)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{}{\left(abcg^2-a^2dg^2\right)AB+\left(abcg^2\log(e)-a^2dg^2\log(e)\right)B^2+\left(\left(b^2cg^2-abdg^2\right)AB+\left(b^2cg^2\log(e)-abdg^2\log(e)\right)B\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxi
ma")
```

```
[Out] (d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2*log(
e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2*log(
e))*B^2)*x - ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^2)*
log(b*x + a) + ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^2
)*log(d*x + c)) + integrate(1/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2 + (B^2*b^2*
g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b*g^2)*x - (B
^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a) + (B^2*b^2*g^2
*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x)))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x))/(a + b*x)))^2), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{-c-dx}{ABa^2dg^2-ABabcg^2+ABabdg^2x-ABb^2cg^2x+\left(B^2a^2dg^2-B^2abcg^2+B^2abdg^2x-B^2b^2cg^2x\right)\log\left(\frac{e(c+dx)}{a+bx}\right)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] (-c - d*x)/(A*B*a**2*d*g**2 - A*B*a*b*c*g**2 + A*B*a*b*d*g**2*x - A*B*b**2*
c*g**2*x + (B**2*a**2*d*g**2 - B**2*a*b*c*g**2 + B**2*a*b*d*g**2*x - B**2*b
**2*c*g**2*x)*log(e*(c + d*x)/(a + b*x))) + Integral(1/(A*a**2 + 2*A*a*b*x
+ A*b**2*x**2 + B*a**2*log(c*e/(a + b*x) + d*e*x/(a + b*x)) + 2*B*a*b*x*log
(c*e/(a + b*x) + d*e*x/(a + b*x)) + B*b**2*x**2*log(c*e/(a + b*x) + d*e*x/(
a + b*x))), x)/(B*g**2)
```

3.200 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=159

$$-\frac{2be^{-\frac{2A}{B}}\,\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)}{B^2e^2g^3(bc-ad)^2}+\frac{de^{-\frac{A}{B}}\,\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{B^2eg^3(bc-ad)^2}+\frac{c+dx}{Bg^3(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}$$

```
[Out] d*Ei((A+B*ln(e*(d*x+c)/(b*x+a)))/B)/B^2/(-a*d+b*c)^2/e/exp(A/B)/g^3-2*b*Ei(
2*(A+B*ln(e*(d*x+c)/(b*x+a)))/B)/B^2/(-a*d+b*c)^2/e^2/exp(2*A/B)/g^3+(d*x+c
)/B/(-a*d+b*c)/g^3/(b*x+a)^2/(A+B*ln(e*(d*x+c)/(b*x+a)))
```

Rubi [F] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.41, size = 135, normalized size = 0.85

$$\frac{-\frac{2be^{-\frac{2A}{B}}\,\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)}{e^2}+\frac{de^{-\frac{A}{B}}\,\text{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{e}+\frac{B(c+dx)(bc-ad)}{(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}}{B^2g^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] ((d*ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]])/(e*E^(A/B)) - (2*b*E
xpIntegralEi[(2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/B])/(e^2*E^((2*A)/B))
 + (B*(b*c - a*d)*(c + d*x))/((a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x
)])))/(B^2*(b*c - a*d)^2*g^3)
```

fricas [B] time = 0.53, size = 584, normalized size = 3.67

$$\frac{((Bbcd-Bad^2)e^2x+(Bbc^2-Bacd)e^2)e^{\left(\frac{2A}{B}\right)}-2(Ab^3x^2+2Aab^2x+Aa^2b+(Bb^3x^2+2Bab^2x+}{((B^3b^4c^2-2B^3ab^3cd+B^3a^2b^2d^2)e^2g^3x^2+2(B^3ab^3c^2-2B^3a^2b^2cd+B^3a^3bd^2)e^2g^3x+(B^3a^2b^2c^2-2B^3a^3bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fric
as")
```

```
[Out] (((B*b*c*d - B*a*d^2)*e^2*x + (B*b*c^2 - B*a*c*d)*e^2)*e^(2*A/B) - 2*(A*b^3
*x^2 + 2*A*a*b^2*x + A*a^2*b + (B*b^3*x^2 + 2*B*a*b^2*x + B*a^2*b)*log((d*e
*x + c*e)/(b*x + a)))*log_integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)*e^
(2*A/B)/(b^2*x^2 + 2*a*b*x + a^2)) + ((B*b^2*d*e*x^2 + 2*B*a*b*d*e*x + B*a^
2*d*e)*e^(A/B)*log((d*e*x + c*e)/(b*x + a)) + (A*b^2*d*e*x^2 + 2*A*a*b*d*e*
x + A*a^2*d*e)*e^(A/B))*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a)))/(((B
^3*b^4*c^2 - 2*B^3*a*b^3*c*d + B^3*a^2*b^2*d^2)*e^2*g^3*x^2 + 2*(B^3*a*b^3*
c^2 - 2*B^3*a^2*b^2*c*d + B^3*a^3*b*d^2)*e^2*g^3*x + (B^3*a^2*b^2*c^2 - 2*B
^3*a^3*b*c*d + B^3*a^4*d^2)*e^2*g^3)*e^(2*A/B)*log((d*e*x + c*e)/(b*x + a))
 + ((A*B^2*b^4*c^2 - 2*A*B^2*a*b^3*c*d + A*B^2*a^2*b^2*d^2)*e^2*g^3*x^2 + 2
*(A*B^2*a*b^3*c^2 - 2*A*B^2*a^2*b^2*c*d + A*B^2*a^3*b*d^2)*e^2*g^3*x + (A*B
^2*a^2*b^2*c^2 - 2*A*B^2*a^3*b*c*d + A*B^2*a^4*d^2)*e^2*g^3)*e^(2*A/B))
```

giac [B] time = 1.83, size = 317, normalized size = 1.99

$$\left(\frac{d\mathrm{Ei}\left(\frac{A}{B}+\log\left(\frac{dxe+ce}{bx+a}\right)\right)e^{\left(-\frac{A}{B}+1\right)}}{B^2bcg^3e-B^2adg^3e}-\frac{2\,b\mathrm{Ei}\left(\frac{2\,A}{B}+2\,\log\left(\frac{dxe+ce}{bx+a}\right)\right)e^{\left(-\frac{2\,A}{B}\right)}}{B^2bcg^3e-B^2adg^3e}-\frac{\frac{(dxe+ce)de}{bx+a}-\frac{(dxe+ce)}{(bx+a)}}{B^2bcg^3e\log\left(\frac{dxe+ce}{bx+a}\right)-B^2adg^3e\log\left(\frac{dxe+c}{bx+a}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac
")
```

```
[Out] (d*Ei(A/B + log((d*x*e + c*e)/(b*x + a)))*e^(-A/B + 1)/(B^2*b*c*g^3*e - B^2
*a*d*g^3*e) - 2*b*Ei(2*A/B + 2*log((d*x*e + c*e)/(b*x + a)))*e^(-2*A/B)/(B^
2*b*c*g^3*e - B^2*a*d*g^3*e) - ((d*x*e + c*e)*d*e/(b*x + a) - (d*x*e + c*e)
^2*b/(b*x + a)^2)/(B^2*b*c*g^3*e*log((d*x*e + c*e)/(b*x + a)) - B^2*a*d*g^3
*e*log((d*x*e + c*e)/(b*x + a)) + A*B*b*c*g^3*e - A*B*a*d*g^3*e))*(b*c/((b*
c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))
```

maple [F] time = 1.49, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\ln\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)/(b*x+a)*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{}{\left(a^2bcg^3-a^3dg^3\right)AB+\left(a^2bcg^3\log(e)-a^3dg^3\log(e)\right)B^2+\left(\left(b^3cg^3-ab^2dg^3\right)AB+\left(b^3cg^3\log(e)-ab^2dg^3\log(e)\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxi
ma")
```

```
[Out] (d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d*g^3*
log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b^2*d*
g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g^3*lo
```

```
g(e) - a^2*b*d*g^3*log(e))*B^2)*x - ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*
(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(b*x
+ a) + ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*B
^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate(-(b*d*x + 2
*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e) - a*b^3*d*g
^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*g^3*log(e) -
 a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B + (a*b^3*c*g^
3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 - a^3*b*d*g^3
)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x - ((b^4*c*g^3 -
a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2
*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*log(b*x + a) +
 ((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x
^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)
*log(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,{\left(A+B\,\ln\left(\frac{e\,\left(c+d\,x\right)}{a+b\,x}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x)))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x))/(a + b*x)))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

3.201 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx$

Optimal. Leaf size=182

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5b}+\frac{2Bg^4(bc-ad)^5\log(c+dx)}{5bd^5}-\frac{2Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}-\frac{2Bg^4}{}$$

```
[Out] -2/5*B*(-a*d+b*c)^4*g^4*x/d^4+1/5*B*(-a*d+b*c)^3*g^4*(b*x+a)^2/b/d^3-2/15*B
*(-a*d+b*c)^2*g^4*(b*x+a)^3/b/d^2+1/10*B*(-a*d+b*c)*g^4*(b*x+a)^4/b/d+2/5*B
*(-a*d+b*c)^5*g^4*ln(d*x+c)/b/d^5+1/5*g^4*(b*x+a)^5*(A+B*ln(e*(d*x+c)^2/(b*
x+a)^2))/b
```

Rubi [A] time = 0.12, antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5b}-\frac{2Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}-\frac{2Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}+\frac{2Bg^4(bc}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (-2*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(5*b
*d^3) - (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) + (B*(b*c - a*d)*g^4
*(a + b*x)^4)/(10*b*d) + (2*B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5) + (
g^4*(a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5b} - \frac{B\int \frac{2(-bc+ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5b} + \frac{\left(2B(bc-ad)g^4\right)\int \frac{(a+bx)^4}{c+dx}\,d}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5b} + \frac{\left(2B(bc-ad)g^4\right)\int \big(-\frac{b(bc-a}{d^4}}{}$$

$$= -\frac{2B(bc-ad)^4g^4x}{5d^4} + \frac{B(bc-ad)^3g^4(a+bx)^2}{5bd^3} - \frac{2B(bc-ad)^2g^4(a}{15bd^2}$$

Mathematica [**A**] time = 0.10, size = 144, normalized size = 0.79

$$\frac{g^4\left(\left(a+bx\right)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-\frac{B(ad-bc)\big(4d^3(a+bx)^3(ad-bc)+6d^2(a+bx)^2(bc-ad)^2-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(}{6d^5}\right.}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g^4*(-1/6*(B*(-(b*c) + a*d)*(-12*b*d*(b*c - a*d)^3*x + 6*d^2*(b*c - a*d)^2
*(a + b*x)^2 + 4*d^3*(-(b*c) + a*d)*(a + b*x)^3 + 3*d^4*(a + b*x)^4 + 12*(b
*c - a*d)^4*Log[c + d*x]))/d^5 + (a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a
+ b*x)^2])))/(5*b)
```

fricas [**B**] time = 0.70, size = 457, normalized size = 2.51

$$\frac{6\,Ab^5d^5g^4x^5 - 12\,Ba^5d^5g^4\log\left(bx+a\right) + 3\left(Bb^5cd^4 + (10\,A-B)ab^4d^5\right)g^4x^4 - 4\big(Bb^5c^2d^3 - 5\,Bab^4cd^4 - (15\,A}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] 1/30*(6*A*b^5*d^5*g^4*x^5 - 12*B*a^5*d^5*g^4*log(b*x + a) + 3*(B*b^5*c*d^4
+ (10*A - B)*a*b^4*d^5)*g^4*x^4 - 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 - (15*
A - 4*B)*a^2*b^3*d^5)*g^4*x^3 + 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 10*B
*a^2*b^3*c*d^4 + 2*(5*A - 3*B)*a^3*b^2*d^5)*g^4*x^2 - 6*(2*B*b^5*c^4*d - 10
*B*a*b^4*c^3*d^2 + 20*B*a^2*b^3*c^2*d^3 - 20*B*a^3*b^2*c*d^4 - (5*A - 8*B)*
a^4*b*d^5)*g^4*x + 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 -
 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 6*(B*b^5*d^5*g^
4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*d^5
*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^
2 + 2*a*b*x + a^2)))/(b*d^5)
```

giac [**B**] time = 78.00, size = 493, normalized size = 2.71

$$-\frac{2\,Ba^5g^4\log\left(bx+a\right)}{5\,b} + \frac{1}{5}\left(Ab^4g^4 + Bb^4g^4\right)x^5 + \frac{\left(Bb^4cg^4 + 10\,Aab^3dg^4 + 9\,Bab^3dg^4\right)x^4}{10\,d} - \frac{2\big(Bb^4c^2g^4 - 5\,Bab^3cd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] -2/5*B*a^5*g^4*log(b*x + a)/b + 1/5*(A*b^4*g^4 + B*b^4*g^4)*x^5 + 1/10*(B*b
^4*c*g^4 + 10*A*a*b^3*d*g^4 + 9*B*a*b^3*d*g^4)*x^4/d - 2/15*(B*b^4*c^2*g^4
- 5*B*a*b^3*c*d*g^4 - 15*A*a^2*b^2*d^2*g^4 - 11*B*a^2*b^2*d^2*g^4)*x^3/d^2
+ 1/5*(B*b^4*g^4*x^5 + 5*B*a*b^3*g^4*x^4 + 10*B*a^2*b^2*g^4*x^3 + 10*B*a^3*
b*g^4*x^2 + 5*B*a^4*g^4*x)*log((d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*x
 + a^2)) + 1/5*(B*b^4*c^3*g^4 - 5*B*a*b^3*c^2*d*g^4 + 10*B*a^2*b^2*c*d^2*g^
4 + 10*A*a^3*b*d^3*g^4 + 4*B*a^3*b*d^3*g^4)*x^2/d^3 - 1/5*(2*B*b^4*c^4*g^4
- 10*B*a*b^3*c^3*d*g^4 + 20*B*a^2*b^2*c^2*d^2*g^4 - 20*B*a^3*b*c*d^3*g^4 -
5*A*a^4*d^4*g^4 + 3*B*a^4*d^4*g^4)*x/d^4 + 2/5*(B*b^4*c^5*g^4 - 5*B*a*b^3*c
^4*d*g^4 + 10*B*a^2*b^2*c^3*d^2*g^4 - 10*B*a^3*b*c^2*d^3*g^4 + 5*B*a^4*c*d^
4*g^4)*log(d*x + c)/d^5
```

maple [**B**] time = 0.13, size = 1030, normalized size = 5.66

$$\frac{B\,b^4g^4x^5\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2e}{b^2}\right)}{5}+\frac{A\,b^4g^4x^5}{5}+Ba\,b^3g^4x^4\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2e}{b^2}\right)+Aa\,b^3g^4x^4+2B\,a^2b^2g^4x^3\ln\left(\left(\frac{ad}{bx+a}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] -5/6/b*g^4*B*a^5+1/5/b*A*a^5*g^4+1/5*b^4*A*x^5*g^4-8/5*B*x*a^4*g^4-2/5/b*g^
4*B*a^5*ln(a/(b*x+a)*d-1/(b*x+a)*b*c-d)+1/5*b^4*B*ln(e*(a/(b*x+a)*d-1/(b*x+
a)*b*c-d)^2/b^2)*x^5*g^4+1/5/b*B*ln(e*(a/(b*x+a)*d-1/(b*x+a)*b*c-d)^2/b^2)*
a^5*g^4+B*ln(e*(a/(b*x+a)*d-1/(b*x+a)*b*c-d)^2/b^2)*x*a^4*g^4+2/5/b*g^4*B*a
^5*ln(1/(b*x+a))-8/15*b^2*B*x^3*a^2*g^4-6/5*b*B*x^2*a^3*g^4+b^3*A*x^4*a*g^4
+2*b^2*A*x^3*a^2*g^4+2*b*A*x^2*a^3*g^4-1/10*b^3*B*x^4*a*g^4+2*b^2*B*ln(e*(a
/(b*x+a)*d-1/(b*x+a)*b*c-d)^2/b^2)*x^3*a^2*g^4+2*b*B*ln(e*(a/(b*x+a)*d-1/(b
*x+a)*b*c-d)^2/b^2)*x^2*a^3*g^4+2*g^4*B*a^4/d*ln(a/(b*x+a)*d-1/(b*x+a)*b*c-
d)*c-2*g^4*B*a^4/d*ln(1/(b*x+a))*c+A*a^4*g^4*x+9/5*b^2*g^4*B*c^3/d^3*a^2-47
/15*b*g^4*B*c^2/d^2*a^3-2/5*b^3*g^4*B*c^4/d^4*a+77/30*g^4*B*c/d*a^4+1/5*b^4
*g^4*B*c^3/d^3*x^2-2/15*b^4*g^4*B*c^2/d^2*x^3-2/5*b^4*g^4*B*c^4/d^4*x+1/10*
b^4*g^4*B*c/d*x^4-2/5*b^4*g^4*B*c^5/d^5*ln(1/(b*x+a))+2/5*b^4*g^4*B*c^5/d^5
*ln(a/(b*x+a)*d-1/(b*x+a)*b*c-d)+b^3*B*ln(e*(a/(b*x+a)*d-1/(b*x+a)*b*c-d)^2
/b^2)*x^4*a*g^4-4*b*g^4*B*a^3/d^2*ln(a/(b*x+a)*d-1/(b*x+a)*b*c-d)*c^2+4*b*g
^4*B*a^3/d^2*ln(1/(b*x+a))*c^2+4*b*g^4*B*c/d*x*a^3+2*b^3*g^4*B*a/d^4*ln(1/(
b*x+a))*c^4-4*b^2*g^4*B*a^2/d^3*ln(1/(b*x+a))*c^3+4*b^2*g^4*B*a^2/d^3*ln(a/
(b*x+a)*d-1/(b*x+a)*b*c-d)*c^3-2*b^3*g^4*B*a/d^4*ln(a/(b*x+a)*d-1/(b*x+a)*b
*c-d)*c^4-b^3*g^4*B*c^2/d^2*x^2*a-4*b^2*g^4*B*c^2/d^2*x*a^2+2*b^3*g^4*B*c^3
/d^3*x*a+2/3*b^3*g^4*B*c/d*x^3*a+2*b^2*g^4*B*c/d*x^2*a^2
```

maxima [**B**] time = 1.40, size = 882, normalized size = 4.85

$$\frac{1}{5}\,Ab^4g^4x^5+Aab^3g^4x^4+2\,Aa^2b^2g^4x^3+2\,Aa^3bg^4x^2+\left(x\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*
b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/b + 2*c*lo
g(d*x + c)/d)*B*a^4*g^4 + 2*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) +
2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*
a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*B*a^
3*b*g^4 + 2*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x
```

```
^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)
/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2
*d^2)*x)/(b^2*d^2))*B*a^2*b^2*g^4 + 1/3*(3*x^4*log(d^2*e*x^2/(b^2*x^2 + 2*a
*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*
x + a^2)) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2
 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x
)/(b^3*d^3))*B*a*b^3*g^4 + 1/30*(6*x^5*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a
^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)
) - 12*a^5*log(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (3*(b^4*c*d^3 - a*b
^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)
*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

mupad [**B**]   time = 4.79, size = 1024, normalized size = 5.63

$$x^2 \left(\frac{(5\,a\,d + 5\,b\,c) \left(\frac{\left(\frac{b^3\,g^4\,(25\,A\,a\,d+5\,A\,b\,c-2\,B\,a\,d+2\,B\,b\,c)}{5\,d} - \frac{A\,b^3\,g^4\,(5\,a\,d+5\,b\,c)}{5\,d} \right) (5\,a\,d+5\,b\,c)}{5\,b\,d} - \frac{a\,b^2\,g^4\,(10\,A\,a\,d+5\,A\,b\,c-2\,B\,a\,d+2\,B\,b\,c)}{d} + \frac{A\,a\,b^3}{d} \right.}{10\,b\,d} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)),x)
```

```
[Out] x^2*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))
/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(5*b*d) - (a*b
^2*g^4*(10*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/d + (A*a*b^3*c*g^4)/d))/(1
0*b*d) + (a^2*b*g^4*(5*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/d - (a*c*((b^3
*g^4*(25*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d +
5*b*c))/(5*d)))/(2*b*d)) - x^3*((((b^3*g^4*(25*A*a*d + 5*A*b*c - 2*B*a*d +
2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(15*b
*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/(3*d) + (A*a*b^3
*c*g^4)/(3*d)) + x*((a^3*g^4*(5*A*a*d + 10*A*b*c - 4*B*a*d + 4*B*b*c))/d -
((5*a*d + 5*b*c)*(((5*a*d + 5*b*c)*((((b^3*g^4*(25*A*a*d + 5*A*b*c - 2*B*a*
d + 2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*(5*a*d + 5*b*c))/(
5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/d + (A*a*b^3*
c*g^4)/d))/(5*b*d) + (2*a^2*b*g^4*(5*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/
d - (a*c*((b^3*g^4*(25*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/(5*d) - (A*b^3
*g^4*(5*a*d + 5*b*c))/(5*d)))/(b*d)))/(5*b*d) + (a*c*((((b^3*g^4*(25*A*a*d
+ 5*A*b*c - 2*B*a*d + 2*B*b*c))/(5*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(5*d))*
(5*a*d + 5*b*c))/(5*b*d) - (a*b^2*g^4*(10*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b
*c))/d + (A*a*b^3*c*g^4)/d))/(b*d)) + log((e*(c + d*x)^2)/(a + b*x)^2)*((B*
b^4*g^4*x^5)/5 + B*a^4*g^4*x + 2*B*a^3*b*g^4*x^2 + B*a*b^3*g^4*x^4 + 2*B*a^
2*b^2*g^4*x^3) + x^4*((b^3*g^4*(25*A*a*d + 5*A*b*c - 2*B*a*d + 2*B*b*c))/(2
0*d) - (A*b^3*g^4*(5*a*d + 5*b*c))/(20*d)) + (log(c + d*x)*((2*B*b^4*c^5*g^
4)/5 + 2*B*a^4*c*d^4*g^4 - 4*B*a^3*b*c^2*d^3*g^4 + 4*B*a^2*b^2*c^3*d^2*g^4
- 2*B*a*b^3*c^4*d*g^4))/d^5 + (A*b^4*g^4*x^5)/5 - (2*B*a^5*g^4*log(a + b*x)
)/(5*b)
```

sympy [**B**]   time = 6.70, size = 998, normalized size = 5.48

$$\frac{Ab^4g^4x^5}{5} - \frac{2Ba^5g^4\log\left(x + \frac{\frac{2Ba^6d^5g^4}{b} + 10Ba^5cd^4g^4 - 20Ba^4bc^2d^3g^4 + 20Ba^3b^2c^3d^2g^4 - 10Ba^2b^3c^4dg^4 + 2Bab^4c^5g^4}{2Ba^5d^5g^4 + 10Ba^4bcd^4g^4 - 20Ba^3b^2c^2d^3g^4 + 20Ba^2b^3c^3d^2g^4 - 10Bab^4c^4dg^4 + 2Bb^5c^5g^4}\right)}{5b} + \frac{2Bcg^4\left(5a^4d^4 - 1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b**4*g**4*x**5/5 - 2*B*a**5*g**4*log(x + (2*B*a**6*d**5*g**4/b + 10*B*a**
5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g**4 + 20*B*a**3*b**2*c**3*d**2*g**4
- 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b**4*c**5*g**4)/(2*B*a**5*d**5*g**4 +
10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g**4 + 20*B*a**2*b**3*c*
*3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**5*g**4))/(5*b) + 2*B*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4)*log(x + (12*B*a**5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g
**4 + 20*B*a**3*b**2*c**3*d**2*g**4 - 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b*
*4*c**5*g**4 - 2*B*a*c*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*
c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4) + 2*B*b*c**2*g**4*(5*a**4*d**4 - 1
0*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/
(2*B*a**5*d**5*g**4 + 10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g*
*4 + 20*B*a**2*b**3*c**3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**
5*g**4))/(5*d**5) + x**4*(A*a*b**3*g**4 - B*a*b**3*g**4/10 + B*b**4*c*g**4/
(10*d)) + x**3*(2*A*a**2*b**2*g**4 - 8*B*a**2*b**2*g**4/15 + 2*B*a*b**3*c*g
**4/(3*d) - 2*B*b**4*c**2*g**4/(15*d**2)) + x**2*(2*A*a**3*b*g**4 - 6*B*a**
3*b*g**4/5 + 2*B*a**2*b**2*c*g**4/d - B*a*b**3*c**2*g**4/d**2 + B*b**4*c**3
*g**4/(5*d**3)) + x*(A*a**4*g**4 - 8*B*a**4*g**4/5 + 4*B*a**3*b*c*g**4/d -
4*B*a**2*b**2*c**2*g**4/d**2 + 2*B*a*b**3*c**3*g**4/d**3 - 2*B*b**4*c**4*g*
*4/(5*d**4)) + (B*a**4*g**4*x + 2*B*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g**4*x
**3 + B*a*b**3*g**4*x**4 + B*b**4*g**4*x**5/5)*log(e*(c + d*x)**2/(a + b*x)
**2)
```

3.202 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx$

Optimal. Leaf size=151

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{4b}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}+\frac{Bg^3x(bc-ad)^3}{2d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}+Bg^3($$

```
[Out] 1/2*B*(-a*d+b*c)^3*g^3*x/d^3-1/4*B*(-a*d+b*c)^2*g^3*(b*x+a)^2/b/d^2+1/6*B*(
-a*d+b*c)*g^3*(b*x+a)^3/b/d-1/2*B*(-a*d+b*c)^4*g^3*ln(d*x+c)/b/d^4+1/4*g^3*
(b*x+a)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b
```

Rubi [A] time = 0.10, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = $\{2525, 12, 43\}$

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{4b}+\frac{Bg^3x(bc-ad)^3}{2d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}+Bg^3($$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(4*b*d^
2) + (B*(b*c - a*d)*g^3*(a + b*x)^3)/(6*b*d) - (B*(b*c - a*d)^4*g^3*Log[c +
 d*x])/(2*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]
))/(4*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4b} - \frac{B\int \frac{2(-bc+ad)g^4(a+bx)^3}{c+dx}\,dx}{4bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4b} + \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3}{c+dx}\,dx}{2b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4b} + \left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2}{d^3} - $$

$$= \frac{B(bc-ad)^3g^3x}{2d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2}{4bd^2} + \frac{B(bc-ad)g^3(a+bx)^3}{6bd}$$

Mathematica [**A**]   time = 0.08, size = 122, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{3d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g^3*((B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x
)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/(3*d^4) + (a + b*x
)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])))/(4*b)
```

fricas [**B**]   time = 0.53, size = 343, normalized size = 2.27

$$3\,Ab^4d^4g^3x^4 - 6\,Ba^4d^4g^3\log(bx+a) + 2\left(Bb^4cd^3 + (6\,A-B)ab^3d^4\right)g^3x^3 - 3\left(Bb^4c^2d^2 - 4\,Bab^3cd^3 - 3\,(2\,A-B)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] 1/12*(3*A*b^4*d^4*g^3*x^4 - 6*B*a^4*d^4*g^3*log(b*x + a) + 2*(B*b^4*c*d^3 +
 (6*A - B)*a*b^3*d^4)*g^3*x^3 - 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - 3*(2*A
 - B)*a^2*b^2*d^4)*g^3*x^2 + 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*b
^2*c*d^3 + (2*A - 3*B)*a^3*b*d^4)*g^3*x - 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 3*(B*b^4*d^4*g^3*
x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*x
)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/(b*d^4)
```

giac [**B**]   time = 18.85, size = 364, normalized size = 2.41

$$-\frac{Ba^4g^3\log(bx+a)}{2\,b} + \frac{1}{4}\left(Ab^3g^3 + Bb^3g^3\right)x^4 + \frac{\left(Bb^3cg^3 + 6\,Aab^2dg^3 + 5\,Bab^2dg^3\right)x^3}{6\,d} + \frac{1}{4}\left(Bb^3g^3x^4 + 4\,Bab^2g^3x^3 + $$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] -1/2*B*a^4*g^3*log(b*x + a)/b + 1/4*(A*b^3*g^3 + B*b^3*g^3)*x^4 + 1/6*(B*b^
3*c*g^3 + 6*A*a*b^2*d*g^3 + 5*B*a*b^2*d*g^3)*x^3/d + 1/4*(B*b^3*g^3*x^4 + 4
*B*a*b^2*g^3*x^3 + 6*B*a^2*b*g^3*x^2 + 4*B*a^3*g^3*x)*log((d^2*x^2 + 2*c*d*
```

```
x + c^2)/(b^2*x^2 + 2*a*b*x + a^2)) - 1/4*(B*b^3*c^2*g^3 - 4*B*a*b^2*c*d*g^
3 - 6*A*a^2*b*d^2*g^3 - 3*B*a^2*b*d^2*g^3)*x^2/d^2 + 1/2*(B*b^3*c^3*g^3 - 4
*B*a*b^2*c^2*d*g^3 + 6*B*a^2*b*c*d^2*g^3 + 2*A*a^3*d^3*g^3 - B*a^3*d^3*g^3)
*x/d^3 - 1/2*(B*b^3*c^4*g^3 - 4*B*a*b^2*c^3*d*g^3 + 6*B*a^2*b*c^2*d^2*g^3 -
 4*B*a^3*c*d^3*g^3)*log(-d*x - c)/d^4
```

maple [B] time = 0.07, size = 788, normalized size = 5.22

$$\frac{B\,b^{3}g^{3}x^{4}\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^{2}e}{b^{2}}\right)}{4}+\frac{A\,b^{3}g^{3}x^{4}}{4}+Ba\,b^{2}g^{3}x^{3}\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^{2}e}{b^{2}}\right)+Aa\,b^{2}g^{3}x^{3}+\frac{3B\,a^{2}b\,g^{3}x^{2}\ln\left(\left(\frac{ad}{bx+a}\right.\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] -3/2*B*x*a^3*g^3+1/4/b*A*a^4*g^3-11/12/b*B*a^4*g^3+1/4*b^3*A*x^4*g^3+A*x*a^
3*g^3+B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*x*a^3*g^3-1/6*b^2*B*x^3
*a*g^3-3/4*b*B*x^2*a^2*g^3+3/2*b*A*x^2*a^2*g^3+1/4*b^3*B*ln((1/(b*x+a)*a*d-
1/(b*x+a)*b*c-d)^2/b^2*e)*x^4*g^3-1/2/b*g^3*B*a^4*ln(1/(b*x+a)*a*d-1/(b*x+a
)*b*c-d)+1/4/b*B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*a^4*g^3+1/2/b*
g^3*B*a^4*ln(1/(b*x+a))+b^2*A*x^3*a*g^3+3/2*b*B*ln((1/(b*x+a)*a*d-1/(b*x+a)
*b*c-d)^2/b^2*e)*x^2*a^2*g^3+13/6*g^3*B*c/d*a^3-7/4*b*g^3*B*c^2/d^2*a^2+1/2
*b^2*g^3*B*c^3/d^3*a+1/6*b^3*g^3*B*c/d*x^3-1/4*b^3*g^3*B*c^2/d^2*x^2+1/2*b^
3*g^3*B*c^3/d^3*x-1/2*b^3*g^3*B*c^4/d^4*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)+1
/2*b^3*g^3*B*c^4/d^4*ln(1/(b*x+a))+b^2*B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)
^2/b^2*e)*x^3*a*g^3+2*g^3*B*a^3/d*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c-2*g^3
*B*a^3/d*ln(1/(b*x+a))*c-2*b^2*g^3*B*a/d^3*ln(1/(b*x+a))*c^3+3*b*g^3*B*a^2/
d^2*ln(1/(b*x+a))*c^2-3*b*g^3*B*a^2/d^2*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c
^2+2*b^2*g^3*B*a/d^3*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c^3+b^2*g^3*B*c/d*x^
2*a+3*b*g^3*B*c/d*x*a^2-2*b^2*g^3*B*c^2/d^2*x*a
```

maxima [B] time = 1.31, size = 645, normalized size = 4.27

$$\frac{1}{4}\,Ab^{3}g^{3}x^{4}+Aab^{2}g^{3}x^{3}+\frac{3}{2}\,Aa^{2}bg^{3}x^{2}+\left(x\log\left(\frac{d^{2}ex^{2}}{b^{2}x^{2}+2\,abx+a^{2}}+\frac{2\,cdex}{b^{2}x^{2}+2\,abx+a^{2}}+\frac{c^{2}e}{b^{2}x^{2}+2\,abx+a^{2}}\right)-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(d^2*e*x^
2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(
b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d)*B*a^3*
g^3 + 3/2*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2
 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*x + a)/b
^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + (x^3*log
(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2)
+ c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x
 + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*
B*a*b^2*g^3 + 1/12*(3*x^4*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e
*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 6*a^4*log
(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^
3 + A*a^3*g^3*x
```

mupad [**B**] time = 4.85, size = 567, normalized size = 3.75

$$\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)\left(B\,a^3\,g^3\,x+\frac{3\,B\,a^2\,b\,g^3\,x^2}{2}+B\,a\,b^2\,g^3\,x^3+\frac{B\,b^3\,g^3\,x^4}{4}\right)-x^2\left(\frac{\left(\frac{b^2\,g^3\,(8\,A\,a\,d+2\,A\,b\,c-B\,a\,d+B\,b\,c)}{2\,d}-\frac{A\,b^2\,g^3\,(2}{2}\right.}{4\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)),x)
```

```
[Out] log((e*(c + d*x)^2)/(a + b*x)^2)*((B*b^3*g^3*x^4)/4 + B*a^3*g^3*x + (3*B*a^
2*b*g^3*x^2)/2 + B*a*b^2*g^3*x^3) - x^2*((((b^2*g^3*(8*A*a*d + 2*A*b*c - B*
a*d + B*b*c))/(2*d) - (A*b^2*g^3*(2*a*d + 2*b*c))/(2*d))*(2*a*d + 2*b*c))/(
4*b*d) - (a*b*g^3*(3*A*a*d + 2*A*b*c - B*a*d + B*b*c))/d + (A*a*b^2*c*g^3)/
(2*d)) + x*(((2*a*d + 2*b*c)*((((b^2*g^3*(8*A*a*d + 2*A*b*c - B*a*d + B*b*c
))/(2*d) - (A*b^2*g^3*(2*a*d + 2*b*c))/(2*d))*(2*a*d + 2*b*c))/(2*b*d) - (2
*a*b*g^3*(3*A*a*d + 2*A*b*c - B*a*d + B*b*c))/d + (A*a*b^2*c*g^3)/d))/(2*b*
d) + (a^2*g^3*(4*A*a*d + 6*A*b*c - 3*B*a*d + 3*B*b*c))/d - (a*c*((b^2*g^3*(
8*A*a*d + 2*A*b*c - B*a*d + B*b*c))/(2*d) - (A*b^2*g^3*(2*a*d + 2*b*c))/(2*
d)))/(b*d)) + x^3*((b^2*g^3*(8*A*a*d + 2*A*b*c - B*a*d + B*b*c))/(6*d) - (A
*b^2*g^3*(2*a*d + 2*b*c))/(6*d)) - (log(c + d*x)*(B*b^3*c^4*g^3 - 4*B*a^3*c
*d^3*g^3 + 6*B*a^2*b*c^2*d^2*g^3 - 4*B*a*b^2*c^3*d*g^3))/(2*d^4) + (A*b^3*g
^3*x^4)/4 - (B*a^4*g^3*log(a + b*x))/(2*b)
```

sympy [**B**] time = 4.35, size = 707, normalized size = 4.68

$$\frac{Ab^3g^3x^4}{4}-\frac{Ba^4g^3\log\left(x+\frac{\frac{Ba^5d^4g^3}{b}+4Ba^4cd^3g^3-6Ba^3bc^2d^2g^3+4Ba^2b^2c^3dg^3-Bab^3c^4g^3}{Ba^4d^4g^3+4Ba^3bcd^3g^3-6Ba^2b^2c^2d^2g^3+4Bab^3c^3dg^3-Bb^4c^4g^3}\right)}{2b}+\frac{Bcg^3\,(2ad-bc)\left(2a^2d^2-2abcd+b^2c^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b**3*g**3*x**4/4 - B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*b) + B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*d**4) + x**3*(A*a*b**2*g**3 - B*a
*b**2*g**3/6 + B*b**3*c*g**3/(6*d)) + x**2*(3*A*a**2*b*g**3/2 - 3*B*a**2*b*
g**3/4 + B*a*b**2*c*g**3/d - B*b**3*c**2*g**3/(4*d**2)) + x*(A*a**3*g**3 -
3*B*a**3*g**3/2 + 3*B*a**2*b*c*g**3/d - 2*B*a*b**2*c**2*g**3/d**2 + B*b**3*
c**3*g**3/(2*d**3)) + (B*a**3*g**3*x + 3*B*a**2*b*g**3*x**2/2 + B*a*b**2*g*
*3*x**3 + B*b**3*g**3*x**4/4)*log(e*(c + d*x)**2/(a + b*x)**2)
```

3.203 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\,dx$

Optimal. Leaf size=120

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3b}+\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{2Bg^2x(bc-ad)^2}{3d^2}+\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

```
[Out] -2/3*B*(-a*d+b*c)^2*g^2*x/d^2+1/3*B*(-a*d+b*c)*g^2*(b*x+a)^2/b/d+2/3*B*(-a*
d+b*c)^3*g^2*ln(d*x+c)/b/d^3+1/3*g^2*(b*x+a)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^
2))/b
```

Rubi [A] time = 0.08, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = $\{2525, 12, 43\}$

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3b}-\frac{2Bg^2x(bc-ad)^2}{3d^2}+\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (-2*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2)/(3*b*d
) + (2*B*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3) + (g^2*(a + b*x)^3*(A +
B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b} - \frac{B\int\frac{2(-bc+ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b} + \frac{\left(2B(bc-ad)g^2\right)\int\frac{(a+bx)^2}{c+dx}\,dx}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b} + \frac{\left(2B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{d^2}+\right.}{3b}$$

$$= -\frac{2B(bc-ad)^2g^2x}{3d^2} + \frac{B(bc-ad)g^2(a+bx)^2}{3bd} + \frac{2B(bc-ad)^3g^2\log(c}{3bd^3}$$

Mathematica [A] time = 0.05, size = 98, normalized size = 0.82

$$\frac{g^2\left(\frac{B(bc-ad)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{d^3}+(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g^2*((B*(b*c - a*d)*(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c -
 a*d)^2*Log[c + d*x]))/d^3 + (a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*
x)^2])))/(3*b)
```

fricas [B] time = 0.60, size = 245, normalized size = 2.04

$$\frac{Ab^3d^3g^2x^3 - 2\,Ba^3d^3g^2\log(bx+a) + \left(Bb^3cd^2+(3\,A-B)ab^2d^3\right)g^2x^2 - \left(2\,Bb^3c^2d - 6\,Bab^2cd^2 - (3\,A-4\,B)a^2bd\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] 1/3*(A*b^3*d^3*g^2*x^3 - 2*B*a^3*d^3*g^2*log(b*x + a) + (B*b^3*c*d^2 + (3*A
 - B)*a*b^2*d^3)*g^2*x^2 - (2*B*b^3*c^2*d - 6*B*a*b^2*c*d^2 - (3*A - 4*B)*a
^2*b*d^3)*g^2*x + 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*log
(d*x + c) + (B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*g^2*
x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/(b*d^3)
```

giac [B] time = 3.51, size = 248, normalized size = 2.07

$$-\frac{2\,Ba^3g^2\log(bx+a)}{3\,b}+\frac{1}{3}\left(Ab^2g^2+Bb^2g^2\right)x^3+\frac{\left(Bb^2cg^2+3\,Aabdg^2+2\,Babdg^2\right)x^2}{3\,d}+\frac{1}{3}\left(Bb^2g^2x^3+3\,Babg^2x^2+3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] -2/3*B*a^3*g^2*log(b*x + a)/b + 1/3*(A*b^2*g^2 + B*b^2*g^2)*x^3 + 1/3*(B*b^
2*c*g^2 + 3*A*a*b*d*g^2 + 2*B*a*b*d*g^2)*x^2/d + 1/3*(B*b^2*g^2*x^3 + 3*B*a
*b*g^2*x^2 + 3*B*a^2*g^2*x)*log((d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*
x + a^2)) - 1/3*(2*B*b^2*c^2*g^2 - 6*B*a*b*c*d*g^2 - 3*A*a^2*d^2*g^2 + B*a^
```

```
2*d^2*g^2)*x/d^2 + 2/3*(B*b^2*c^3*g^2 - 3*B*a*b*c^2*d*g^2 + 3*B*a^2*c*d^2*g
^2)*log(d*x + c)/d^3
```

maple [B] time = 0.07, size = 569, normalized size = 4.74

$$\frac{B\,b^2g^2x^3\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2 e}{b^2}\right)}{3}+\frac{A\,b^2g^2x^3}{3}+Bab\,g^2x^2\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2 e}{b^2}\right)+Aab\,g^2x^2+B\,a^2g^2x\ln\Bigg(\Big(\frac{ad}{bx+a}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] 5/3*B*a^2*c/d*g^2+2/3/b*g^2*B*a^3*ln(1/(b*x+a))+1/3*A*b^2*g^2*x^3-2/3*B*a*b
*c^2/d^2*g^2-2/3*b^2*g^2*B*c^3/d^3*ln(1/(b*x+a))+2*B*a*b*c/d*g^2*x+2*b*g^2*
B*a/d^2*ln(1/(b*x+a))*c^2-2*g^2*B*a^2/d*ln(1/(b*x+a))*c+1/3*b^2*B*ln((1/(b*
x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*x^3*g^2+b*B*ln((1/(b*x+a)*a*d-1/(b*x+a)*
b*c-d)^2/b^2*e)*x^2*a*g^2+B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*x*a
^2*g^2+1/3/b*B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*a^3*g^2-2/3/b*g^
2*B*a^3*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)+2/3*b^2*g^2*B*c^3/d^3*ln(1/(b*x+a
)*a*d-1/(b*x+a)*b*c-d)-1/3*B*a*b*g^2*x^2+A*a*b*g^2*x^2+A*a^2*g^2*x-4/3*B*a^
2*g^2*x+1/3/b*A*a^3*g^2-1/b*g^2*B*a^3-2/3*B*b^2*c^2/d^2*g^2*x+1/3*B*b^2*c/d
*g^2*x^2+2*g^2*B*a^2/d*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c-2*b*g^2*B*a/d^2*
ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c^2
```

maxima [B] time = 1.51, size = 436, normalized size = 3.63

$$\frac{1}{3}\,Ab^2g^2x^3+Aabg^2x^2+\Bigg(x\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx+a^2}\right)-\frac{2\,a\log\left(bx+a\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a
^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)
) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(d^2*e*x^2
/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b
^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2
+ 2*(b*c - a*d)*x/(b*d))*B*a*b*g^2 + 1/3*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*
b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x
 + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

mupad [B] time = 4.65, size = 296, normalized size = 2.47

$$x^2\,\left(\frac{b\,g^2\,\left(9\,A\,a\,d+3\,A\,b\,c-2\,B\,a\,d+2\,B\,b\,c\right)}{6\,d}-\frac{A\,b\,g^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,d}\right)-x\,\Bigg(\frac{\left(3\,a\,d+3\,b\,c\right)\,\Big(\frac{b\,g^2\,(9\,A\,a\,d+3\,A\,b\,c-2\,B\,a}{3\,d}}{3\,b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)),x)
```

```
[Out] x^2*((b*g^2*(9*A*a*d + 3*A*b*c - 2*B*a*d + 2*B*b*c))/(6*d) - (A*b*g^2*(3*a*
d + 3*b*c))/(6*d)) - x*(((3*a*d + 3*b*c)*((b*g^2*(9*A*a*d + 3*A*b*c - 2*B*a
*d + 2*B*b*c))/(3*d) - (A*b*g^2*(3*a*d + 3*b*c))/(3*d)))/(3*b*d) - (a*g^2*(
3*A*a*d + 3*A*b*c - 2*B*a*d + 2*B*b*c))/d + (A*a*b*c*g^2)/d) + log((e*(c +
```

```
d*x)^2)/(a + b*x)^2)*((B*b^2*g^2*x^3)/3 + B*a^2*g^2*x + B*a*b*g^2*x^2) + (l
og(c + d*x)*(2*B*b^2*c^3*g^2 + 6*B*a^2*c*d^2*g^2 - 6*B*a*b*c^2*d*g^2))/(3*d
^3) + (A*b^2*g^2*x^3)/3 - (2*B*a^3*g^2*log(a + b*x))/(3*b)
```

sympy [B] time = 3.13, size = 517, normalized size = 4.31

$$\frac{Ab^2g^2x^3}{3} - \frac{2Ba^3g^2\log\left(x + \frac{\frac{2Ba^4d^3g^2}{b}+6Ba^3cd^2g^2-6Ba^2bc^2dg^2+2Bab^2c^3g^2}{2Ba^3d^3g^2+6Ba^2bcd^2g^2-6Bab^2c^2dg^2+2Bb^3c^3g^2}\right)}{3b} + \frac{2Bcg^2\left(3a^2d^2-3abcd+b^2c^2\right)\log\left(x+\frac{8Ba^3cd^2g}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b**2*g**2*x**3/3 - 2*B*a**3*g**2*log(x + (2*B*a**4*d**3*g**2/b + 6*B*a**3
*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2)/(2*B*a**3*d**
3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g*
*2))/(3*b) + 2*B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (8*B*
a**3*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2 - 2*B*a*c*
g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2) + 2*B*b*c**2*g**2*(3*a**2*d**2 -
 3*a*b*c*d + b**2*c**2)/d)/(2*B*a**3*d**3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6
*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g**2))/(3*d**3) + x**2*(A*a*b*g**2 -
B*a*b*g**2/3 + B*b**2*c*g**2/(3*d)) + x*(A*a**2*g**2 - 4*B*a**2*g**2/3 + 2*
B*a*b*c*g**2/d - 2*B*b**2*c**2*g**2/(3*d**2)) + (B*a**2*g**2*x + B*a*b*g**2
*x**2 + B*b**2*g**2*x**3/3)*log(e*(c + d*x)**2/(a + b*x)**2)
```

3.204 $\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\,dx$

Optimal. Leaf size=78

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}+\frac{Bgx(bc-ad)}{d}$$

```
[Out] B*(-a*d+b*c)*g*x/d-B*(-a*d+b*c)^2*g*ln(d*x+c)/b/d^2+1/2*g*(b*x+a)^2*(A+B*ln
(e*(d*x+c)^2/(b*x+a)^2))/b
```

Rubi [A] time = 0.05, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}+\frac{Bgx(bc-ad)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (B*(b*c - a*d)*g*x)/d - (B*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) + (g*(a +
b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(2*b)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)dx &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b}-\frac{B\int\frac{2(bc-ad)g^2(-a-bx)}{c+dx}dx}{2bg}\\ &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b}-\frac{(B(bc-ad)g)\int\frac{-a-bx}{c+dx}dx}{b}\\ &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b}-\frac{(B(bc-ad)g)\int\left(-\frac{b}{d}+\frac{bc-ad}{d(c+dx)}\right)}{b}\\ &= \frac{B(bc-ad)gx}{d}-\frac{B(bc-ad)^2g\log(c+dx)}{bd^2}+\frac{g(a+bx)^2\left(A+B\log\left(\right.\right.}{2b}\end{aligned}$$

Mathematica [**A**] time = 0.04, size = 72, normalized size = 0.92

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-\frac{2B(ad-bc)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g*((-2*B*(-(b*c) + a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2 + (a +
b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])))/(2*b)
```

fricas [**A**] time = 0.64, size = 149, normalized size = 1.91

$$\frac{Ab^2d^2gx^2-2\,Ba^2d^2g\log\left(bx+a\right)+2\left(Bb^2cd+(A-B)abd^2\right)gx-2\left(Bb^2c^2-2\,Babcd\right)g\log\left(dx+c\right)+\left(Bb^2d^2gx^2\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fricas
")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 - 2*B*a^2*d^2*g*log(b*x + a) + 2*(B*b^2*c*d + (A - B)*
a*b*d^2)*g*x - 2*(B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^
2 + 2*B*a*b*d^2*g*x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x
 + a^2)))/(b*d^2)
```

giac [**A**] time = 0.90, size = 128, normalized size = 1.64

$$-\frac{Ba^2g\log\left(bx+a\right)}{b}+\frac{1}{2}\left(Abg+Bbg\right)x^2+\frac{1}{2}\left(Bbgx^2+2\,Bagx\right)\log\left(\frac{d^2x^2+2\,cdx+c^2}{b^2x^2+2\,abx+a^2}\right)+\frac{\left(Bbcg+Aadg\right)x}{d}-\left(Bbc^2g\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac")
```

```
[Out] -B*a^2*g*log(b*x + a)/b + 1/2*(A*b*g + B*b*g)*x^2 + 1/2*(B*b*g*x^2 + 2*B*a*
g*x)*log((d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*x + a^2)) + (B*b*c*g +
A*a*d*g)*x/d - (B*b*c^2*g - 2*B*a*c*d*g)*log(-d*x - c)/d^2
```

maple [**B**] time = 0.06, size = 340, normalized size = 4.36

$$\frac{Bbg\,x^2\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2e}{b^2}\right)}{2}+\frac{Abg\,x^2}{2}+Bagx\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2e}{b^2}\right)+Aagx+\frac{B\,a^2g\ln\left(\frac{1}{bx+a}\right)}{b}+\frac{B\,a^2g\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}\right.}{b^2}\right.}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] 1/2*b*A*x^2*g+A*x*a*g+1/2/b*A*a^2*g+1/2*b*B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c
-d)^2/b^2*e)*x^2*g+B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*x*a*g+1/2/
b*B*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)*a^2*g-1/b*g*B*ln(1/(b*x+a)*
a*d-1/(b*x+a)*b*c-d)*a^2+2*g*B/d*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*a*c-b*g*
B/d^2*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c^2+1/b*g*B*ln(1/(b*x+a))*a^2-2*g*B
/d*ln(1/(b*x+a))*a*c+b*g*B/d^2*ln(1/(b*x+a))*c^2-B*x*a*g-1/b*g*B*a^2+b*g*B/
d*c*x+g*B/d*a*c
```

maxima [B] time = 1.44, size = 250, normalized size = 3.21

$$\frac{1}{2}\,Abgx^2+\left(x\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx+a^2}\right)-\frac{2\,a\log\left(bx+a\right)}{b}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxima
")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2
*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)
/b + 2*c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x
+ a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a
^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b
*d))*B*b*g + A*a*g*x
```

mupad [B] time = 4.38, size = 120, normalized size = 1.54

$$x\,\left(\frac{g\,\left(2\,A\,a\,d+A\,b\,c-B\,a\,d+B\,b\,c\right)}{d}-\frac{A\,g\,\left(a\,d+b\,c\right)}{d}\right)+\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\,\left(\frac{B\,b\,g\,x^2}{2}+B\,a\,g\,x\right)+\frac{A\,b\,g\,x^2}{2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)),x)
```

```
[Out] x*((g*(2*A*a*d + A*b*c - B*a*d + B*b*c))/d - (A*g*(a*d + b*c))/d) + log((e*
(c + d*x)^2)/(a + b*x)^2)*((B*b*g*x^2)/2 + B*a*g*x) + (A*b*g*x^2)/2 - (B*a^
2*g*log(a + b*x))/b + (B*c*g*log(c + d*x)*(2*a*d - b*c))/d^2
```

sympy [B] time = 1.92, size = 250, normalized size = 3.21

$$\frac{Abgx^2}{2}-\frac{Ba^2g\log\left(x+\frac{\frac{Ba^3d^2g}{b}+2Ba^2cdg-Babc^2g}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{b}+\frac{Bcg\left(2ad-bc\right)\log\left(x+\frac{3Ba^2cdg-Babc^2g-Bacg(2ad-bc)+\frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{d^2}+x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b*g*x**2/2 - B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/b + B*c*g*(2*a*d -
b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B*b*c
**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/d**
2 + x*(A*a*g - B*a*g + B*b*c*g/d) + (B*a*g*x + B*b*g*x**2/2)*log(e*(c + d*x
)**2/(a + b*x)**2)
```

3.205 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=83

$$-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg}-\frac{2B\mathrm{Li}_2\left(\frac{bc-ad}{d(a+bx)}+1\right)}{bg}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/g-2*B*polylog(2,
1+(-a*d+b*c)/d/(b*x+a))/b/g
```

Rubi [A] time = 0.29, antiderivative size = 121, normalized size of antiderivative = 1.46, number of steps used = 10, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg}-\frac{2B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}+\frac{B\log^2(g(a+}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x),x]
```

```
[Out] (B*Log[g*(a + b*x)]^2)/(b*g) - (2*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g
+ b*g*x])/(b*g) + ((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])*Log[a*g + b*g*x
])/(b*g) - (2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{ag+bgx}\,dx &= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int\frac{(a+bx)^2\left(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\right)\log(ag+bgx)}{e(c+dx)^2}\,dx}{bg}\\
&= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int\frac{(a+bx)^2\left(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\right)\log(ag+bgx)}{(c+dx)^2}\,dx}{beg}\\
&= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg}-\frac{B\int\left(-\frac{2be\log(ag+bgx)}{a+bx}+\frac{2de\log(ag+bgx)}{c+dx}\right)dx}{beg}\\
&= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg}+\frac{(2B)\int\frac{\log(ag+bgx)}{a+bx}\,dx}{g}-\frac{(2Bd)\int\frac{\log(ag+bgx)}{c+dx}}{bg}\\
&= -\frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}+\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg}+(2B)\int\\
&= -\frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}+\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg}+\frac{(2B)\,\mathrm{S}}{}\\
&= \frac{B\log^2(g(a+bx))}{bg}-\frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}+\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(}{bg}
\end{aligned}
$$

Mathematica [A] time = 0.04, size = 87, normalized size = 1.05

$$
\frac{\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)-2B\log\left(\frac{b(c+dx)}{bc-ad}\right)+B\log(a+bx)+A\right)-2B\,\mathrm{Li}_2\left(\frac{d(a+bx)}{ad-bc}\right)}{bg}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x),x]
```

```
[Out] (Log[a + b*x]*(A + B*Log[a + b*x] - 2*B*Log[(b*(c + d*x))/(b*c - a*d)] + B*
Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 2*B*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)])/(b*g)
```

fricas [F] time = 2.56, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{B\log\left(\frac{d^{2}ex^{2}+2\,cdex+c^{2}e}{b^{2}x^{2}+2\,abx+a^{2}}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x, algorithm="fricas
")
```

```
[Out] integral((B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))
+ A)/(b*g*x + a*g), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)/(b*g*x + a*g), x)
```

maple [B] time = 0.06, size = 265, normalized size = 3.19

$$\frac{2Bad\ln\left(\frac{1}{bx+a}\right)\ln\left(-\frac{-d+\frac{ad-bc}{bx+a}}{d}\right)}{(ad-bc)\,bg}-\frac{2Bc\ln\left(\frac{1}{bx+a}\right)\ln\left(-\frac{-d+\frac{ad-bc}{bx+a}}{d}\right)}{(ad-bc)\,g}+\frac{2Bad\operatorname{dilog}\left(-\frac{-d+\frac{ad-bc}{bx+a}}{d}\right)}{(ad-bc)\,bg}-\frac{2Bc\operatorname{dilog}\left(-\frac{-d+\frac{ad-bc}{bx+a}}{d}\right)}{(ad-bc)\,g}-\frac{B}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x)
```

```
[Out] -1/b/g*A*ln(1/(b*x+a))-1/b/g*B*ln(1/(b*x+a))*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*
c-d)^2/b^2*e)+2/b/g*B*dilog(-(1/(b*x+a)*(a*d-b*c)-d)/d)/(a*d-b*c)*a*d-2/g*B
*dilog(-(1/(b*x+a)*(a*d-b*c)-d)/d)/(a*d-b*c)*c+2/b/g*B*ln(1/(b*x+a))*ln(-(1
/(b*x+a)*(a*d-b*c)-d)/d)/(a*d-b*c)*a*d-2/g*B*ln(1/(b*x+a))*ln(-(1/(b*x+a)*(
a*d-b*c)-d)/d)/(a*d-b*c)*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$B\left(\frac{2\,\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int-\frac{bdx\log(e)+bc\log(e)-2\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^{2}dgx^{2}+abcg+\left(b^{2}cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+a\right.}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x, algorithm="maxima
")
```

```
[Out] B*(2*log(b*x + a)*log(d*x + c)/(b*g) - integrate(-(b*d*x*log(e) + b*c*log(e
) - 2*(2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g
 + a*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))/(a*g + b*g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A}{a+bx}\, dx + \int \frac{B\log\left(\frac{c^2e}{a^2+2abx+b^2x^2}+\frac{2cdex}{a^2+2abx+b^2x^2}+\frac{d^2ex^2}{a^2+2abx+b^2x^2}\right)}{a+bx}\, dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g),x)
```

```
[Out] (Integral(A/(a + b*x), x) + Integral(B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x*
*2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x
+ b**2*x**2))/(a + b*x), x))/g
```

3.206 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=102

$$-\frac{A(c+dx)}{g^2(a+bx)(bc-ad)}-\frac{B(c+dx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{g^2(a+bx)(bc-ad)}+\frac{2B(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] -A*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)+2*B*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)-B*(d*x
+c)*ln(e*(d*x+c)^2/(b*x+a)^2)/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [A] time = 0.08, antiderivative size = 105, normalized size of antiderivative = 1.03, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{bg^2(a+bx)}+\frac{2Bd\log(a+bx)}{bg^2(bc-ad)}-\frac{2Bd\log(c+dx)}{bg^2(bc-ad)}+\frac{2B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] (2*B)/(b*g^2*(a + b*x)) + (2*B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (2*B*d
*Log[c + d*x])/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
])/(b*g^2*(a + b*x))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)} + \frac{B\int\frac{2(-bc+ad)}{g(a+bx)^2(c+dx)}\,dx}{bg} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)} - \frac{(2B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)} - \frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2} - \frac{bd}{(bc-ad)^2(a+bx)} + \frac{d^2}{(bc-ad)^2(c+d}\right.}{bg^2} \\
&= \frac{2B}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)}{b(bc-ad)g^2} - \frac{2Bd\log(c+dx)}{b(bc-ad)g^2} - \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)}
\end{aligned}
$$

Mathematica [**A**]   time = 0.05, size = 89, normalized size = 0.87

$$
\frac{-(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A-2B\right)-2Bd(a+bx)\log(c+dx)+2Bd(a+bx)\log(a+bx)}{bg^2(a+bx)(bc-ad)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] (2*B*d*(a + b*x)*Log[a + b*x] - 2*B*d*(a + b*x)*Log[c + d*x] - (b*c - a*d)*
(A - 2*B + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^2*(a + b*x
))
```

fricas [**A**]   time = 0.49, size = 110, normalized size = 1.08

$$
-\frac{(A-2\,B)bc-(A-2\,B)ad+(Bbdx+Bbc)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x, algorithm="fric
as")
```

```
[Out] -((A - 2*B)*b*c - (A - 2*B)*a*d + (B*b*d*x + B*b*c)*log((d^2*e*x^2 + 2*c*d*
e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*
c - a^2*b*d)*g^2)
```

giac [**A**]   time = 0.40, size = 188, normalized size = 1.84

$$
-\left(2\left(b^2cg^2-abdg^2\right)\left(\frac{d\log\left(\left|\frac{bcg}{bgx+ag}-\frac{adg}{bgx+ag}+d\right|\right)}{b^4c^2g^4-2\,ab^3cdg^4+a^2b^2d^2g^4}-\frac{1}{\left(b^2cg^2-abdg^2\right)\left(bgx+ag\right)bg}\right)+\frac{\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)}{\left(bgx+ag\right)bg}\right)B-\frac{}{(bg}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x, algorithm="giac
")
```

```
[Out] -(2*(b^2*c*g^2 - a*b*d*g^2)*(d*log(abs(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x +
 a*g) + d))/(b^4*c^2*g^4 - 2*a*b^3*c*d*g^4 + a^2*b^2*d^2*g^4) - 1/((b^2*c*g
^2 - a*b*d*g^2)*(b*g*x + a*g)*b*g)) + log((d*x + c)^2*e/(b*x + a)^2)/((b*g*
x + a*g)*b*g))*B - A/((b*g*x + a*g)*b*g)
```

maple [B] time = 0.05, size = 212, normalized size = 2.08

$$\frac{2Ba\,d^{2}\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{(ad-bc)^{2}\,b\,g^{2}}-\frac{2Bcd\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{(ad-bc)^{2}\,g^{2}}+\frac{2Bad}{(ad-bc)\,(bx+a)\,b\,g^{2}}-\frac{2Bc}{(ad-bc)\,(bx+a)\,g^{2}}-\frac{B\ln\left(\left(\frac{ad}{bx+a}\right.\right.}{(bx+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x)
```

```
[Out] -1/b/g^2*A/(b*x+a)-1/b/g^2*B/(b*x+a)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b
^2*e)+2/b/g^2*B/(a*d-b*c)/(b*x+a)*a*d-2/g^2*B/(a*d-b*c)/(b*x+a)*c+2/b/g^2*B
*d^2/(a*d-b*c)^2*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*a-2/g^2*B*d/(a*d-b*c)^2*
ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c
```

maxima [A] time = 1.08, size = 187, normalized size = 1.83

$$-B\left(\frac{\log\left(\frac{d^{2}ex^{2}}{b^{2}x^{2}+2\,abx+a^{2}}+\frac{2\,cdex}{b^{2}x^{2}+2\,abx+a^{2}}+\frac{c^{2}e}{b^{2}x^{2}+2\,abx+a^{2}}\right)}{b^{2}g^{2}x+abg^{2}}-\frac{2}{b^{2}g^{2}x+abg^{2}}-\frac{2\,d\log\left(bx+a\right)}{\left(b^{2}c-abd\right)g^{2}}+\frac{2\,d\log\left(dx+c\right)}{\left(b^{2}c-abd\right)g^{2}}\right)-\frac{}{b^{2}g^{2}x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x, algorithm="maxi
ma")
```

```
[Out] -B*(log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x
+ a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^2*g^2*x + a*b*g^2) - 2/(b^2*g^
2*x + a*b*g^2) - 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + 2*d*log(d*x + c)/
((b^2*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

mupad [B] time = 5.94, size = 108, normalized size = 1.06

$$-\frac{A-2\,B}{x\,b^{2}\,g^{2}+a\,b\,g^{2}}-\frac{B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^{2}}{{\left(a+b\,x\right)}^{2}}\right)}{b^{2}\,g^{2}\,\left(x+\frac{a}{b}\right)}+\frac{B\,d\,\mathrm{atan}\left(\frac{b\,c\,2{}\mathrm{i}+b\,d\,x\,2{}\mathrm{i}}{a\,d-b\,c}+1{}\mathrm{i}\right)\,4{}\mathrm{i}}{b\,g^{2}\,\left(a\,d-b\,c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))/(a*g + b*g*x)^2,x)
```

```
[Out] (B*d*atan((b*c*2i + b*d*x*2i)/(a*d - b*c) + 1i)*4i)/(b*g^2*(a*d - b*c)) - (
B*log((e*(c + d*x)^2)/(a + b*x)^2))/(b^2*g^2*(x + a/b)) - (A - 2*B)/(b^2*g^
2*x + a*b*g^2)
```

sympy [B] time = 1.64, size = 253, normalized size = 2.48

$$-\frac{B\log\left(\frac{e(c+dx)^{2}}{(a+bx)^{2}}\right)}{abg^{2}+b^{2}g^{2}x}+\frac{2Bd\log\left(x+\frac{-\frac{2Ba^{2}d^{3}}{ad-bc}+\frac{4Babcd^{2}}{ad-bc}+2Bad^{2}-\frac{2Bb^{2}c^{2}d}{ad-bc}+2Bbcd}{4Bbd^{2}}\right)}{bg^{2}\left(ad-bc\right)}-\frac{2Bd\log\left(x+\frac{\frac{2Ba^{2}d^{3}}{ad-bc}-\frac{4Babcd^{2}}{ad-bc}+2Bad^{2}+\frac{2Bb^{2}c^{2}d}{ad-bc}+2Bbcd}{4Bbd^{2}}\right)}{bg^{2}\left(ad-bc\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(a*b*g**2 + b**2*g**2*x) + 2*B*d*log(x
+ (-2*B*a**2*d**3/(a*d - b*c) + 4*B*a*b*c*d**2/(a*d - b*c) + 2*B*a*d**2 - 2
*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*(a*d - b*c))
- 2*B*d*log(x + (2*B*a**2*d**3/(a*d - b*c) - 4*B*a*b*c*d**2/(a*d - b*c) + 2
*B*a*d**2 + 2*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*
(a*d - b*c)) + (-A + 2*B)/(a*b*g**2 + b**2*g**2*x)
```

3.207 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=139

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}-\frac{Bd}{bg^3(a+bx)(bc-ad)}+\frac{B}{2bg^3(a+bx)^2}$$

```
[Out] 1/2*B/b/g^3/(b*x+a)^2-B*d/b/(-a*d+b*c)/g^3/(b*x+a)-B*d^2*ln(b*x+a)/b/(-a*d+
b*c)^2/g^3+B*d^2*ln(d*x+c)/b/(-a*d+b*c)^2/g^3+1/2*(-A-B*ln(e*(d*x+c)^2/(b*x
+a)^2))/b/g^3/(b*x+a)^2
```

Rubi [A] time = 0.10, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}-\frac{Bd}{bg^3(a+bx)(bc-ad)}+\frac{B}{2bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] B/(2*b*g^3*(a + b*x)^2) - (B*d)/(b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Log[
a + b*x])/(b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3
) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*b*g^3*(a + b*x)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^3}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{2(-bc+ad)}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}-\right.}{bg^3}$$

$$= \frac{B}{2bg^3(a+bx)^2}-\frac{Bd}{b(bc-ad)g^3(a+bx)}-\frac{Bd^2\log(a+bx)}{b(bc-ad)^2g^3}+\frac{Bd^2\log(c+dx)}{b(bc-ad)^2g^3}-\frac{A+B}{2b}$$

Mathematica [**A**] time = 0.09, size = 128, normalized size = 0.92

$$-\frac{(bc-ad)\left(-aAd+B(bc-ad)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+3aBd+Abc-bBc+2bBdx\right)-2Bd^2(a+bx)^2\log(c+dx)+2Bd^2(}{2bg^3(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] -1/2*(2*B*d^2*(a + b*x)^2*Log[a + b*x] - 2*B*d^2*(a + b*x)^2*Log[c + d*x] +
 (b*c - a*d)*(A*b*c - b*B*c - a*A*d + 3*a*B*d + 2*b*B*d*x + B*(b*c - a*d)*L
og[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^2*g^3*(a + b*x)^2)
```

fricas [**A**] time = 0.65, size = 240, normalized size = 1.73

$$-\frac{(A-B)b^2c^2-2\,(A-2\,B)abcd+(A-3\,B)a^2d^2+2\left(Bb^2cd-Babd^2\right)x-\left(Bb^2d^2x^2+2\,Babd^2x-Bb^2c^2+2\,Babc\right.}{2\left(\left(b^5c^2-2\,ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2\,a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2\,a^3b^2cd+a^4b\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x, algorithm="fric
as")
```

```
[Out] -1/2*((A - B)*b^2*c^2 - 2*(A - 2*B)*a*b*c*d + (A - 3*B)*a^2*d^2 + 2*(B*b^2*
c*d - B*a*b*d^2)*x - (B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a*b*c
*d)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^5*c
^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^
3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

giac [**A**] time = 0.34, size = 259, normalized size = 1.86

$$-\frac{Bd^2\log(bx+a)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}+\frac{Bd^2\log(dx+c)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}-\frac{B\log\left(\frac{d^2x^2+2\,cdx+c^2}{b^2x^2+2\,abx+a^2}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}-\frac{}{2\left(b^4cg^3x^2-ab^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x, algorithm="giac
")
```

```
[Out] -B*d^2*log(b*x + a)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) + B*d^2
*log(d*x + c)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/2*B*log((
d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*x + a^2))/(b^3*g^3*x^2 + 2*a*b^2*
```

```
g^3*x + a^2*b*g^3) - 1/2*(2*B*b*d*x + A*b*c - A*a*d + 2*B*a*d)/(b^4*c*g^3*x
^2 - a*b^3*d*g^3*x^2 + 2*a*b^3*c*g^3*x - 2*a^2*b^2*d*g^3*x + a^2*b^2*c*g^3
- a^3*b*d*g^3)
```

maple [B] time = 0.06, size = 300, normalized size = 2.16

$$\frac{Ba\,d^3\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{(ad-bc)^3\,b\,g^3}-\frac{Bc\,d^2\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{(ad-bc)^3\,g^3}+\frac{B\,a^2d^2}{2\,(ad-bc)^2\,(bx+a)^2\,b\,g^3}-\frac{Bacd}{(ad-bc)^2\,(bx+a)^2\,g^3}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2/b/(b*x+a)^2/g^3*A-1/2/b/g^3*B/(b*x+a)^2*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*
c-d)^2/b^2*e)+1/2/b/g^3*B/(a*d-b*c)^2/(b*x+a)^2*a^2*d^2-1/g^3*B/(a*d-b*c)^2
/(b*x+a)^2*a*d*c+1/2*b/g^3*B/(a*d-b*c)^2/(b*x+a)^2*c^2+1/b/g^3*B/(a*d-b*c)^
2/(b*x+a)*d^2*a-1/g^3*B/(a*d-b*c)^2/(b*x+a)*d*c+1/b/g^3*B*d^3/(a*d-b*c)^3*l
n(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*a-1/g^3*B*d^2/(a*d-b*c)^3*ln(1/(b*x+a)*a*d
-1/(b*x+a)*b*c-d)*c
```

maxima [B] time = 1.16, size = 306, normalized size = 2.20

$$-\frac{1}{2}\,B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}+\frac{\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\right.}{b^3g^3x^2+2\,ab^2g^3x+a^2bg^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x, algorithm="maxi
ma")
```

```
[Out] -1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a
^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + log(d^2*e*x^2/(b^2*x^2 + 2*a
*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*
x + a^2))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((
b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*
a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g
^3)
```

mupad [B] time = 5.93, size = 206, normalized size = 1.48

$$\frac{2\,B\,d^2\,\mathrm{atanh}\left(\frac{b^3\,c^2\,g^3-a^2\,b\,d^2\,g^3}{b\,g^3\,(a\,d-b\,c)^2}-\frac{2\,b\,d\,x}{a\,d-b\,c}\right)}{b\,g^3\,(a\,d-b\,c)^2}-\frac{B\,\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)}{2\,b^2\,g^3\,\left(2\,a\,x+b\,x^2+\frac{a^2}{b}\right)}-\frac{\frac{A\,a\,d-A\,b\,c-3\,B\,a\,d+B\,b\,c}{2\,(a\,d-b\,c)}-\frac{B\,b\,d\,x}{a\,d-b\,c}}{a^2\,b\,g^3+2\,a\,b^2\,g^3\,x+b^3\,g^3\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))/(a*g + b*g*x)^3,x)
```

```
[Out] (2*B*d^2*atanh((b^3*c^2*g^3 - a^2*b*d^2*g^3)/(b*g^3*(a*d - b*c)^2) - (2*b*d
*x)/(a*d - b*c)))/(b*g^3*(a*d - b*c)^2) - (B*log((e*(c + d*x)^2)/(a + b*x)^
2))/(2*b^2*g^3*(2*a*x + b*x^2 + a^2/b)) - ((A*a*d - A*b*c - 3*B*a*d + B*b*c
)/(2*(a*d - b*c)) - (B*b*d*x)/(a*d - b*c))/(a^2*b*g^3 + b^3*g^3*x^2 + 2*a*b
^2*g^3*x)
```

sympy [B] time = 2.60, size = 418, normalized size = 3.01

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}+\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{bg^3\,(ad-bc)^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b*
*3*g**3*x**2) + B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*
d**4/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b*
*3*c**3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)
**2) - B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d
- b*c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d*
*2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)**2) + (-A
*a*d + A*b*c + 3*B*a*d - B*b*c + 2*B*b*d*x)/(2*a**3*b*d*g**3 - 2*a**2*b**2*
c*g**3 + x**2*(2*a*b**3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4
*a*b**3*c*g**3))
```

3.208 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=177

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{3bg^4(a+bx)^3}+\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}+$$

```
[Out] 2/9*B/b/g^4/(b*x+a)^3-1/3*B*d/b/(-a*d+b*c)/g^4/(b*x+a)^2+2/3*B*d^2/b/(-a*d+
b*c)^2/g^4/(b*x+a)+2/3*B*d^3*ln(b*x+a)/b/(-a*d+b*c)^3/g^4-2/3*B*d^3*ln(d*x+
c)/b/(-a*d+b*c)^3/g^4+1/3*(-A-B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/g^4/(b*x+a)^3
```

Rubi **[A]** time = 0.12, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{3bg^4(a+bx)^3}+\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] (2*B)/(9*b*g^4*(a + b*x)^3) - (B*d)/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (2*
B*d^2)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (2*B*d^3*Log[a + b*x])/(3*b*(b*c
 - a*d)^3*g^4) - (2*B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) - (A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2])/(3*b*g^4*(a + b*x)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^4}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bg^4(a+bx)^3}+\frac{B\int\frac{2(-bc+ad)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}\\ &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bg^4(a+bx)^3}-\frac{(2B(bc-ad))\int\frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}\\ &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bg^4(a+bx)^3}-\frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)}\right.}{3bg^4}\\ &= \frac{2B}{9bg^4(a+bx)^3}-\frac{Bd}{3b(bc-ad)g^4(a+bx)^2}+\frac{2Bd^2}{3b(bc-ad)^2g^4(a+bx)}+\frac{2Bd^3\log(a+b}{3b(bc-ad)^3g}\end{aligned}$$

Mathematica [A] time = 0.10, size = 140, normalized size = 0.79

$$\frac{\frac{B\left(-6d^3(a+bx)^3\log(c+dx)+6d^2(a+bx)^2(bc-ad)-3d(a+bx)(bc-ad)^2+2(bc-ad)^3+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}-3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{9bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] ((B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a +
 b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))
/(b*c - a*d)^3 - 3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(9*b*g^4*(a +
b*x)^3)
```

fricas [B] time = 0.80, size = 432, normalized size = 2.44

$$-\frac{(3A-2B)b^3c^3-9(A-B)ab^2c^2d+9(A-2B)a^2bcd^2-(3A-11B)a^3d^3-6\left(Bb^3cd^2-Bab^2d^3\right)x^2+3\left(Bb^3c^2d\right.}{9\left(\left(b^7c^3-3ab^6c^2d+3a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3a^2b^5c^2d+3a^3b^4cd^2-a^4b^3d^3\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/9*((3*A - 2*B)*b^3*c^3 - 9*(A - B)*a*b^2*c^2*d + 9*(A - 2*B)*a^2*b*c*d^2
 - (3*A - 11*B)*a^3*d^3 - 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 + 3*(B*b^3*c^2*
d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 3*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x
^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log((
d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^7*c^3 - 3*a*
b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b
^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*
b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3
*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [B] time = 0.33, size = 473, normalized size = 2.67

$$\frac{2Bd^3\log(bx+a)}{3\left(b^4c^3g^4-3ab^3c^2dg^4+3a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{2Bd^3\log(dx+c)}{3\left(b^4c^3g^4-3ab^3c^2dg^4+3a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{B}{3\left(b^4g^4x^3+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x, algorithm="giac
")
```

```
[Out] 2/3*B*d^3*log(b*x + a)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g^4 + 3*a^2*b^2*c*d^2*g
^4 - a^3*b*d^3*g^4) - 2/3*B*d^3*log(d*x + c)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g
^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*log((d^2*x^2 + 2*c*d*x +
c^2)/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*
g^4*x + a^3*b*g^4) + 1/9*(6*B*b^2*d^2*x^2 - 3*B*b^2*c*d*x + 15*B*a*b*d^2*x
- 3*A*b^2*c^2 - B*b^2*c^2 + 6*A*a*b*c*d - B*a*b*c*d - 3*A*a^2*d^2 + 8*B*a^2
*d^2)/(b^6*c^2*g^4*x^3 - 2*a*b^5*c*d*g^4*x^3 + a^2*b^4*d^2*g^4*x^3 + 3*a*b^
5*c^2*g^4*x^2 - 6*a^2*b^4*c*d*g^4*x^2 + 3*a^3*b^3*d^2*g^4*x^2 + 3*a^2*b^4*c
^2*g^4*x - 6*a^3*b^3*c*d*g^4*x + 3*a^4*b^2*d^2*g^4*x + a^3*b^3*c^2*g^4 - 2*
a^4*b^2*c*d*g^4 + a^5*b*d^2*g^4)
```

maple [**B**] time = 0.06, size = 427, normalized size = 2.41

$$\frac{2B\,a^3d^3}{9\,(ad-bc)^3\,(bx+a)^3\,b\,g^4}-\frac{2B\,a^2c\,d^2}{3\,(ad-bc)^3\,(bx+a)^3\,g^4}+\frac{2Bab\,c^2d}{3\,(ad-bc)^3\,(bx+a)^3\,g^4}+\frac{2Ba\,d^4\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{3\,(ad-bc)^4\,b\,g^4}-\frac{}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3/b/(b*x+a)^3/g^4*A-1/3/b/g^4*B/(b*x+a)^3*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*
c-d)^2/b^2*e)+2/9/b/g^4*B*a^3*d^3/(a*d-b*c)^3/(b*x+a)^3-2/3/g^4*B*a^2*d^2/(
a*d-b*c)^3/(b*x+a)^3*c+2/3*b/g^4*B*a*d/(a*d-b*c)^3/(b*x+a)^3*c^2+1/3/b/g^4*
B*a^2*d^3/(a*d-b*c)^3/(b*x+a)^2-2/3/g^4*B*a*d^2/(a*d-b*c)^3/(b*x+a)^2*c+2/3
/b/g^4*B*a*d^3/(a*d-b*c)^3/(b*x+a)+2/3/b/g^4*B*a*d^4/(a*d-b*c)^4*ln(1/(b*x+
a)*a*d-1/(b*x+a)*b*c-d)-2/9*b^2/g^4*B*c^3/(a*d-b*c)^3/(b*x+a)^3+1/3*b/g^4*B
*c^2/(a*d-b*c)^3/(b*x+a)^2*d-2/3/g^4*B*c/(a*d-b*c)^3/(b*x+a)*d^2-2/3/g^4*B*
c*d^3/(a*d-b*c)^4*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)
```

maxima [**B**] time = 1.22, size = 480, normalized size = 2.71

$$\frac{1}{9}\,B\left(\frac{6\,b^2d^2x^2+2\,b^2c^2-7\,abcd+11\,a^2d^2-3\left(b^2cd-5\,abd^2\right)x}{\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)g^4x^3+3\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\left(a^2b^4c^2-2\,a^3b^3cd+a^4b^2d^2\right)g^4x+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x, algorithm="maxi
ma")
```

```
[Out] 1/9*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5
*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2
- 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a
^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) - 3*log(
d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) +
 c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^
2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d
 + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^
2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

mupad [**B**] time = 6.73, size = 341, normalized size = 1.93

$$\frac{2\,B\,b\,c^2}{9\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{A\,b\,c^2}{3\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}-\frac{B\,\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)}{3\,b\,g^4\,(a+b\,x)^3}-\frac{A\,a^2\,d^2}{3\,b\,g^4\,(a\,d-b\,c)^2\,(a+b\,x)^3}+\frac{1}{9\,b\,g^4\,(a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))/(a*g + b*g*x)^4,x)
```

```
[Out] (B*d^3*atan((a*d*1i + b*c*1i + b*d*x*2i)/(a*d - b*c))*4i)/(3*b*g^4*(a*d - b
*c)^3) - (B*log((e*(c + d*x)^2)/(a + b*x)^2))/(3*b*g^4*(a + b*x)^3) - (A*b*
c^2)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) + (2*B*b*c^2)/(9*g^4*(a*d - b*c)^2*(
a + b*x)^3) - (A*a^2*d^2)/(3*b*g^4*(a*d - b*c)^2*(a + b*x)^3) + (11*B*a^2*d
^2)/(9*b*g^4*(a*d - b*c)^2*(a + b*x)^3) + (5*B*a*d^2*x)/(3*g^4*(a*d - b*c)^
2*(a + b*x)^3) + (2*B*b*d^2*x^2)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) + (2*A*a
*c*d)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3) - (7*B*a*c*d)/(9*g^4*(a*d - b*c)^2*
(a + b*x)^3) - (B*b*c*d*x)/(3*g^4*(a*d - b*c)^2*(a + b*x)^3)
```

sympy [B] time = 4.06, size = 677, normalized size = 3.82

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}+\frac{2Bd^3\log\left(x+\frac{-\frac{2Ba^4d^7}{(ad-bc)^3}+\frac{8Ba^3bcd^6}{(ad-bc)^3}-\frac{12Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{8Bab^3c^3d^4}{(ad-bc)^3}+2Bad^4-\frac{2Bb^4c^4d^3}{(ad-bc)^3}+2Bbcd}{4Bbd^4}\right.}{3bg^4(ad-bc)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9
*a*b**3*g**4*x**2 + 3*b**4*g**4*x**3) + 2*B*d**3*log(x + (-2*B*a**4*d**7/(a
*d - b*c)**3 + 8*B*a**3*b*c*d**6/(a*d - b*c)**3 - 12*B*a**2*b**2*c**2*d**5/
(a*d - b*c)**3 + 8*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 - 2*B*b**
4*c**4*d**3/(a*d - b*c)**3 + 2*B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b
*c)**3) - 2*B*d**3*log(x + (2*B*a**4*d**7/(a*d - b*c)**3 - 8*B*a**3*b*c*d**
6/(a*d - b*c)**3 + 12*B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 8*B*a*b**3*c**
3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 + 2*B*b**4*c**4*d**3/(a*d - b*c)**3 + 2*
B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) + (-3*A*a**2*d**2 + 6*A
*a*b*c*d - 3*A*b**2*c**2 + 11*B*a**2*d**2 - 7*B*a*b*c*d + 2*B*b**2*c**2 + 6
*B*b**2*d**2*x**2 + x*(15*B*a*b*d**2 - 3*B*b**2*c*d))/(9*a**5*b*d**2*g**4 -
 18*a**4*b**2*c*d*g**4 + 9*a**3*b**3*c**2*g**4 + x**3*(9*a**2*b**4*d**2*g**
4 - 18*a*b**5*c*d*g**4 + 9*b**6*c**2*g**4) + x**2*(27*a**3*b**3*d**2*g**4 -
 54*a**2*b**4*c*d*g**4 + 27*a*b**5*c**2*g**4) + x*(27*a**4*b**2*d**2*g**4 -
 54*a**3*b**3*c*d*g**4 + 27*a**2*b**4*c**2*g**4))
```

3.209 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=208

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}-\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}-$$

```
[Out] 1/8*B/b/g^5/(b*x+a)^4-1/6*B*d/b/(-a*d+b*c)/g^5/(b*x+a)^3+1/4*B*d^2/b/(-a*d+
b*c)^2/g^5/(b*x+a)^2-1/2*B*d^3/b/(-a*d+b*c)^3/g^5/(b*x+a)-1/2*B*d^4*ln(b*x+
a)/b/(-a*d+b*c)^4/g^5+1/2*B*d^4*ln(d*x+c)/b/(-a*d+b*c)^4/g^5+1/4*(-A-B*ln(e
*(d*x+c)^2/(b*x+a)^2))/b/g^5/(b*x+a)^4
```

Rubi [A] time = 0.14, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}-\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] B/(8*b*g^5*(a + b*x)^4) - (B*d)/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) + (B*d^2)
/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3)/(2*b*(b*c - a*d)^3*g^5*(a +
b*x)) - (B*d^4*Log[a + b*x])/(2*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x])
/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(4*b*g^
5*(a + b*x)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^5}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4bg^5(a+bx)^4}+\frac{B\int\frac{2(-bc+ad)}{g^4(a+bx)^5(c+dx)}\,dx}{4bg} \\ &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4bg^5(a+bx)^4}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^5(c+dx)}\,dx}{2bg^5} \\ &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4bg^5(a+bx)^4}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^5}-\frac{bd}{(bc-ad)^2(a+bx)^4}+\frac{bd^2}{(bc-ad)^3(a+bx)^3}\right.}{2bg^5} \\ &= \frac{B}{8bg^5(a+bx)^4}-\frac{Bd}{6b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2}{4b(bc-ad)^2g^5(a+bx)^2}-\frac{Bd^3}{2b(bc-ad)^3g^5}\end{aligned}$$

Mathematica [**A**] time = 0.17, size = 162, normalized size = 0.78

$$\frac{\frac{B\left(12d^4(a+bx)^4\log(c+dx)+12d^3(a+bx)^3(ad-bc)+6d^2(a+bx)^2(bc-ad)^2+4d(a+bx)(ad-bc)^3+3(bc-ad)^4-12d^4(a+bx)^4\log(a+bx)\right)}{(bc-ad)^4}-6\left(B\log\left(\frac{e(c+dx)}{(a+bx)}\right.\right.}{24bg^5(a+bx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] ((B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2
*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a
 + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]))/(b*c - a*d)^4 - 6*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(24*b*g^5*(a + b*x)^4)
```

fricas [**B**] time = 1.51, size = 658, normalized size = 3.16

$$-\frac{3\,(2\,A-B)b^4c^4-8\,(3\,A-2\,B)ab^3c^3d+36\,(A-B)a^2b^2c^2d^2-24\,(A-2\,B)a^3bcd^3+(6\,A-25\,B)a^4d^4+12\left(Bb^4c\right.}{24\left(\left(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\right)g^5x^4+4\left(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/24*(3*(2*A - B)*b^4*c^4 - 8*(3*A - 2*B)*a*b^3*c^3*d + 36*(A - B)*a^2*b^2
*c^2*d^2 - 24*(A - 2*B)*a^3*b*c*d^3 + (6*A - 25*B)*a^4*d^4 + 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 + 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 6*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*B
*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*
b*c*d^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((
b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4
)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*
c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5
*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*
b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4
*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^
4)*g^5)
```

giac [**B**] time = 0.69, size = 416, normalized size = 2.00

$$\frac{Bd^4\log\left(-\frac{bcg}{bgx+ag}+\frac{adg}{bgx+ag}-d\right)}{2\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+a^4bd^4g^5\right)}-\frac{Bd^3}{2\left(b^3c^3g^3-3\,ab^2c^2dg^3+3\,a^2bcd^2g^3-a^3d^3g^3\right)\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x, algorithm="giac
")
```

```
[Out] 1/2*B*d^4*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g) - d)/(b^5*c^4*g^5
- 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*d
^4*g^5) - 1/2*B*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 -
 a^3*d^3*g^3)*(b*g*x + a*g)*b*g) + 1/4*B*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a^
2*d^2*g)*(b*g*x + a*g)^2*b*g^2) - 1/4*B*log((b^2*c^2*g^2/(b*g*x + a*g)^2 -
2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*g/(b*
g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)/((b*g*x + a*g)^4*b*g) - 1/
6*B*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2) - 1/8*(2*A*b^3*g^3 + B*b^3*g^3)/(
(b*g*x + a*g)^4*b^4*g^4)
```

maple [B] time = 0.06, size = 587, normalized size = 2.82

$$\frac{B\,a^4d^4}{8\,(ad-bc)^4\,(bx+a)^4\,b\,g^5}-\frac{B\,a^3c\,d^3}{2\,(ad-bc)^4\,(bx+a)^4\,g^5}+\frac{3B\,a^2b\,c^2d^2}{4\,(ad-bc)^4\,(bx+a)^4\,g^5}-\frac{Ba\,b^2c^3d}{2\,(ad-bc)^4\,(bx+a)^4\,g^5}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x)
```

```
[Out] -1/4/b/(b*x+a)^4/g^5*A-1/4/b/g^5*B/(b*x+a)^4*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*
c-d)^2/b^2*e)+1/8/b/g^5*B*a^4*d^4/(a*d-b*c)^4/(b*x+a)^4-1/2/g^5*B*a^3*d^3/(
a*d-b*c)^4/(b*x+a)^4*c+3/4*b/g^5*B*a^2*d^2/(a*d-b*c)^4/(b*x+a)^4*c^2-1/2*b^
2/g^5*B*a*d/(a*d-b*c)^4/(b*x+a)^4*c^3+1/6/b/g^5*B*a^3*d^4/(a*d-b*c)^4/(b*x+
a)^3-1/2/g^5*B*a^2*d^3/(a*d-b*c)^4/(b*x+a)^3*c+1/2*b/g^5*B*a*d^2/(a*d-b*c)^
4/(b*x+a)^3*c^2+1/4/b/g^5*B*a^2*d^4/(a*d-b*c)^4/(b*x+a)^2-1/2/g^5*B*a*d^3/(
a*d-b*c)^4/(b*x+a)^2*c+1/2/b/g^5*B*a*d^4/(a*d-b*c)^4/(b*x+a)+1/2/b/g^5*B*a*
d^5/(a*d-b*c)^5*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)+1/8*b^3/g^5*B*c^4/(a*d-b*
c)^4/(b*x+a)^4-1/6*b^2/g^5*B*c^3/(a*d-b*c)^4/(b*x+a)^3*d+1/4*b/g^5*B*c^2/(a
*d-b*c)^4/(b*x+a)^2*d^2-1/2/g^5*B*c/(a*d-b*c)^4/(b*x+a)*d^3-1/2/g^5*B*c*d^4
/(a*d-b*c)^5*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)
```

maxima [B] time = 1.38, size = 699, normalized size = 3.36

$$-\frac{1}{24}\,B\left(\frac{12\,b^3d^3x^3-3\,b^3c^3+13\,ab^2c^2d-23\,a^2}{\left(b^8c^3-3\,ab^7c^2d+3\,a^2b^6cd^2-a^3b^5d^3\right)g^5x^4+4\left(ab^7c^3-3\,a^2b^6c^2d+3\,a^3b^5cd^2-a^4b^4d^3\right)g^5x^3+6\left(a^2b^6\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x, algorithm="maxi
ma")
```

```
[Out] -1/24*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25
*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3
)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)
*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3
)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^
5) + 6*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b
*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/(
(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)
*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
```

```
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

mupad [**B**] time = 7.90, size = 579, normalized size = 2.78

$$\frac{B\,d^4\,\mathrm{atanh}\left(\frac{-2\,a^4\,b\,d^4\,g^5+4\,a^3\,b^2\,c\,d^3\,g^5-4\,a\,b^4\,c^3\,d\,g^5+2\,b^5\,c^4\,g^5}{2\,b\,g^5\,(a\,d-b\,c)^4}-\frac{2\,b\,d\,x\,\left(a^3\,d^3-3\,a^2\,b\,c\,d^2+3\,a\,b^2\,c^2\,d-b^3\,c^3\right)}{(a\,d-b\,c)^4}\right)}{b\,g^5\,(a\,d-b\,c)^4}-\frac{B\,\ln\left(\right.}{4\,b^2\,g^5\,\left(4\,a^3\,x+\frac{a^4}{b}+b^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))/(a*g + b*g*x)^5,x)
```

```
[Out] (B*d^4*atanh((2*b^5*c^4*g^5 - 2*a^4*b*d^4*g^5 - 4*a*b^4*c^3*d*g^5 + 4*a^3*b
^2*c*d^3*g^5)/(2*b*g^5*(a*d - b*c)^4) - (2*b*d*x*(a^3*d^3 - b^3*c^3 + 3*a*b
^2*c^2*d - 3*a^2*b*c*d^2))/(a*d - b*c)^4))/(b*g^5*(a*d - b*c)^4) - (B*log((
e*(c + d*x)^2)/(a + b*x)^2))/(4*b^2*g^5*(4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*
b*x^2 + 4*a*b^2*x^3)) - ((6*A*a^3*d^3 - 6*A*b^3*c^3 - 25*B*a^3*d^3 + 3*B*b^
3*c^3 + 18*A*a*b^2*c^2*d - 18*A*a^2*b*c*d^2 - 13*B*a*b^2*c^2*d + 23*B*a^2*b
*c*d^2)/(12*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) + (d^2*x^2
*(B*b^3*c - 7*B*a*b^2*d))/(2*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c
*d^2)) - (d*x*(B*b^3*c^2 + 13*B*a^2*b*d^2 - 5*B*a*b^2*c*d))/(3*(a^3*d^3 - b
^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2)) - (B*b^3*d^3*x^3)/(a^3*d^3 - b^3*c
^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^2))/(2*a^4*b*g^5 + 2*b^5*g^5*x^4 + 8*a^3*b
^2*g^5*x + 8*a*b^4*g^5*x^3 + 12*a^2*b^3*g^5*x^2)
```

sympy [**B**] time = 5.68, size = 947, normalized size = 4.55

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4a^4bg^5+16a^3b^2g^5x+24a^2b^3g^5x^2+16ab^4g^5x^3+4b^5g^5x^4}+\frac{Bd^4\log\left(x+\frac{-\frac{Ba^5d^9}{(ad-bc)^4}+\frac{5Ba^4bcd^8}{(ad-bc)^4}-\frac{10Ba^3b^2c^2d^7}{(ad-bc)^4}+\frac{10Ba^2b^3c^3d^6}{(ad-bc)^4}-}{2Bbd^5}\right.}{2bg^5\,(ad-bc)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x +
24*a**2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) + B*d**4*l
og(x + (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10
*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c
)**4 - 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a
*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) - B*d**4
*log(x + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 1
0*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*
c)**4 + 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(
a*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) + (-6*A
*a**3*d**3 + 18*A*a**2*b*c*d**2 - 18*A*a*b**2*c**2*d + 6*A*b**3*c**3 + 25*B
*a**3*d**3 - 23*B*a**2*b*c*d**2 + 13*B*a*b**2*c**2*d - 3*B*b**3*c**3 + 12*B
*b**3*d**3*x**3 + x**2*(42*B*a*b**2*d**3 - 6*B*b**3*c*d**2) + x*(52*B*a**2*
b*d**3 - 20*B*a*b**2*c*d**2 + 4*B*b**3*c**2*d))/(24*a**7*b*d**3*g**5 - 72*a
**6*b**2*c*d**2*g**5 + 72*a**5*b**3*c**2*d*g**5 - 24*a**4*b**4*c**3*g**5 +
x**4*(24*a**3*b**5*d**3*g**5 - 72*a**2*b**6*c*d**2*g**5 + 72*a*b**7*c**2*d*
g**5 - 24*b**8*c**3*g**5) + x**3*(96*a**4*b**4*d**3*g**5 - 288*a**3*b**5*c*
d**2*g**5 + 288*a**2*b**6*c**2*d*g**5 - 96*a*b**7*c**3*g**5) + x**2*(144*a*
*5*b**3*d**3*g**5 - 432*a**4*b**4*c*d**2*g**5 + 432*a**3*b**5*c**2*d*g**5 -
 144*a**2*b**6*c**3*g**5) + x*(96*a**6*b**2*d**3*g**5 - 288*a**5*b**3*c*d**
2*g**5 + 288*a**4*b**4*c**2*d*g**5 - 96*a**3*b**5*c**3*g**5))
```

3.210 $\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=515

$$-\frac{4Bg^4(bc-ad)^5\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5bd^5}-\frac{4Bg^4(c+dx)(bc-ad)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5d^5}+\frac{2Bg^4}{}$$

```
[Out] 26/15*B^2*(-a*d+b*c)^4*g^4*x/d^4-7/15*B^2*(-a*d+b*c)^3*g^4*(b*x+a)^2/b/d^3+
2/15*B^2*(-a*d+b*c)^2*g^4*(b*x+a)^3/b/d^2-10/3*B^2*(-a*d+b*c)^5*g^4*ln(b*x+
a)/b/d^5-26/15*B^2*(-a*d+b*c)^5*g^4*ln((d*x+c)/(b*x+a))/b/d^5+2/5*B*(-a*d+b
*c)^3*g^4*(b*x+a)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/d^3-4/15*B*(-a*d+b*c)
^2*g^4*(b*x+a)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/d^2+1/5*B*(-a*d+b*c)*g^4
*(b*x+a)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/d-4/5*B*(-a*d+b*c)^4*g^4*(d*x+
c)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/d^5+1/5*g^4*(b*x+a)^5*(A+B*ln(e*(d*x+c)^
2/(b*x+a)^2))^2/b-4/5*B*(-a*d+b*c)^5*g^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))*ln
(1-d*(b*x+a)/b/(d*x+c))/b/d^5+8/5*B^2*(-a*d+b*c)^5*g^4*polylog(2,d*(b*x+a)/
b/(d*x+c))/b/d^5
```

Rubi [A] time = 0.86, antiderivative size = 569, normalized size of antiderivative = 1.10, number of steps used = 28, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}+\frac{4Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5bd^5}+\frac{2Bg^4(a+bx)^2(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (-4*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (26*B^2*(b*c - a*d)^4*g^4*x)/(15*d^4
) - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(15*b*d^3) + (2*B^2*(b*c - a*d)^2
*g^4*(a + b*x)^3)/(15*b*d^2) - (10*B^2*(b*c - a*d)^5*g^4*Log[c + d*x])/(3*b
*d^5) + (8*B^2*(b*c - a*d)^5*g^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/(5*b*d^5) - (4*B^2*(b*c - a*d)^5*g^4*Log[c + d*x]^2)/(5*b*d^5) - (4*B
^2*(b*c - a*d)^4*g^4*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(5*b*d^4)
+ (2*B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(5*b*d^3) - (4*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(A + B*Log[(e*(c + d*x)^
2)/(a + b*x)^2]))/(15*b*d^2) + (B*(b*c - a*d)*g^4*(a + b*x)^4*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(5*b*d) + (4*B*(b*c - a*d)^5*g^4*Log[c + d*x]*
(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b*d^5) + (g^4*(a + b*x)^5*(A +
 B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(5*b) + (8*B^2*(b*c - a*d)^5*g^4*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(5*b*d^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{(2B)\int \frac{2(bc-ad)g^5(a+bx)^4\left(-A\right.}{c+dx}}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int \frac{(a+bx)^4}{}}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int\left(-\frac{b(bc-}{}\right.}{}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int(a+bx}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{2B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(c-}{(a-}\right.\right.}{5bd^3}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} - \frac{4B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{5bd^4} +$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} - \frac{8B^2(bc-ad)^5g^4\log(c+dx)}{5bd^5} - \frac{4B^2(bc-}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a}{15bd^3}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a}{15bd^3}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a}{15bd^3}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a}{15bd^3}$$

Mathematica [A] time = 0.47, size = 524, normalized size = 1.02

$$\frac{g^4\Bigg((a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2-\frac{B(bc-ad)\Big(-3d^4(a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+4d^3(a+bx)^3(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-6d^2(a+bx)^2}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 - (B*(b*c - a*
d)*(12*A*b*d*(b*c - a*d)^3*x + 24*B*(b*c - a*d)^4*Log[c + d*x] - 4*B*(b*c -
 a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*
x]) - B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)
^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) - 12*B*(b*c - a*d)^3
*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*d*(b*c - a*d)^3*(a + b*x)*Log
[(e*(c + d*x)^2)/(a + b*x)^2] - 6*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[
(e*(c + d*x)^2)/(a + b*x)^2]) + 4*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]) - 3*d^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/
(a + b*x)^2]) - 12*(b*c - a*d)^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a
 + b*x)^2]) - 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^
5)))/(5*b)
```

fricas [F] time = 0.71, size = 0, normalized size = 0.00

$$\mathrm{integral}\Big(A^2b^4g^4x^4+4\,A^2ab^3g^4x^3+6\,A^2a^2b^2g^4x^2+4\,A^2a^3bg^4x+A^2a^4g^4+\big(B^2b^4g^4x^4+4\,B^2ab^3g^4x^3+6\,B^2a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((d^2*e*x^2 + 2*c
*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a
*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log
((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(bgx+ag\right)^4\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^4*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

maple [F] time = 1.36, size = 0, normalized size = 0.00

$$\int\left(bgx+ag\right)^4\left(B\ln\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

maxima [B] time = 2.60, size = 2660, normalized size = 5.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*
x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/
b + 2*c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b
*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x
+ a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x
/(b*d))*A*B*a^3*b*g^4 + 4*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*
c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^
3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 2/3*(3*x^4*log(d^2*e*x^
2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(
b^2*x^2 + 2*a*b*x + a^2)) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4
 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*
c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/15*(6*x^5*log(d^2*e*x^2/(b^2
*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^
2 + 2*a*b*x + a^2)) - 12*a^5*log(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (
3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*
c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 +
 A^2*a^4*g^4*x + 2/15*((6*g^4*log(e) - 25*g^4)*b^4*c^5 - (30*g^4*log(e) - 1
13*g^4)*a*b^3*c^4*d + 4*(15*g^4*log(e) - 49*g^4)*a^2*b^2*c^3*d^2 - 12*(5*g^
4*log(e) - 13*g^4)*a^3*b*c^2*d^3 + 6*(5*g^4*log(e) - 8*g^4)*a^4*c*d^4)*B^2*
log(d*x + c)/d^5 - 8/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^
2*g^4 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^5) + 1/15*(3*B^2*b^5*d^5*g^4*x^5*log(e)^2 + 3*(b^5*c*d^4*g^4*log
(e) + (5*g^4*log(e)^2 - g^4*log(e))*a*b^4*d^5)*B^2*x^4 - 2*((2*g^4*log(e) -
 g^4)*b^5*c^2*d^3 - 2*(5*g^4*log(e) - g^4)*a*b^4*c*d^4 - (15*g^4*log(e)^2 -
 8*g^4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 + ((6*g^4*log(e) - 7*g^4)*b^5*c^3
*d^2 - 3*(10*g^4*log(e) - 9*g^4)*a*b^4*c^2*d^3 + 3*(20*g^4*log(e) - 11*g^4)
*a^2*b^3*c*d^4 + (30*g^4*log(e)^2 - 36*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^
2*x^2 - (2*(6*g^4*log(e) - 13*g^4)*b^5*c^4*d - 2*(30*g^4*log(e) - 59*g^4)*a
*b^4*c^3*d^2 + 12*(10*g^4*log(e) - 17*g^4)*a^2*b^3*c^2*d^3 - 2*(60*g^4*log(
e) - 79*g^4)*a^3*b^2*c*d^4 - (15*g^4*log(e)^2 - 48*g^4*log(e) + 46*g^4)*a^4
*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*
a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x +
B^2*a^5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5
*g^4*x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*
a^4*b*d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4
 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 - 2*(6*B
^2*b^5*d^5*g^4*x^5*log(e) + 3*(b^5*c*d^4*g^4 + (10*g^4*log(e) - g^4)*a*b^4*
d^5)*B^2*x^4 - 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - (15*g^4*log(e) - 4*
g^4)*a^2*b^3*d^5)*B^2*x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a
^2*b^3*c*d^4*g^4 + 2*(5*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 6*(2*b^5
*c^4*d*g^4 - 10*a*b^4*c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d
^4*g^4 - (5*g^4*log(e) - 8*g^4)*a^4*b*d^5)*B^2*x - (12*a*b^4*c^4*d*g^4 - 54
*a^2*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 - (6*g^4
*log(e) - 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) + 2*(6*B^2*b^5*d^5*g^4*x^5*log
(e) + 3*(b^5*c*d^4*g^4 + (10*g^4*log(e) - g^4)*a*b^4*d^5)*B^2*x^4 - 4*(b^5*
```

```
c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - (15*g^4*log(e) - 4*g^4)*a^2*b^3*d^5)*B^2*
x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 + 2*(
5*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 6*(2*b^5*c^4*d*g^4 - 10*a*b^4*
c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d^4*g^4 - (5*g^4*log(e)
 - 8*g^4)*a^4*b*d^5)*B^2*x - 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*
x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b
*d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g + b g x\right)^4 \left(A + B \ln\left(\frac{e (c + d x)^2}{(a + b x)^2}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^4*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^4*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

3.211 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx$

Optimal. Leaf size=422

$$\frac{Bg^3(bc-ad)^4\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^4}+\frac{Bg^3(c+dx)(bc-ad)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{d^4}-Bg^3(a+b$$

```
[Out] -5/3*B^2*(-a*d+b*c)^3*g^3*x/d^3+1/3*B^2*(-a*d+b*c)^2*g^3*(b*x+a)^2/b/d^2+11
/3*B^2*(-a*d+b*c)^4*g^3*ln(b*x+a)/b/d^4+5/3*B^2*(-a*d+b*c)^4*g^3*ln((d*x+c)
/(b*x+a))/b/d^4-1/2*B*(-a*d+b*c)^2*g^3*(b*x+a)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a
)^2))/b/d^2+1/3*B*(-a*d+b*c)*g^3*(b*x+a)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/
b/d+B*(-a*d+b*c)^3*g^3*(d*x+c)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/d^4+1/4*g^3*
(b*x+a)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/b+B*(-a*d+b*c)^4*g^3*(A+B*ln(e*
(d*x+c)^2/(b*x+a)^2))*ln(1-d*(b*x+a)/b/(d*x+c))/b/d^4-2*B^2*(-a*d+b*c)^4*g^
3*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^4
```

Rubi [A] time = 0.74, antiderivative size = 469, normalized size of antiderivative = 1.11, number of steps used = 24, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{2B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^4}-\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^4}-Bg^3(a+bx)^2(bc-a$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^3*g^3*x)/d^3 - (5*B^2*(b*c - a*d)^3*g^3*x)/(3*d^3) + (B^2*
(b*c - a*d)^2*g^3*(a + b*x)^2)/(3*b*d^2) + (11*B^2*(b*c - a*d)^4*g^3*Log[c
+ d*x])/(3*b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(b*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[c + d*x]^2)/(b*d^4)
+ (B^2*(b*c - a*d)^3*g^3*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(b*d^3
) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(2*b*d^2) + (B*(b*c - a*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(
a + b*x)^2]))/(3*b*d) - (B*(b*c - a*d)^4*g^3*Log[c + d*x]*(A + B*Log[(e*(c
+ d*x)^2)/(a + b*x)^2]))/(b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x)
^2)/(a + b*x)^2])^2)/(4*b) - (2*B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])/(b*d^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{B\int\frac{2(bc-ad)g^4(a+bx)^3\left(-A-B\,\mathrm{l}\right.}{c+dx}}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3\left(-\right.}{}}{b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)}{}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int(a+bx)}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right.\right.}{2bd^2}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} + \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bd^3} - \frac{B(b}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} + \frac{2B^2(bc-ad)^4g^3\log(c+dx)}{bd^4} + \frac{B^2(bc-ad)}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{3bd^2}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{3bd^2}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{3bd^2}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx}{3bd^2}$$

Mathematica [A] time = 0.32, size = 402, normalized size = 0.95

$$g^3\left(\frac{2B(bc-ad)\left(2d^3(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+3d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-6(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+6Abdx(bc-\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (2*B*(b*c -
a*d)*(6*A*b*d*(b*c - a*d)^2*x + 12*B*(b*c - a*d)^3*Log[c + d*x] - 2*B*(b*c
- a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x
]) - 6*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 6*B*d*(b*c -
 a*d)^2*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2] + 3*d^2*(-(b*c) + a*d)*(
a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + 2*d^3*(a + b*x)^3*(A
+ B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 6*(b*c - a*d)^3*Log[c + d*x]*(A + B
*Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 6*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])))/(3*d^4)))/(4*b)
```

fricas [F]   time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\mathrm{l}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2
*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*
log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^{3} \left(B\log\left(\frac{(dx + c)^{2} e}{(bx + a)^{2}}\right) + A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

maple [F]   time = 1.24, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)^{3} \left(B\ln\left(\frac{(dx + c)^{2} e}{(bx + a)^{2}}\right) + A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [B]   time = 2.60, size = 1950, normalized size = 4.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) +
 c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d
)*A*B*a^3*g^3 + 3*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/
(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*
x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3
+ 2*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a
*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2
*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)
/(b^2*d^2))*A*B*a*b^2*g^3 + 1/6*(3*x^4*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a
^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)
) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2
*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d
^3))*A*B*b^3*g^3 + A^2*a^3*g^3*x - 1/3*((3*g^3*log(e) - 11*g^3)*b^3*c^4 - 2
*(6*g^3*log(e) - 19*g^3)*a*b^2*c^3*d + 9*(2*g^3*log(e) - 5*g^3)*a^2*b*c^2*d
^2 - 6*(2*g^3*log(e) - 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 2*(b^4*c^4*
g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d
^4*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 4*(
b^4*c*d^3*g^3*log(e) + (3*g^3*log(e)^2 - g^3*log(e))*a*b^3*d^4)*B^2*x^3 - 2
*((3*g^3*log(e) - 2*g^3)*b^4*c^2*d^2 - 4*(3*g^3*log(e) - g^3)*a*b^3*c*d^3 -
 (9*g^3*log(e)^2 - 9*g^3*log(e) + 2*g^3)*a^2*b^2*d^4)*B^2*x^2 + 4*((3*g^3*l
og(e) - 5*g^3)*b^4*c^3*d - (12*g^3*log(e) - 17*g^3)*a*b^3*c^2*d^2 + (18*g^3
*log(e) - 19*g^3)*a^2*b^2*c*d^3 + (3*g^3*log(e)^2 - 9*g^3*log(e) + 7*g^3)*a
^3*b*d^4)*B^2*x + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2
*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a
)^2 + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4
*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2
*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 - 4*(3*B^2*b^4*d^
4*g^3*x^4*log(e) + 2*(b^4*c*d^3*g^3 + (6*g^3*log(e) - g^3)*a*b^3*d^4)*B^2*x
^3 - 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 - 3*(2*g^3*log(e) - g^3)*a^2*b^
2*d^4)*B^2*x^2 + 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g
^3 + (2*g^3*log(e) - 3*g^3)*a^3*b*d^4)*B^2*x + (6*a*b^3*c^3*d*g^3 - 21*a^2*
b^2*c^2*d^2*g^3 + 26*a^3*b*c*d^3*g^3 + (3*g^3*log(e) - 11*g^3)*a^4*d^4)*B^2
)*log(b*x + a) + 4*(3*B^2*b^4*d^4*g^3*x^4*log(e) + 2*(b^4*c*d^3*g^3 + (6*g^
3*log(e) - g^3)*a*b^3*d^4)*B^2*x^3 - 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3
 - 3*(2*g^3*log(e) - g^3)*a^2*b^2*d^4)*B^2*x^2 + 6*(b^4*c^3*d*g^3 - 4*a*b^3
*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 + (2*g^3*log(e) - 3*g^3)*a^3*b*d^4)*B^2*
x - 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c)
)/(b*d^4)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a\,g+b\,g\,x\right)^3\,{\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

3.212 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 \, dx$

Optimal. Leaf size=343

$$-\frac{4Bg^2(bc-ad)^3\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bd^3}-\frac{4Bg^2(c+dx)(bc-ad)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3d^3}+ 2Bg^2(a -$$

```
[Out] 4/3*B^2*(-a*d+b*c)^2*g^2*x/d^2-4*B^2*(-a*d+b*c)^3*g^2*ln(b*x+a)/b/d^3-4/3*B
^2*(-a*d+b*c)^3*g^2*ln((d*x+c)/(b*x+a))/b/d^3+2/3*B*(-a*d+b*c)*g^2*(b*x+a)^
2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/d-4/3*B*(-a*d+b*c)^2*g^2*(d*x+c)*(A+B*l
n(e*(d*x+c)^2/(b*x+a)^2))/d^3+1/3*g^2*(b*x+a)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)
^2))^2/b-4/3*B*(-a*d+b*c)^3*g^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))*ln(1-d*(b*x
+a)/b/(d*x+c))/b/d^3+8/3*B^2*(-a*d+b*c)^3*g^2*polylog(2,d*(b*x+a)/b/(d*x+c)
)/b/d^3
```

Rubi [A] time = 0.63, antiderivative size = 397, normalized size of antiderivative = 1.16, number of steps used = 20, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.382$, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}+\frac{4Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bd^3}-\frac{4ABg^2x(bc-ad)^2}{3d^2}+ 2B$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (-4*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (4*B^2*(b*c - a*d)^2*g^2*x)/(3*d^2)
- (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (8*B^2*(b*c - a*d)^3*g^2
*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (4*B^2*(b*c -
a*d)^3*g^2*Log[c + d*x]^2)/(3*b*d^3) - (4*B^2*(b*c - a*d)^2*g^2*(a + b*x)*L
og[(e*(c + d*x)^2)/(a + b*x)^2])/(3*b*d^2) + (2*B*(b*c - a*d)*g^2*(a + b*x)
^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*d) + (4*B*(b*c - a*d)^3*g
^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*d^3) + (g^2*
(a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(3*b) + (8*B^2*(b*c
 - a*d)^3*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{(2B)\int\frac{2(bc-ad)g^3(a+bx)^2\left(-A-B1\right.}{c+dx}}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int\frac{(a+bx)^2\left(-A\right.}{}}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{}\right.}{}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int(a+bx)\left(\right.}{3d}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{2B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right.\right.}{3bd}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bd^2} + \frac{2B}{}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} - \frac{8B^2(bc-ad)^3g^2\log(c+dx)}{3bd^3} - \frac{4B^2(bc-ad}{}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c}{bd^3}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c}{bd^3}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c}{bd^3}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c}{bd^3}$$

Mathematica [A] time = 0.23, size = 298, normalized size = 0.87

$$\frac{g^2\left((a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2 - \frac{2B(bc-ad)\left(-d^2(a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+2Abdx(bc-\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 - (2*B*(b*c -
a*d)*(2*A*b*d*(b*c - a*d)*x + 4*B*(b*c - a*d)^2*Log[c + d*x] - 2*B*(b*c - a
*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log
[(e*(c + d*x)^2)/(a + b*x)^2] - d^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/
(a + b*x)^2]) - 2*(b*c - a*d)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a
+ b*x)^2]) - 2*B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(
3*b)
```

fricas [F] time = 2.20, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^2b^2g^2x^2+2\,A^2abg^2x+A^2a^2g^2+\left(B^2b^2g^2x^2+2\,B^2abg^2x+B^2a^2g^2\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*
x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^
2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^2\left(B\log\left(\frac{\left(dx+c\right)^2e}{\left(bx+a\right)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

maple [F] time = 1.15, size = 0, normalized size = 0.00

$$\int \left(bgx+ag\right)^2\left(B\ln\left(\frac{\left(dx+c\right)^2e}{\left(bx+a\right)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [B] time = 1.70, size = 1333, normalized size = 3.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b
*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x
+ a^2)) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log
(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2)
+ c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x
```

```
 + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 2/3*(x^3*log(d^2*e*x^2/(b^
2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x
^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 +
A^2*a^2*g^2*x + 4/3*((g^2*log(e) - 3*g^2)*b^2*c^3 - (3*g^2*log(e) - 7*g^2)*
a*b*c^2*d + (3*g^2*log(e) - 4*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 8/3*(b
^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 + (2*b^3*c*d^2*g^2*log(e)
 + (3*g^2*log(e)^2 - 2*g^2*log(e))*a*b^2*d^3)*B^2*x^2 - (4*(g^2*log(e) - g^
2)*b^3*c^2*d - 4*(3*g^2*log(e) - 2*g^2)*a*b^2*c*d^2 - (3*g^2*log(e)^2 - 8*g
^2*log(e) + 4*g^2)*a^2*b*d^3)*B^2*x + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*
d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + 4*(
B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^
3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 - 4*
(B^2*b^3*d^3*g^2*x^3*log(e) + (b^3*c*d^2*g^2 + (3*g^2*log(e) - g^2)*a*b^2*d
^3)*B^2*x^2 - (2*b^3*c^2*d*g^2 - 6*a*b^2*c*d^2*g^2 - (3*g^2*log(e) - 4*g^2)
*a^2*b*d^3)*B^2*x - (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 - (g^2*log(e) -
3*g^2)*a^3*d^3)*B^2)*log(b*x + a) + 4*(B^2*b^3*d^3*g^2*x^3*log(e) + (b^3*c*
d^2*g^2 + (3*g^2*log(e) - g^2)*a*b^2*d^3)*B^2*x^2 - (2*b^3*c^2*d*g^2 - 6*a*
b^2*c*d^2*g^2 - (3*g^2*log(e) - 4*g^2)*a^2*b*d^3)*B^2*x - 2*(B^2*b^3*d^3*g^
2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*
log(b*x + a))*log(d*x + c))/(b*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g+b g x\right)^{2} \left(A+B \ln\left(\frac{e \left(c+d x\right)^{2}}{\left(a+b x\right)^{2}}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

3.213 $\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=211

$$\frac{2Bg(bc-ad)^2\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^2}+\frac{2Bg(c+dx)(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{d^2}+\frac{g(a+bx)}{}$$

```
[Out] 4*B^2*(-a*d+b*c)^2*g*ln(b*x+a)/b/d^2+2*B*(-a*d+b*c)*g*(d*x+c)*(A+B*ln(e*(d*
x+c)^2/(b*x+a)^2))/d^2+1/2*g*(b*x+a)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/b+
2*B*(-a*d+b*c)^2*g*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))*ln(1-d*(b*x+a)/b/(d*x+c)
)/b/d^2-4*B^2*(-a*d+b*c)^2*g*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d^2
```

Rubi [A] time = 0.50, antiderivative size = 291, normalized size of antiderivative = 1.38, number of steps used = 16, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.375$, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{4B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}-\frac{2Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(c}{(a}\right.\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)*g*x)/d + (4*B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) -
(4*B^2*(b*c - a*d)^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d
^2) + (2*B^2*(b*c - a*d)^2*g*Log[c + d*x]^2)/(b*d^2) + (2*B^2*(b*c - a*d)*g
*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(b*d) - (2*B*(b*c - a*d)^2*g*L
og[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*d^2) + (g*(a + b*x
)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(2*b) - (4*B^2*(b*c - a*d)^
2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{B\int \frac{2(bc-ad)g^2(a+bx)(-A-B\log(}{c+dx}}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int \frac{(a+bx)(-A-}{c}}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int \left(\frac{b(-A-B\log}{}\right.}{}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int (-A-B\,\mathrm{l}}{d}$$

$$= \frac{2AB(bc-ad)gx}{d} - \frac{2B(bc-ad)^2g\log(c+dx)\left(A+B\log\left(\frac{e(c+dx}{(a+bx)}\right.\right.}{bd^2}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bd} - \frac{2B(bc}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} + \frac{2B^2(bc-ad)g}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} + \frac{2B^2(bc-ad)g}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{4B^2(bc-ad)^2g}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{4B^2(bc-ad)^2g}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{4B^2(bc-ad)^2g}{}$$

Mathematica [A] time = 0.17, size = 195, normalized size = 0.92

$$\frac{g\left(\frac{4B(bc-ad)\left(-(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+2B\log\left(\frac{d(a+bx)}{ad-bc}\right)+A-2B\right)+Bd(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+(2aBd-2bBc)\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)+B(bc-ad)\log^2(\right.}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (4*B*(b*c - a*
d)*(A*b*d*x + B*(b*c - a*d)*Log[c + d*x]^2 + B*d*(a + b*x)*Log[(e*(c + d*x)
^2)/(a + b*x)^2] - (b*c - a*d)*Log[c + d*x]*(A - 2*B + 2*B*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + (-2*b*B*c + 2*a*B
*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/d^2))/(2*b)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{d^2ex^2 + 2\,cdex + c^2e}{b^2x^2 + 2\,abx + a^2}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{d^2ex^2 + 2\,cde}{b^2x^2 + 2\,abx}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d^2*e*x^2 + 2*c*d
*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((d
^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)\left(B\log\left(\frac{(dx + c)^2e}{(bx + a)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

maple [F] time = 0.92, size = 0, normalized size = 0.00

$$\int \left(bgx + ag\right)\left(B\ln\left(\frac{(dx + c)^2\,e}{(bx + a)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)*(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [B] time = 2.09, size = 730, normalized size = 3.46

$$\frac{1}{2}\,A^2bgx^2+2\left(x\log\left(\frac{d^2ex^2}{b^2x^2 + 2\,abx + a^2} + \frac{2\,cdex}{b^2x^2 + 2\,abx + a^2} + \frac{c^2e}{b^2x^2 + 2\,abx + a^2}\right) - \frac{2\,a\log\left(bx + a\right)}{b} + \frac{2\,c\log\left(dx\right.}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/
(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x
+ a)/b + 2*c*log(d*x + c)/d)*A*B*a*g + (x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*
x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x +
 a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/
(b*d))*A*B*b*g + A^2*a*g*x - 2*((g*log(e) - 2*g)*b*c^2 - 2*(g*log(e) - g)*a
*c*d)*B^2*log(d*x + c)/d^2 + 4*(b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b
*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*
d)))*B^2/(b*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(2*b^2*c*d*g*log(e)
+ (g*log(e)^2 - 2*g*log(e))*a*b*d^2)*B^2*x + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a)^2 + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x - (b^2*c^2*g - 2*a*b*c*d*g)*B^2)*log(d*x + c)^2 - 4*(B^2*b^2*d^2
*g*x^2*log(e) + 2*((g*log(e) - g)*a*b*d^2 + b^2*c*d*g)*B^2*x + ((g*log(e) -
```

```
 2*g)*a^2*d^2 + 2*a*b*c*d*g)*B^2)*log(b*x + a) + 4*(B^2*b^2*d^2*g*x^2*log(e
) + 2*((g*log(e) - g)*a*b*d^2 + b^2*c*d*g)*B^2*x - 2*(B^2*b^2*d^2*g*x^2 + 2
*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(a g + b g x\right) \left(A + B \ln\left(\frac{e (c + d x)^2}{(a + b x)^2}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

3.214 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=132

$$-\frac{4B\text{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{bg}+\frac{8B^2\text{Li}_3\left(\frac{b(c+dx)}{d(a+bx)}\right)}{bg}$$

```
[Out] -ln((a*d-b*c)/d/(b*x+a))*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/b/g-4*B*(A+B*ln(
e*(d*x+c)^2/(b*x+a)^2))*polylog(2,b*(d*x+c)/d/(b*x+a))/b/g+8*B^2*polylog(3,
b*(d*x+c)/d/(b*x+a))/b/g
```

Rubi [B] time = 4.08, antiderivative size = 740, normalized size of antiderivative = 5.61, number of steps used = 46, number of rules used = 23, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.676$, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2499, 2302, 30, 2396, 2433, 2374, 6589, 2500, 2440, 2434, 2375, 2317}

$$-\frac{4AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{4B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+\log\left(\frac{1}{(a+bx)^2}\right)+\log\left((c+dx)^2\right)\right)}{bg}-8B^2$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (2*A*B*Log[g*(a + b*x)]^2)/(b*g) + (4*B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (B^
2*Log[(a + b*x)^(-2)]^2*Log[c + d*x])/(b*g) - (4*B^2*Log[(a + b*x)^(-2)]*Lo
g[g*(a + b*x)]*Log[c + d*x])/(b*g) - (4*B^2*Log[g*(a + b*x)]^2*Log[c + d*x]
)/(b*g) + (B^2*Log[(a + b*x)^(-2)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g)
+ (4*B^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g) + (B^2*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^2]^2)/(b*g) - (B^2*Log[g*(a +
 b*x)]*Log[(c + d*x)^2]^2)/(b*g) - (4*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Lo
g[a*g + b*g*x]])/(b*g) + (4*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*(Log[(a + b*x
)^(-2)] + Log[(c + d*x)^2] - Log[(e*(c + d*x)^2)/(a + b*x)^2])*Log[a*g + b*
g*x])/(b*g) + ((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2*Log[a*g + b*g*x])
/(b*g) - (4*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g) +
(2*B^2*Log[(e*(c + d*x)^2)/(a + b*x)^2]*Log[a*g + b*g*x]^2)/(b*g) - (4*A*B*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (4*B^2*Log[(a + b*x)^(-2)
]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (4*B^2*(Log[(a + b*x)^(
-2)] + Log[(c + d*x)^2] - Log[(e*(c + d*x)^2)/(a + b*x)^2])*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(b*g) + (4*B^2*Log[(c + d*x)^2]*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/(b*g) - (8*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d
))])/(b*g) - (8*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
```

```
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)^2\Big(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\Big)\Big(A+B\log\Big(\frac{e(c}{(a}}{e(c+dx)^2}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)^2\Big(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\Big)\Big(A+B\log\Big(\frac{e(c}{(a}}{(c+dx)^2}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{2(bc-ad)e\Big(-A-B\log\Big(\frac{e(c+dx)^2}{(a+bx)^2}\Big)\Big)\log(ag+bgx}{(a+bx)(c+dx)}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \frac{\Big(-A-B\log\Big(\frac{e(c+dx)^2}{(a+bx)^2}\Big)\Big)\log(ag+b}{(a+bx)(c+dx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \Bigg(\frac{b\Big(-A-B\log\Big(\frac{e(c+dx)^2}{(a+bx)^2}\Big)\Big)\log(ag}{(bc-ad)(a+bx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \frac{\Big(-A-B\log\Big(\frac{e(c+dx)^2}{(a+bx)^2}\Big)\Big)\log(ag+bgx)}{a+bx}\,dx}{g} -$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \Bigg(\frac{A\log(ag+bgx)}{-a-bx}+\frac{B\log\Big(\frac{e(c+dx)^2}{(a+bx)^2}\Big)\log(ag+}{-a-bx}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4AB)\int \frac{\log(ag+bgx)}{-a-bx}\,dx}{g} - \frac{\left(4B^2\right)\int \frac{\log\Big(\frac{e(c+d}{(a+b}}{}}{}$$

$$= -\frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} + \frac{2B^2}{}$$

$$= -\frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{4B^2\log\left(\frac{b(c+dx)}{bc-ad}\right)\Big(\log\left(\frac{1}{(a+bx)^2}\right)+\log\big((c+d}{bg}$$

$$= \frac{2AB\log^2(g(a+bx))}{bg} - \frac{4B^2\log\left(\frac{1}{(a+bx)^2}\right)\log(g(a+bx))\log(c+dx)}{bg} - \frac{B^2\log(g(a}{}$$

$$= \frac{2AB\log^2(g(a+bx))}{bg} - \frac{4B^2\log\left(\frac{1}{(a+bx)^2}\right)\log(g(a+bx))\log(c+dx)}{bg} + \frac{B^2\log\Big(-\frac{a}{}}{}$$

$$= \frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2\left(\frac{1}{(a+bx)^2}\right)\log(c+dx)}{bg} - \frac{4B}{}$$

$$= \frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2\left(\frac{1}{(a+bx)^2}\right)\log(c+dx)}{bg} - \frac{4B}{}$$

Mathematica [A] time = 0.33, size = 257, normalized size = 1.95

$$\frac{A^2\log(a+bx)+2AB\log(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+4AB\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)-4AB\log(a+bx)\log\left(\frac{c}{d}+x\right)+4AB\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (-2*A*B*Log[a/b + x]^2 + A^2*Log[a + b*x] + 4*A*B*Log[a/b + x]*Log[a + b*x]
 - 4*A*B*Log[c/d + x]*Log[a + b*x] + 4*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(
-(b*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(c + d*x)^2)/(a + b*x)^2] - B^2*
Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(c + d*x)^2)/(a + b*x)^2]^2 + 4*A*
B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 4*B^2*Log[(e*(c + d*x)^2)/(a + b*
x)^2]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 8*B^2*PolyLog[3, (b*(c + d*
x))/(d*(a + b*x))])/(b*g)
```

fricas [F] time = 1.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^2\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\,AB\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)
)^2 + 2*A*B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))
+ A^2)/(b*g*x + a*g), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x, algorithm="giac
")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2/(b*g*x + a*g), x)
```

maple [F] time = 1.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2/(b*g*x+a*g),x)
```

```
[Out] int((B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2/(b*g*x+a*g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\,B^2\log(bx+a)\log(dx+c)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2\,ABbc\log(e)+4\left(B^2bdx+B^2bc\right)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x, algorithm="maxi
ma")
```

```
[Out] 4*B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - inte
grate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + 4*(B^2*b*d*x + B^2*b*c)*log(b
*x + a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x - 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) + 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x - 2*(2*B^2*b*d*x + (b*c + a*d)*B^2)*l
og(b*x + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x),
 x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)^2}{a\,g+b\,g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2/(a*g + b*g*x),x)
```

```
[Out] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2/(a*g + b*g*x), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{A^{2}}{a+bx}\, dx + \int \frac{B^{2} \log{\left(\frac{c^{2} e}{a^{2}+2abx+b^{2} x^{2}} + \frac{2cdex}{a^{2}+2abx+b^{2} x^{2}} + \frac{d^{2} e x^{2}}{a^{2}+2abx+b^{2} x^{2}} \right)}^{2}}{a+bx}\, dx + \int \frac{2AB \log{\left(\frac{c^{2} e}{a^{2}+2abx+b^{2} x^{2}} + \frac{2cdex}{a^{2}+2abx+b^{2} x^{2}} + \frac{d^{2} e x^{2}}{a^{2}+2abx+b^{2} x^{2}} \right)}}{a+bx}\, dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g),x)
```

```
[Out] (Integral(A**2/(a + b*x), x) + Integral(B**2*log(c**2*e/(a**2 + 2*a*b*x + b
**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*
a*b*x + b**2*x**2))**2/(a + b*x), x) + Integral(2*A*B*log(c**2*e/(a**2 + 2*
a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(
a**2 + 2*a*b*x + b**2*x**2))/(a + b*x), x))/g
```

3.215 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=157

$$-\frac{(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}+\frac{4AB(c+dx)}{g^2(a+bx)(bc-ad)}+\frac{4B^2(c+dx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{g^2(a+bx)(bc-ad)}-\frac{8B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] 4*A*B*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)-8*B^2*(d*x+c)/(-a*d+b*c)/g^2/(b*x+a)+4
*B^2*(d*x+c)*ln(e*(d*x+c)^2/(b*x+a)^2)/(-a*d+b*c)/g^2/(b*x+a)-(d*x+c)*(A+B*
ln(e*(d*x+c)^2/(b*x+a)^2))^2/(-a*d+b*c)/g^2/(b*x+a)
```

Rubi [C] time = 0.92, antiderivative size = 480, normalized size of antiderivative = 3.06, number of steps used = 26, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{8B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}+\frac{4Bd\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^2(bc-ad)}-4Bd\log(c+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-8*B^2)/(b*g^2*(a + b*x)) - (8*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
4*B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) + (8*B^2*d*Log[c + d*x])/(b*(b*
c - a*d)*g^2) - (8*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b
*(b*c - a*d)*g^2) + (4*B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (8*B^2*d
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) + (4*B*(A
 + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*g^2*(a + b*x)) + (4*B*d*Log[a +
b*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^2) - (4*B*d
*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^2)
 - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(b*g^2*(a + b*x)) - (8*B^2*d*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (8*B^2*d*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
```

```
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(-A-B\log\left(\frac{e}{(}\right.\right.}{(bc-ad)^2(a}\right.}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(4Bd)\int \frac{-A-B\log\left(\frac{e(c+dx}{(a+bx}\right.}{a+bx}}{(bc-ad)g^2}$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^2} - 4Bd\log$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^2} - 4Bd\log$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^2} - 4Bd\log$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} + \frac{4B\left(A+B\log\left(\frac{e(c+dx}{(a+bx}\right.\right.}{bg^2(a+bx)}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{8B^2d\log\left(-\frac{d(a+bx)}{bc-ad}\right)\mathrm{lo}}{b(bc-ad)g^2}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} -$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} -$$

Mathematica [C]   time = 0.46, size = 322, normalized size = 2.05

$$-\frac{\frac{4B\left(-(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-d(a+bx)\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+d(a+bx)\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-Bd(a+bx)\left(\log(a+bx)\left(\log(a\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^2,x]

[Out] -(((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (4*B*(2*B*(b*c - a*d + d*(a
 + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - (b*c - a*d)*(A + B*Log[(
e*(c + d*x)^2)/(a + b*x)^2]) - d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(c +
d*x)^2)/(a + b*x)^2]) + d*(a + b*x)*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)
```

```
/(a + b*x)^2]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a
+ b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

fricas [A] time = 0.74, size = 200, normalized size = 1.27

$$-\frac{\left(A^{2}-4\,AB+8\,B^{2}\right)bc-\left(A^{2}-4\,AB+8\,B^{2}\right)ad+\left(B^{2}bdx+B^{2}bc\right)\log\left(\frac{d^{2}ex^{2}+2\,cdex+c^{2}e}{b^{2}x^{2}+2\,abx+a^{2}}\right)^{2}+2\left(\left(AB-2\,B^{2}\right)bdx+\left(\right.\right.}{\left(b^{3}c-ab^{2}d\right)g^{2}x+\left(ab^{2}c-a^{2}bd\right)g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x, algorithm="fr
icas")
```

```
[Out] -((A^2 - 4*A*B + 8*B^2)*b*c - (A^2 - 4*A*B + 8*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(
(A*B - 2*B^2)*b*d*x + (A*B - 2*B^2)*b*c)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e
)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d
)*g^2)
```

giac [B] time = 1.28, size = 374, normalized size = 2.38

$$-\left(\frac{B^{2}d}{b^{2}cg^{2}-abdg^{2}}+\frac{B^{2}}{\left(bgx+ag\right)bg}\right)\log\left(\frac{\frac{b^{2}c^{2}g^{2}}{\left(bgx+ag\right)^{2}}-\frac{2\,abcdg^{2}}{\left(bgx+ag\right)^{2}}+\frac{a^{2}d^{2}g^{2}}{\left(bgx+ag\right)^{2}}+\frac{2\,bcdg}{bgx+ag}-\frac{2\,ad^{2}g}{bgx+ag}+d^{2}}{b^{2}}\right)^{2}-\frac{4\left(ABd-B^{2}d\right)}{b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x, algorithm="gi
ac")
```

```
[Out] -(B^2*d/(b^2*c*g^2 - a*b*d*g^2) + B^2/((b*g*x + a*g)*b*g))*log((b^2*c^2*g^2
/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g
)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)^2 - 4*(
A*B*d - B^2*d)*log(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x + a*g) + d)/(b^2*c*g^
2 - a*b*d*g^2) - 2*(A*B - B^2)*log((b^2*c^2*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d
*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*g/(b*g*x + a*g
) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)/((b*g*x + a*g)*b*g) - (A^2 - 2*A*B
+ 5*B^2)/((b*g*x + a*g)*b*g)
```

maple [B] time = 0.06, size = 452, normalized size = 2.88

$$\frac{4ABa\,d^{2}\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{\left(ad-bc\right)^{2}b\,g^{2}}-\frac{4ABcd\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{\left(ad-bc\right)^{2}g^{2}}+\frac{B^{2}d\ln\left(\frac{\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^{2}e}{b^{2}}\right)^{2}}{\left(ad-bc\right)b\,g^{2}}+\frac{4ABad}{\left(ad-bc\right)\left(bx+a\right)b\,g^{2}}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2/(b*g*x+a*g)^2,x)
```

```
[Out] -1/b/g^2*A^2/(b*x+a)-1/b/g^2/(b*x+a)*B^2*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)
^2/b^2*e)^2-8/b/g^2*B^2/(b*x+a)+4/b/g^2*B^2/(b*x+a)*ln((1/(b*x+a)*a*d-1/(b*
x+a)*b*c-d)^2/b^2*e)-4/b/g^2*B^2*d/(a*d-b*c)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*
c-d)^2/b^2*e)+1/b/g^2*B^2*d/(a*d-b*c)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/
b^2*e)^2-2/b/g^2*A*B/(b*x+a)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+4/
```

```
b/g^2*A*B/(a*d-b*c)/(b*x+a)*a*d-4/g^2*A*B/(a*d-b*c)/(b*x+a)*c+4/b/g^2*A*B*d
^2/(a*d-b*c)^2*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*a-4/g^2*A*B*d/(a*d-b*c)^2*
ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*c
```

maxima [B] time = 1.16, size = 573, normalized size = 3.65

$$4\left(\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}-\frac{d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,a}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x, algorithm="ma
xima")
```

```
[Out] 4*((1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(
d*x + c)/((b^2*c - a*b*d)*g^2))*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2
*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + ((b
*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d -
 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a)
)*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))*
B^2 - 2*A*B*(log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 +
 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^2*g^2*x + a*b*g^2) -
2/(b^2*g^2*x + a*b*g^2) - 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + 2*d*log(
d*x + c)/((b^2*c - a*b*d)*g^2)) - B^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^
2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))
^2/(b^2*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

mupad [B] time = 6.49, size = 227, normalized size = 1.45

$$\frac{\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\,\left(\frac{4\,B^2}{b^2\,d\,g^2}-\frac{2\,A\,B}{b^2\,d\,g^2}\right)}{\frac{x}{d}+\frac{a}{b\,d}}-\frac{A^2-4\,A\,B+8\,B^2}{x\,b^2\,g^2+a\,b\,g^2}-\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)^2\,\left(\frac{B^2}{b^2\,g^2\,\left(x+\frac{a}{b}\right)}-\frac{B^2\,d}{b\,g^2\,\left(a\,d-b\,c\right)}\right)+\frac{B\,d\,\mathrm{ata}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2/(a*g + b*g*x)^2,x)
```

```
[Out] (log((e*(c + d*x)^2)/(a + b*x)^2)*((4*B^2)/(b^2*d*g^2) - (2*A*B)/(b^2*d*g^2
)))/(x/d + a/(b*d)) - (A^2 + 8*B^2 - 4*A*B)/(b^2*g^2*x + a*b*g^2) - log((e*
(c + d*x)^2)/(a + b*x)^2)^2*(B^2/(b^2*g^2*(x + a/b)) - (B^2*d)/(b*g^2*(a*d
- b*c))) + (B*d*atan(((2*b*d*x + (b^2*c*g^2 + a*b*d*g^2)/(b*g^2))*1i)/(a*d
- b*c))*(A - 2*B)*8i)/(b*g^2*(a*d - b*c))
```

sympy [B] time = 3.80, size = 450, normalized size = 2.87

$$\frac{4Bd\left(A-2B\right)\log\left(x+\frac{4ABad^2+4ABbcd-8B^2ad^2-8B^2bcd-\frac{4Ba^2d^3(A-2B)}{ad-bc}+\frac{8Babcd^2(A-2B)}{ad-bc}-\frac{4Bb^2c^2d(A-2B)}{ad-bc}}{8ABbd^2-16B^2bd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{4Bd\left(A-2B\right)\log\left(x+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**2,x)
```

```
[Out] 4*B*d*(A - 2*B)*log(x + (4*A*B*a*d**2 + 4*A*B*b*c*d - 8*B**2*a*d**2 - 8*B**
2*b*c*d - 4*B*a**2*d**3*(A - 2*B)/(a*d - b*c) + 8*B*a*b*c*d**2*(A - 2*B)/(a
*d - b*c) - 4*B*b**2*c**2*d*(A - 2*B)/(a*d - b*c))/(8*A*B*b*d**2 - 16*B**2*
b*d**2))/(b*g**2*(a*d - b*c)) - 4*B*d*(A - 2*B)*log(x + (4*A*B*a*d**2 + 4*A
*B*b*c*d - 8*B**2*a*d**2 - 8*B**2*b*c*d + 4*B*a**2*d**3*(A - 2*B)/(a*d - b*
```

```
c) - 8*B*a*b*c*d**2*(A - 2*B)/(a*d - b*c) + 4*B*b**2*c**2*d*(A - 2*B)/(a*d
- b*c))/(8*A*B*b*d**2 - 16*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B + 4
*B**2)*log(e*(c + d*x)**2/(a + b*x)**2)/(a*b*g**2 + b**2*g**2*x) + (B**2*c
+ B**2*d*x)*log(e*(c + d*x)**2/(a + b*x)**2)**2/(a**2*d*g**2 - a*b*c*g**2 +
 a*b*d*g**2*x - b**2*c*g**2*x) + (-A**2 + 4*A*B - 8*B**2)/(a*b*g**2 + b**2*
g**2*x)
```

3.216 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=299

$$\frac{bB(c+dx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{g^3(a+bx)^2(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{g^3(a+bx)(bc-ad)^2}-$$

```
[Out] -4*A*B*d*(d*x+c)/(-a*d+b*c)^2/g^3/(b*x+a)+8*B^2*d*(d*x+c)/(-a*d+b*c)^2/g^3/
(b*x+a)-b*B^2*(d*x+c)^2/(-a*d+b*c)^2/g^3/(b*x+a)^2-4*B^2*d*(d*x+c)*ln(e*(d*
x+c)^2/(b*x+a)^2)/(-a*d+b*c)^2/g^3/(b*x+a)+b*B*(d*x+c)^2*(A+B*ln(e*(d*x+c)^
2/(b*x+a)^2))/(-a*d+b*c)^2/g^3/(b*x+a)^2+d*(d*x+c)*(A+B*ln(e*(d*x+c)^2/(b*x
+a)^2))^2/(-a*d+b*c)^2/g^3/(b*x+a)-1/2*b*(d*x+c)^2*(A+B*ln(e*(d*x+c)^2/(b*x
+a)^2))^2/(-a*d+b*c)^2/g^3/(b*x+a)^2
```

Rubi [C] time = 1.08, antiderivative size = 578, normalized size of antiderivative = 1.93, number of steps used = 30, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{4B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{4B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}-\frac{2Bd^2\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^3(bc-ad)^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -(B^2/(b*g^3*(a + b*x)^2)) + (6*B^2*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (6*B
^2*d^2*Log[a + b*x])/(b*(b*c - a*d)^2*g^3) - (2*B^2*d^2*Log[a + b*x]^2)/(b*
(b*c - a*d)^2*g^3) - (6*B^2*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) + (4*B^
2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*g^3)
 - (2*B^2*d^2*Log[c + d*x]^2)/(b*(b*c - a*d)^2*g^3) + (4*B^2*d^2*Log[a + b*
x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) + (B*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(b*g^3*(a + b*x)^2) - (2*B*d*(A + B*Log[(e*(c
+ d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^3*(a + b*x)) - (2*B*d^2*Log[a + b
*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^2*g^3) + (2*B*
d^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^2
*g^3) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(2*b*g^3*(a + b*x)^2) +
(4*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3)
+ (4*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(-A-B\log\left(\right.\right.}{(bc-ad)^2(a+}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(2Bd^2\right)\int \frac{-A-B\log\left(\frac{e(c+}{(a+}\right.}{a+bx}}{(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^3(a+bx)^2} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{2Bd^2\log(a+bx)\left(A\right.}{b(bc-a}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^3(a+bx)^2} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{2Bd^2\log(a+bx)\left(A\right.}{b(bc-a}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^3(a+bx)^2} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{2Bd^2\log(a+bx)\left(A\right.}{b(bc-a}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{6B^2d^2\log(c+d}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{6B^2d^2\log(c+d}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+}{b(bc-ad)^2g^}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+}{b(bc-ad)^2g^}$$

Mathematica [C] time = 0.46, size = 452, normalized size = 1.51

$$-\frac{\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2 - \frac{2B\left(-2d^2(a+bx)^2\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+2d^2(a+bx)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+(bc-ad)^2\left(B\log\left(\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -1/2*((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 - (2*B*(4*B*d*(a + b*x)*(b
*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*((b*c -
 a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2
*d^2*(a + b*x)^2*Log[c + d*x]) + (b*c - a*d)^2*(A + B*Log[(e*(c + d*x)^2)/(
```

```
a + b*x)^2]) + 2*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(c + d*x)^2)/(a +
 b*x)^2]) - 2*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(c + d*x)^2)/(a +
b*x)^2]) + 2*d^2*(a + b*x)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b
*x)^2]) - 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d
*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d^2*
(a + b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d
*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))))/(b*c - a*d)^2)/(b*g^3*(a +
 b*x)^2)
```

fricas [A] time = 1.04, size = 413, normalized size = 1.38

$$-\frac{(A^2-2\,AB+2\,B^2)b^2c^2-2\,(A^2-4\,AB+8\,B^2)abcd+(A^2-6\,AB+14\,B^2)a^2d^2-(B^2b^2d^2x^2+2\,B^2abd^2x-B^2}{2\,((b^5c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/2*((A^2 - 2*A*B + 2*B^2)*b^2*c^2 - 2*(A^2 - 4*A*B + 8*B^2)*a*b*c*d + (A^
2 - 6*A*B + 14*B^2)*a^2*d^2 - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b^2*
c^2 + 2*B^2*a*b*c*d)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x
 + a^2))^2 + 4*((A*B - 3*B^2)*b^2*c*d - (A*B - 3*B^2)*a*b*d^2)*x - 2*((A*B
- 3*B^2)*b^2*d^2*x^2 - (A*B - B^2)*b^2*c^2 + 2*(A*B - 2*B^2)*a*b*c*d - 2*(B
^2*b^2*c*d - (A*B - 2*B^2)*a*b*d^2)*x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/
(b^2*x^2 + 2*a*b*x + a^2)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2
+ 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*
b^2*c*d + a^4*b*d^2)*g^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{(bgx+ag)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2/(b*g*x + a*g)^3, x)
```

maple [B] time = 0.06, size = 664, normalized size = 2.22

$$\frac{2ABa\,d^3\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{(ad-bc)^3\,b\,g^3}-\frac{2ABc\,d^2\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{(ad-bc)^3\,g^3}+\frac{AB\,a^2d^2}{(ad-bc)^2\,(bx+a)^2\,b\,g^3}-\frac{2ABacd}{(ad-bc)^2\,(bx+a)^2\,g^3}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2/b/(b*x+a)^2/g^3*A^2-1/b/g^3*B^2/(b*x+a)^2+1/b/g^3*B^2/(b*x+a)^2*ln((1/
(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)-1/2/b/g^3*B^2/(b*x+a)^2*ln((1/(b*x+a)
*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)^2-6/b/g^3*B^2*d/(a*d-b*c)/(b*x+a)-3/b/g^3*B^
2*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*
e)+1/2/b/g^3*B^2*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln((1/(b*x+a)*a*d-1/(b*x+a
)*b*c-d)^2/b^2*e)^2+2/b/g^3*B^2*d/(a*d-b*c)/(b*x+a)*ln((1/(b*x+a)*a*d-1/(b*
```

```
x+a)*b*c-d)^2/b^2*e)-1/b/g^3*A*B/(b*x+a)^2*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-
d)^2/b^2*e)+1/b/g^3*A*B/(a*d-b*c)^2/(b*x+a)^2*a^2*d^2-2/g^3*A*B/(a*d-b*c)^2
/(b*x+a)^2*a*d*c+b/g^3*A*B/(a*d-b*c)^2/(b*x+a)^2*c^2+2/b/g^3*A*B/(a*d-b*c)^
2/(b*x+a)*d^2*a-2/g^3*A*B/(a*d-b*c)^2/(b*x+a)*d*c+2/b/g^3*A*B*d^3/(a*d-b*c)
^3*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)*a-2/g^3*A*B*d^2/(a*d-b*c)^3*ln(1/(b*x+
a)*a*d-1/(b*x+a)*b*c-d)*c
```

maxima [B] time = 1.48, size = 1001, normalized size = 3.35

$$-\left(\left(\left(\frac{2\,bdx - bc + 3\,ad}{\left(b^4c - ab^3d\right)g^3x^2 + 2\left(ab^3c - a^2b^2d\right)g^3x + \left(a^2b^2c - a^3bd\right)g^3} + \frac{2\,d^2\log\left(bx + a\right)}{\left(b^3c^2 - 2\,ab^2cd + a^2bd^2\right)g^3} - \frac{2\,d^2\log}{\left(b^3c^2 - 2\,ab^2c\right.}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x, algorithm="ma
xima")
```

```
[Out] -(((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^
2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*
a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d +
a^2*b*d^2)*g^3))*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x
^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + (b^2*c^2 - 8*a*b*c
*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2
*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^
2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*
x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log
(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g
^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g
^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 - A*B*((2*b*d*x - b*c + 3
*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2
*c - a^3*b*d)*g^3) + log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b
^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^3*g^3*x^2 + 2
*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^
2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3
)) - 1/2*B^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 +
 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))^2/(b^3*g^3*x^2 + 2*a*b^2
*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

mupad [B] time = 6.71, size = 504, normalized size = 1.69

$$\frac{\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)\left(\frac{2\,B^2\,x\,(a\,d-b\,c)}{b\,g^3\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}-\frac{A\,B}{b^2\,d\,g^3}+\frac{B^2\,d^2\left(\frac{2\,a^2\,d^2-3\,a\,b\,c\,d+b^2\,c^2}{b\,d^3}+\frac{a\,(a\,d-b\,c)}{b\,d^2}\right)}{b\,g^3\left(a^2\,d^2-2\,a\,b\,c\,d+b^2\,c^2\right)}\right)}{\frac{b\,x^2}{d}+\frac{a^2}{b\,d}+\frac{2\,a\,x}{d}}-\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)^2\left(\frac{B^2}{2\,b^2\,g^3\left(2\,a\,x\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2/(a*g + b*g*x)^3,x)
```

```
[Out] (log((e*(c + d*x)^2)/(a + b*x)^2)*((2*B^2*x*(a*d - b*c))/(b*g^3*(a^2*d^2 +
b^2*c^2 - 2*a*b*c*d)) - (A*B)/(b^2*d*g^3) + (B^2*d^2*((2*a^2*d^2 + b^2*c^2
- 3*a*b*c*d)/(b*d^3) + (a*(a*d - b*c))/(b*d^2)))/(b*g^3*(a^2*d^2 + b^2*c^2
- 2*a*b*c*d))))/((b*x^2)/d + a^2/(b*d) + (2*a*x)/d) - log((e*(c + d*x)^2)/(
a + b*x)^2)^2*(B^2/(2*b^2*g^3*(2*a*x + b*x^2 + a^2/b)) - (B^2*d^2)/(2*b*g^3
*(a^2*d^2 + b^2*c^2 - 2*a*b*c*d))) - ((A^2*a*d - A^2*b*c + 14*B^2*a*d - 2*B
^2*b*c - 6*A*B*a*d + 2*A*B*b*c)/(2*(a*d - b*c)) + (2*x*(3*B^2*b*d - A*B*b*d
))/(a*d - b*c))/(a^2*b*g^3 + b^3*g^3*x^2 + 2*a*b^2*g^3*x) - (B*d^2*atan((B*
d^2*(2*b*d*x - (b^3*c^2*g^3 - a^2*b*d^2*g^3)/(b*g^3*(a*d - b*c)))*(A - 3*B)
```

```
*2i)/((a*d - b*c)*(6*B^2*d^2 - 2*A*B*d^2)))*(A - 3*B)*4i)/(b*g^3*(a*d - b*c
)^2)
```

sympy [B] time = 6.65, size = 877, normalized size = 2.93

$$\frac{2Bd^{2}\left(A-3B\right)\log\left(x+\frac{2ABad^{3}+2ABbcd^{2}-6B^{2}ad^{3}-6B^{2}bcd^{2}-\frac{2Ba^{3}d^{5}(A-3B)}{(ad-bc)^{2}}+\frac{6Ba^{2}bcd^{4}(A-3B)}{(ad-bc)^{2}}-\frac{6Bab^{2}c^{2}d^{3}(A-3B)}{(ad-bc)^{2}}+\frac{2Bb^{3}c^{3}d^{2}(A-3B)}{(ad-bc)^{2}}}{4ABbd^{3}-12B^{2}bd^{3}}\right)}{bg^{3}\left(ad-bc\right)^{2}}-\frac{2Bd^{2}\left(A\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**3,x)
```

```
[Out] 2*B*d**2*(A - 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 - 6*B**2*a*d**3 -
 6*B**2*b*c*d**2 - 2*B*a**3*d**5*(A - 3*B)/(a*d - b*c)**2 + 6*B*a**2*b*c*d*
*4*(A - 3*B)/(a*d - b*c)**2 - 6*B*a*b**2*c**2*d**3*(A - 3*B)/(a*d - b*c)**2
 + 2*B*b**3*c**3*d**2*(A - 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 - 12*B**2*b*d
**3))/(b*g**3*(a*d - b*c)**2) - 2*B*d**2*(A - 3*B)*log(x + (2*A*B*a*d**3 +
2*A*B*b*c*d**2 - 6*B**2*a*d**3 - 6*B**2*b*c*d**2 + 2*B*a**3*d**5*(A - 3*B)/
(a*d - b*c)**2 - 6*B*a**2*b*c*d**4*(A - 3*B)/(a*d - b*c)**2 + 6*B*a*b**2*c*
*2*d**3*(A - 3*B)/(a*d - b*c)**2 - 2*B*b**3*c**3*d**2*(A - 3*B)/(a*d - b*c)
**2)/(4*A*B*b*d**3 - 12*B**2*b*d**3))/(b*g**3*(a*d - b*c)**2) + (2*B**2*a*c
*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(c + d*x)**2/(
a + b*x)**2)**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*g**3*
x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*g**3*
x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**3*x**
2) + (-A*B*a*d + A*B*b*c + 3*B**2*a*d - B**2*b*c + 2*B**2*b*d*x)*log(e*(c +
 d*x)**2/(a + b*x)**2)/(a**3*b*d*g**3 - a**2*b**2*c*g**3 + 2*a**2*b**2*d*g*
*3*x - 2*a*b**3*c*g**3*x + a*b**3*d*g**3*x**2 - b**4*c*g**3*x**2) + (-A**2*
a*d + A**2*b*c + 6*A*B*a*d - 2*A*B*b*c - 14*B**2*a*d + 2*B**2*b*c + x*(4*A*
B*b*d - 12*B**2*b*d))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + x**2*(2*a*b**
3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4*a*b**3*c*g**3))
```

3.217 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=407

$$\frac{4b^2B(c+dx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{4Bd^3\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{4Bd^2(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+\right.}{g^4(a+bx)(bc-ad)^3}$$

```
[Out] -8*B^2*d^2*(d*x+c)/(-a*d+b*c)^3/g^4/(b*x+a)+2*b*B^2*d*(d*x+c)^2/(-a*d+b*c)^
3/g^4/(b*x+a)^2-8/27*b^2*B^2*(d*x+c)^3/(-a*d+b*c)^3/g^4/(b*x+a)^3+4/3*B^2*d
^3*ln((d*x+c)/(b*x+a))^2/b/(-a*d+b*c)^3/g^4+4*B*d^2*(d*x+c)*(A+B*ln(e*(d*x+
c)^2/(b*x+a)^2))/(-a*d+b*c)^3/g^4/(b*x+a)-2*b*B*d*(d*x+c)^2*(A+B*ln(e*(d*x+
c)^2/(b*x+a)^2))/(-a*d+b*c)^3/g^4/(b*x+a)^2+4/9*b^2*B*(d*x+c)^3*(A+B*ln(e*(
d*x+c)^2/(b*x+a)^2))/(-a*d+b*c)^3/g^4/(b*x+a)^3-4/3*B*d^3*ln((d*x+c)/(b*x+a
))*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/b/(-a*d+b*c)^3/g^4-1/3*(A+B*ln(e*(d*x+c)
^2/(b*x+a)^2))^2/b/g^4/(b*x+a)^3
```

Rubi [C] time = 1.23, antiderivative size = 692, normalized size of antiderivative = 1.70, number of steps used = 34, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{8B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}+\frac{4Bd^3\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bg^4(bc-ad)^3}-\frac{4Bd^3\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-8*B^2)/(27*b*g^4*(a + b*x)^3) + (10*B^2*d)/(9*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (44*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (44*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (4*B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)
^3*g^4) + (44*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (4*
B^2*d^3*Log[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*Log[a + b*x]*L
og[(b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) + (4*B*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(9*b*g^4*(a + b*x)^3) - (2*B*d*(A + B*Log[(e*(
c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (4*B*d^2*(A
+ B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) +
(4*B*d^3*Log[a + b*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c -
 a*d)^3*g^4) - (4*B*d^3*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(3
*b*g^4*(a + b*x)^3) - (8*B^2*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(3*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(3*b*(b*c - a*d)^3*g^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^4} - \frac{bd\left(-A-B\log\left(\frac{e}{(}\right.\right.}{(bc-ad)^2(a+}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^4}\,dx}{3g^4} - \frac{\left(4Bd^3\right)\int \frac{-A-B\log\left(\frac{e(c+}{(a+b}\right.}{a+bx}}{3(bc-ad)^3g^4}$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{9bg^4(a+bx)^3} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{4Bd^2\left(A+B\log\left(\frac{e(}{(a}\right.\right.}{3b(bc-ad)^2g^4(a}$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{9bg^4(a+bx)^3} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{4Bd^2\left(A+B\log\left(\frac{e(}{(a}\right.\right.}{3b(bc-ad)^2g^4(a}$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{9bg^4(a+bx)^3} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{4Bd^2\left(A+B\log\left(\frac{e(}{(a}\right.\right.}{3b(bc-ad)^2g^4(a}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d}{9b(b}$$

Mathematica [C] time = 0.76, size = 598, normalized size = 1.47

$$-\frac{2B\left(-18d^3(a+bx)^3\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+18d^3(a+bx)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+18d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-6(bc-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -1/27*(9*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (2*B*(36*B*d^2*(a + b
*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9
*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b
*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3
 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a +
 b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 6*(b*c - a*d)^3*(A
 + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + 9*d*(b*c - a*d)^2*(a + b*x)*(A + B
*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + 18*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A +
 B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 18*d^3*(a + b*x)^3*Log[a + b*x]*(A +
 B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + 18*d^3*(a + b*x)^3*Log[c + d*x]*(A +
 B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) +
a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)
])))/(b*c - a*d)^3)/(b*g^4*(a + b*x)^3)
```

fricas [A] time = 0.67, size = 721, normalized size = 1.77

$$-\frac{\left(9\,A^2-12\,AB+8\,B^2\right)b^3c^3-27\left(A^2-2\,AB+2\,B^2\right)ab^2c^2d+27\left(A^2-4\,AB+8\,B^2\right)a^2bcd^2-\left(9\,A^2-66\,AB+1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/27*((9*A^2 - 12*A*B + 8*B^2)*b^3*c^3 - 27*(A^2 - 2*A*B + 2*B^2)*a*b^2*c^
2*d + 27*(A^2 - 4*A*B + 8*B^2)*a^2*b*c*d^2 - (9*A^2 - 66*A*B + 170*B^2)*a^3
*d^3 - 12*((3*A*B - 11*B^2)*b^3*c*d^2 - (3*A*B - 11*B^2)*a*b^2*d^3)*x^2 + 9
*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)
/(b^2*x^2 + 2*a*b*x + a^2))^2 + 6*((3*A*B - 5*B^2)*b^3*c^2*d - 18*(A*B - 3*
B^2)*a*b^2*c*d^2 + (15*A*B - 49*B^2)*a^2*b*d^3)*x + 6*((3*A*B - 11*B^2)*b^3
*d^3*x^3 + (3*A*B - 2*B^2)*b^3*c^3 - 9*(A*B - B^2)*a*b^2*c^2*d + 9*(A*B - 2
*B^2)*a^2*b*c*d^2 - 3*(2*B^2*b^3*c*d^2 - 3*(A*B - 3*B^2)*a*b^2*d^3)*x^2 + 3
*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 3*(A*B - 2*B^2)*a^2*b*d^3)*x)*log((d^
2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^7*c^3 - 3*a*b^
6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5
*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^
4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c
^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{\left(bgx+ag\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2/(b*g*x + a*g)^4, x)
```

maple [B] time = 0.07, size = 947, normalized size = 2.33

$$\frac{4AB\,a^3d^3}{9\,(ad-bc)^3\,(bx+a)^3\,b\,g^4}-\frac{4AB\,a^2c\,d^2}{3\,(ad-bc)^3\,(bx+a)^3\,g^4}+\frac{4ABab\,c^2d}{3\,(ad-bc)^3\,(bx+a)^3\,g^4}+\frac{4ABa\,d^4\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)}{3\,(ad-bc)^4\,b\,g^4}-\frac{}{9\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3/b/(b*x+a)^3/g^4*A^2-8/27/b/g^4*B^2/(b*x+a)^3+4/9/b/g^4*B^2/(b*x+a)^3*l
n((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)-1/3/b/g^4*B^2/(b*x+a)^3*ln((1/(b
*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)^2-10/9/b/g^4*B^2*d/(a*d-b*c)/(b*x+a)^2-
44/9/b/g^4*B^2*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(b*x+a)-22/9/b/g^4*d^3*B^2/(
a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*
c-d)^2/b^2*e)+1/3/b/g^4*d^3*B^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^
3)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)^2+2/3/b/g^4*B^2*d/(a*d-b*c)/
(b*x+a)^2*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+4/3/b/g^4*B^2*d^2/(a^
2*d^2-2*a*b*c*d+b^2*c^2)/(b*x+a)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e
)-2/3/b/g^4*A*B/(b*x+a)^3*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+4/9/b
/g^4*A*B*a^3*d^3/(a*d-b*c)^3/(b*x+a)^3-4/3/g^4*A*B*a^2*d^2/(a*d-b*c)^3/(b*x
+a)^3*c+4/3*b/g^4*A*B*a*d/(a*d-b*c)^3/(b*x+a)^3*c^2+2/3/b/g^4*A*B*a^2*d^3/(
a*d-b*c)^3/(b*x+a)^2-4/3/g^4*A*B*a*d^2/(a*d-b*c)^3/(b*x+a)^2*c+4/3/b/g^4*A*
B*a*d^3/(a*d-b*c)^3/(b*x+a)+4/3/b/g^4*A*B*a*d^4/(a*d-b*c)^4*ln(1/(b*x+a)*a*
d-1/(b*x+a)*b*c-d)-4/9*b^2/g^4*A*B*c^3/(a*d-b*c)^3/(b*x+a)^3+2/3*b/g^4*A*B*
c^2/(a*d-b*c)^3/(b*x+a)^2*d-4/3/g^4*A*B*c/(a*d-b*c)^3/(b*x+a)*d^2-4/3/g^4*A
*B*c*d^3/(a*d-b*c)^4*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)
```

maxima [B] time = 1.90, size = 1576, normalized size = 3.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x, algorithm="ma
xima")
```

```
[Out] 2/27*(3*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^
3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4
) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*
d^3)*g^4))*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2
*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - (4*b^3*c^3 - 27*a*b^2*c^
2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b
^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 -
 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*
b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 3
3*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^
3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g
^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g
^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*
b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*
x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*
b^2*d^3*g^4)*x))*B^2 + 2/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11
*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2
)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^
4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
 a^5*b*d^2)*g^4) - 3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b
^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*g^4*x^3 + 3
*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^
3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/
((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*lo
g(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2)
 + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^
```

```
2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4)
```

mupad [B] time = 9.08, size = 1069, normalized size = 2.63

$$\frac{\frac{9\,A^2\,a^2\,d^2-18\,A^2\,a\,b\,c\,d+9\,A^2\,b^2\,c^2-66\,A\,B\,a^2\,d^2+42\,A\,B\,a\,b\,c\,d-12\,A\,B\,b^2\,c^2+170\,B^2\,a^2\,d^2-46\,B^2\,a\,b\,c\,d+8\,B^2\,b^2\,c^2}{3\,(a\,d-b\,c)}+\frac{2\,x\,(-5\,c\,B^2\,b^2\,d+49\,a\,B^2\,b\,d^2+3}{a\,d-b\,c}}{x\,\left(27\,a^2\,b^3\,c\,g^4-27\,a^3\,b^2\,d\,g^4\right)-x^2\,\left(27\,a^2\,b^3\,d\,g^4-27\,a\,b^4\,c\,g^4\right)+x^3\,\left(9\,b^5\,c\,g^4-9\,a\,b^4\,d\,g^4\right)+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2/(a*g + b*g*x)^4,x)
```

```
[Out] ((9*A^2*a^2*d^2 + 9*A^2*b^2*c^2 + 170*B^2*a^2*d^2 + 8*B^2*b^2*c^2 - 66*A*B*
a^2*d^2 - 12*A*B*b^2*c^2 - 18*A^2*a*b*c*d - 46*B^2*a*b*c*d + 42*A*B*a*b*c*d
)/(3*(a*d - b*c)) + (2*x*(49*B^2*a*b*d^2 - 5*B^2*b^2*c*d - 15*A*B*a*b*d^2 +
 3*A*B*b^2*c*d))/(a*d - b*c) + (4*d*x^2*(11*B^2*b^2*d - 3*A*B*b^2*d))/(a*d
- b*c))/(x*(27*a^2*b^3*c*g^4 - 27*a^3*b^2*d*g^4) - x^2*(27*a^2*b^3*d*g^4 -
27*a*b^4*c*g^4) + x^3*(9*b^5*c*g^4 - 9*a*b^4*d*g^4) + 9*a^3*b^2*c*g^4 - 9*a
^4*b*d*g^4) - log((e*(c + d*x)^2)/(a + b*x)^2)^2*(B^2/(3*b^2*g^4*(3*a^2*x +
 a^3/b + b^2*x^3 + 3*a*b*x^2)) - (B^2*d^3)/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*
a*b^2*c^2*d - 3*a^2*b*c*d^2))) - (log((e*(c + d*x)^2)/(a + b*x)^2)*((2*A*B)
/(3*b^2*d*g^4) - (2*B^2*d^3*(a*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*b*d^3)
 + (2*a*(a*d - b*c))/(3*b*d^2)) + (2*(3*a^3*d^3 - b^3*c^3 + 4*a*b^2*c^2*d -
 6*a^2*b*c*d^2))/(3*b*d^4)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d -
3*a^2*b*c*d^2)) + (2*B^2*d^3*x^2*((2*(b^2*c - a*b*d))/(3*d^2) - (4*b*(a*d -
 b*c))/(3*d^2)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a^2*b*c*d^
2)) - (2*B^2*d^3*x*(b*((3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d)/(3*b*d^3) + (2*a*(
a*d - b*c))/(3*b*d^2)) + (2*(3*a^2*d^2 + b^2*c^2 - 4*a*b*c*d))/(3*d^3) + (4
*a*(a*d - b*c))/(3*d^2)))/(3*b*g^4*(a^3*d^3 - b^3*c^3 + 3*a*b^2*c^2*d - 3*a
^2*b*c*d^2))))/((3*a^2*x)/d + a^3/(b*d) + (b^2*x^3)/d + (3*a*b*x^2)/d) - (B
*d^3*atan((B*d^3*((b^4*c^3*g^4 + a^3*b*d^3*g^4 - a*b^3*c^2*d*g^4 - a^2*b^2*
c*d^2*g^4)/(b^3*c^2*g^4 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4) + 2*b*d*x)*(3*A
- 11*B)*(b^3*c^2*g^4 + a^2*b*d^2*g^4 - 2*a*b^2*c*d*g^4)*4i)/(b*g^4*(a*d - b
*c)^3*(44*B^2*d^3 - 12*A*B*d^3)))*(3*A - 11*B)*8i)/(9*b*g^4*(a*d - b*c)^3)
```

sympy [B] time = 35.55, size = 1561, normalized size = 3.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**4,x)
```

```
[Out] 4*B*d**3*(3*A - 11*B)*log(x + (12*A*B*a*d**4 + 12*A*B*b*c*d**3 - 44*B**2*a*
d**4 - 44*B**2*b*c*d**3 - 4*B*a**4*d**7*(3*A - 11*B)/(a*d - b*c)**3 + 16*B*
a**3*b*c*d**6*(3*A - 11*B)/(a*d - b*c)**3 - 24*B*a**2*b**2*c**2*d**5*(3*A -
 11*B)/(a*d - b*c)**3 + 16*B*a*b**3*c**3*d**4*(3*A - 11*B)/(a*d - b*c)**3 -
 4*B*b**4*c**4*d**3*(3*A - 11*B)/(a*d - b*c)**3)/(24*A*B*b*d**4 - 88*B**2*b
*d**4))/(9*b*g**4*(a*d - b*c)**3) - 4*B*d**3*(3*A - 11*B)*log(x + (12*A*B*a
*d**4 + 12*A*B*b*c*d**3 - 44*B**2*a*d**4 - 44*B**2*b*c*d**3 + 4*B*a**4*d**7
*(3*A - 11*B)/(a*d - b*c)**3 - 16*B*a**3*b*c*d**6*(3*A - 11*B)/(a*d - b*c)*
*3 + 24*B*a**2*b**2*c**2*d**5*(3*A - 11*B)/(a*d - b*c)**3 - 16*B*a*b**3*c**
3*d**4*(3*A - 11*B)/(a*d - b*c)**3 + 4*B*b**4*c**4*d**3*(3*A - 11*B)/(a*d -
 b*c)**3)/(24*A*B*b*d**4 - 88*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3*
B**2*a**2*c*d**2 + 3*B**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**3
*x**2 + B**2*b**2*c**3 + B**2*b**2*d**3*x**3)*log(e*(c + d*x)**2/(a + b*x)*
*2)**2/(3*a**6*d**3*g**4 - 9*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9*
a**4*b**2*c**2*d*g**4 - 27*a**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4*
```

```
x**2 - 3*a**3*b**3*c**3*g**4 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c*
d**2*g**4*x**2 + 3*a**3*b**3*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27*
a**2*b**4*c**2*d*g**4*x**2 - 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*g
**4*x**2 + 9*a*b**5*c**2*d*g**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a**
2*d**2 + 12*A*B*a*b*c*d - 6*A*B*b**2*c**2 + 22*B**2*a**2*d**2 - 14*B**2*a*b
*c*d + 30*B**2*a*b*d**2*x + 4*B**2*b**2*c**2 - 6*B**2*b**2*c*d*x + 12*B**2*
b**2*d**2*x**2)*log(e*(c + d*x)**2/(a + b*x)**2)/(9*a**5*b*d**2*g**4 - 18*a
**4*b**2*c*d*g**4 + 27*a**4*b**2*d**2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*a
**3*b**3*c*d*g**4*x + 27*a**3*b**3*d**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4*
x - 54*a**2*b**4*c*d*g**4*x**2 + 9*a**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c**
2*g**4*x**2 - 18*a*b**5*c*d*g**4*x**3 + 9*b**6*c**2*g**4*x**3) - (9*A**2*a*
*2*d**2 - 18*A**2*a*b*c*d + 9*A**2*b**2*c**2 - 66*A*B*a**2*d**2 + 42*A*B*a*
b*c*d - 12*A*B*b**2*c**2 + 170*B**2*a**2*d**2 - 46*B**2*a*b*c*d + 8*B**2*b*
*2*c**2 + x**2*(-36*A*B*b**2*d**2 + 132*B**2*b**2*d**2) + x*(-90*A*B*a*b*d*
*2 + 18*A*B*b**2*c*d + 294*B**2*a*b*d**2 - 30*B**2*b**2*c*d))/(27*a**5*b*d*
*2*g**4 - 54*a**4*b**2*c*d*g**4 + 27*a**3*b**3*c**2*g**4 + x**3*(27*a**2*b*
*4*d**2*g**4 - 54*a*b**5*c*d*g**4 + 27*b**6*c**2*g**4) + x**2*(81*a**3*b**3
*d**2*g**4 - 162*a**2*b**4*c*d*g**4 + 81*a*b**5*c**2*g**4) + x*(81*a**4*b**
2*d**2*g**4 - 162*a**3*b**3*c*d*g**4 + 81*a**2*b**4*c**2*g**4))
```

3.218 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=501

$$\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^4}-\frac{4b^2Bd(c+dx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^4}+\frac{Bd^4\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^5(bc-ad)^4}$$

```
[Out] 8*B^2*d^3*(d*x+c)/(-a*d+b*c)^4/g^5/(b*x+a)-3*b*B^2*d^2*(d*x+c)^2/(-a*d+b*c)
^4/g^5/(b*x+a)^2+8/9*b^2*B^2*d*(d*x+c)^3/(-a*d+b*c)^4/g^5/(b*x+a)^3-1/8*b^3
*B^2*(d*x+c)^4/(-a*d+b*c)^4/g^5/(b*x+a)^4-B^2*d^4*ln((d*x+c)/(b*x+a))^2/b/(
-a*d+b*c)^4/g^5-4*B*d^3*(d*x+c)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(-a*d+b*c)^
4/g^5/(b*x+a)+3*b*B*d^2*(d*x+c)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(-a*d+b*c
)^4/g^5/(b*x+a)^2-4/3*b^2*B*d*(d*x+c)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(-a
*d+b*c)^4/g^5/(b*x+a)^3+1/4*b^3*B*(d*x+c)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))
/(-a*d+b*c)^4/g^5/(b*x+a)^4+B*d^4*ln((d*x+c)/(b*x+a))*(A+B*ln(e*(d*x+c)^2/(
b*x+a)^2))/b/(-a*d+b*c)^4/g^5-1/4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/b/g^5/(
b*x+a)^4
```

Rubi [C] time = 1.43, antiderivative size = 758, normalized size of antiderivative = 1.51, number of steps used = 38, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^5(bc-ad)^4}+\frac{2B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^5(bc-ad)^4}-\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^5(bc-ad)^4}+\frac{Bd^4\log(c+d}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(8*b*g^5*(a + b*x)^4) + (7*B^2*d)/(18*b*(b*c - a*d)*g^5*(a + b*x)^3) -
 (13*B^2*d^2)/(12*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(6*b*(b*c
 - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(6*b*(b*c - a*d)^4*g^5
) - (B^2*d^4*Log[a + b*x]^2)/(b*(b*c - a*d)^4*g^5) - (25*B^2*d^4*Log[c + d*
x])/(6*b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[c + d*x])/(b*(b*c - a*d)^4*g^5) - (B^2*d^4*Log[c + d*x]^2)/(b*(b*c - a*
d)^4*g^5) + (2*B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c
 - a*d)^4*g^5) + (B*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(4*b*g^5*(a +
 b*x)^4) - (B*d*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c - a*d)*
g^5*(a + b*x)^3) + (B*d^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(2*b*(b
*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^
2]))/(b*(b*c - a*d)^3*g^5*(a + b*x)) - (B*d^4*Log[a + b*x]*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x]*(A +
B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*
(c + d*x)^2)/(a + b*x)^2])^2/(4*b*g^5*(a + b*x)^4) + (2*B^2*d^4*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^4*g^5)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int\frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^5(c+dx)}\,dx}{bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^5}-\frac{bd\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right.\right.}{(bc-ad)^2(a+bx)^4}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4}+\frac{B\int\frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^5}\,dx}{g^5}+\frac{\left(Bd^4\right)\int\frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{a+bx}\,dx}{(bc-ad)^4g^5}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4bg^5(a+bx)^4}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4bg^5(a+bx)^4}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4bg^5(a+bx)^4}-\frac{Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4}+\frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3}-\frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2}+\frac{}{6b(bc-}$$

Mathematica [C] time = 0.87, size = 762, normalized size = 1.52

$$\frac{B\left(-72d^4(a+bx)^4\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+72d^4(a+bx)^4\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+72d^3(a+bx)^3(ad-bc)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+36d^2(a+bx)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] (-18*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (B*(144*B*d^3*(a + b*x)^3
*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 36*B*d
^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b
*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 8*B*d*(a + b*x)*(2*(
b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2
+ 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 3*B*(3
*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a +
b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x
] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 18*(b*c - a*d)^4*(A + B*Log[(e*(c +
d*x)^2)/(a + b*x)^2]) + 24*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(c +
d*x)^2)/(a + b*x)^2]) + 36*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(c +
 d*x)^2)/(a + b*x)^2]) + 72*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]) - 72*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]) + 72*d^4*(a + b*x)^4*Log[c + d*x]*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]) - 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) + 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c -
a*d)^4)/(72*b*g^5*(a + b*x)^4)
```

fricas [**B**] time = 0.82, size = 1088, normalized size = 2.17

$$-\frac{9\left(2A^2-2AB+B^2\right)b^4c^4-8\left(9A^2-12AB+8B^2\right)ab^3c^3d+108\left(A^2-2AB+2B^2\right)a^2b^2c^2d^2-72\left(A^2-4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/72*(9*(2*A^2 - 2*A*B + B^2)*b^4*c^4 - 8*(9*A^2 - 12*A*B + 8*B^2)*a*b^3*c
^3*d + 108*(A^2 - 2*A*B + 2*B^2)*a^2*b^2*c^2*d^2 - 72*(A^2 - 4*A*B + 8*B^2)
*a^3*b*c*d^3 + (18*A^2 - 150*A*B + 415*B^2)*a^4*d^4 + 12*((6*A*B - 25*B^2)*
b^4*c*d^3 - (6*A*B - 25*B^2)*a*b^3*d^4)*x^3 - 6*((6*A*B - 13*B^2)*b^4*c^2*d
^2 - 16*(3*A*B - 11*B^2)*a*b^3*c*d^3 + (42*A*B - 163*B^2)*a^2*b^2*d^4)*x^2
- 18*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 + 4*B^2
*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*
B^2*a^3*b*c*d^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a
^2))^2 + 4*((6*A*B - 7*B^2)*b^4*c^3*d - 12*(3*A*B - 5*B^2)*a*b^3*c^2*d^2 +
108*(A*B - 3*B^2)*a^2*b^2*c*d^3 - (78*A*B - 271*B^2)*a^3*b*d^4)*x - 6*((6*A
*B - 25*B^2)*b^4*d^4*x^4 - 3*(2*A*B - B^2)*b^4*c^4 + 8*(3*A*B - 2*B^2)*a*b^
3*c^3*d - 36*(A*B - B^2)*a^2*b^2*c^2*d^2 + 24*(A*B - 2*B^2)*a^3*b*c*d^3 - 4
*(3*B^2*b^4*c*d^3 - 2*(3*A*B - 11*B^2)*a*b^3*d^4)*x^3 + 6*(B^2*b^4*c^2*d^2
- 8*B^2*a*b^3*c*d^3 + 6*(A*B - 3*B^2)*a^2*b^2*d^4)*x^2 - 4*(B^2*b^4*c^3*d -
 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 - 6*(A*B - 2*B^2)*a^3*b*d^4)*x)
*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^9*c^4
- 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^
4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 +
a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2
 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*
d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4
 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

giac [**A**] time = 2.22, size = 868, normalized size = 1.73

$$\frac{1}{4}\left(\frac{B^2d^4}{b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+a^4bd^4g^5}-\frac{B^2}{\left(bgx+ag\right)^4bg}\right)\log\left(\frac{\frac{b^2c^2g^2}{\left(bgx+ag\right)^2}-\frac{2\,abcdg^2}{\left(bgx+ag\right)^2}+}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x, algorithm="gi
ac")
```

```
[Out] 1/4*(B^2*d^4/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a
^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) - B^2/((b*g*x + a*g)^4*b*g))*log((b^2*c^2
*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x +
 a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)^2 -
 1/12*(12*B^2*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a
^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 6*B^2*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a^2*
d^2*g)*(b*g*x + a*g)^2*b*g^2) + 4*B^2*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2)
 + 3*(2*A*B*b^3*g^3 + B^2*b^3*g^3)/((b*g*x + a*g)^4*b^4*g^4))*log((b^2*c^2*
g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x +
a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2) + 1/
6*(6*A*B*d^4 - 19*B^2*d^4)*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g) -
 d)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*
d^3*g^5 + a^4*b*d^4*g^5) - 1/6*(6*A*B*d^3 - 19*B^2*d^3)/((b^3*c^3*g^3 - 3*a
*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*(b*g*x + a*g)*b*g) + 1/12
*(6*A*B*b*d^2 - 7*B^2*b*d^2)/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(b*g*x
+ a*g)^2*b^2*g^2) - 1/18*(6*A*B*b^2*d*g - B^2*b^2*d*g)/((b*g*x + a*g)^3*(b*
c - a*d)*b^3*g^3) - 1/8*(2*A^2*b^3*g^3 + 2*A*B*b^3*g^3 + B^2*b^3*g^3)/((b*g
*x + a*g)^4*b^4*g^4)
```

maple [B] time = 0.07, size = 1285, normalized size = 2.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2/(b*g*x+a*g)^5,x)
```

```
[Out] 1/4/b/g^5*B^2/(b*x+a)^4*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+1/b/g^5
*d^3*B^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(b*x+a)*ln((1/(b*x+a
)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+1/3/b/g^5*B^2*d/(a*d-b*c)/(b*x+a)^3*ln((1/(
b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+1/2/b/g^5*B^2*d^2/(a^2*d^2-2*a*b*c*d+b
^2*c^2)/(b*x+a)^2*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)+1/4*b^3/g^5*A
*B*c^4/(a*d-b*c)^4/(b*x+a)^4-1/g^5*A*B*c*d^4/(a*d-b*c)^5*ln(1/(b*x+a)*a*d-1
/(b*x+a)*b*c-d)-1/g^5*A*B*c/(a*d-b*c)^4/(b*x+a)*d^3-1/4/b/g^5*B^2/(b*x+a)^4
*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)^2-1/3*b^2/g^5*A*B*c^3/(a*d-b*c
)^4/(b*x+a)^3*d-1/g^5*A*B*a^3*d^3/(a*d-b*c)^4/(b*x+a)^4*c-1/g^5*A*B*a*d^3/(
a*d-b*c)^4/(b*x+a)^2*c-1/g^5*A*B*a^2*d^3/(a*d-b*c)^4/(b*x+a)^3*c+1/b/g^5*A*
B*a*d^5/(a*d-b*c)^5*ln(1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)+1/b/g^5*A*B*a*d^4/(a*
d-b*c)^4/(b*x+a)+1/2/b/g^5*A*B*a^2*d^4/(a*d-b*c)^4/(b*x+a)^2+1/4/b/g^5*A*B*
a^4*d^4/(a*d-b*c)^4/(b*x+a)^4+1/3/b/g^5*A*B*a^3*d^4/(a*d-b*c)^4/(b*x+a)^3+1
/2*b/g^5*A*B*c^2/(a*d-b*c)^4/(b*x+a)^2*d^2-1/4/b/(b*x+a)^4/g^5*A^2-1/8/b/g^
5*B^2/(b*x+a)^4-1/2/b/g^5*A*B/(b*x+a)^4*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^
2/b^2*e)-7/18/b/g^5*B^2*d/(a*d-b*c)/(b*x+a)^3-13/12/b/g^5*B^2*d^2/(a^2*d^2-
2*a*b*c*d+b^2*c^2)/(b*x+a)^2-25/6/b/g^5*d^3*B^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*
b^2*c^2*d-b^3*c^3)/(b*x+a)-25/12/b/g^5*d^4*B^2/(a^4*d^4-4*a^3*b*c*d^3+6*a^2
*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^
2*e)+1/4/b/g^5*d^4*B^2/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3
*d+b^4*c^4)*ln((1/(b*x+a)*a*d-1/(b*x+a)*b*c-d)^2/b^2*e)^2+3/2*b/g^5*A*B*a^2
*d^2/(a*d-b*c)^4/(b*x+a)^4*c^2-b^2/g^5*A*B*a*d/(a*d-b*c)^4/(b*x+a)^4*c^3+b/
g^5*A*B*a*d^2/(a*d-b*c)^4/(b*x+a)^3*c^2
```

maxima [B] time = 2.51, size = 2278, normalized size = 4.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x, algorithm="ma
xima")
```

```
[Out] -1/72*(6*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 2
5*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2
+ 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^
3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3
)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^
3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d
^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g
^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4
*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*
c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(d^2*e*x^
2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(
b^2*x^2 + 2*a*b*x + a^2)) + (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d
^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(1
3*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)
^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
+ a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2
*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*
d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*
a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^
4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*
log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*
b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*
b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g
^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 - 1/12*A*B*((12*b^3*d^3*x^3 -
 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 -
7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^
3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 -
 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3
- 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3
 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 -
3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 6*log(d^2*e*x^2/(b^2*
x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2
 + 2*a*b*x + a^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a
^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d +
 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c
)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d
^4)*g^5)) - 1/4*B^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^
2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))^2/(b^5*g^5*x^4 +
4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^
2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^
4*b*g^5)
```

mupad [B] time = 12.11, size = 1882, normalized size = 3.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2/(a*g + b*g*x)^5,x)
```

```
[Out] (log((e*(c + d*x)^2)/(a + b*x)^2)*((B^2*d^4*(a*(a*((4*a^2*d^2 + b^2*c^2 - 5
*a*b*c*d)/(6*b*d^3) + (a*(a*d - b*c))/(2*b*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5
*a*b^2*c^2*d - 10*a^2*b*c*d^2)/(6*b*d^4)) + (4*a^4*d^4 + b^4*c^4 + 10*a^2*b
```

```
^2*c^2*d^2 - 5*a*b^3*c^3*d - 10*a^3*b*c*d^3)/(2*b*d^5)))/(2*b*g^5*(a^4*d^4
+ b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) - (A*B)/(2*
b^2*d*g^5) + (B^2*d^4*x^2*(b*(b*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*b*d^3
) + (a*(a*d - b*c))/(2*b*d^2)) + (4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(3*d^3)
+ (a*(a*d - b*c))/d^2) - a*((b^2*c - a*b*d)/(2*d^2) - (b*(a*d - b*c))/d^2)
+ (b^3*c^2 + 4*a^2*b*d^2 - 5*a*b^2*c*d)/(2*d^3)))/(2*b*g^5*(a^4*d^4 + b^4*c
^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)) - (B^2*d^4*x^3*(b*
((b^2*c - a*b*d)/(2*d^2) - (b*(a*d - b*c))/d^2) + (b^3*c - a*b^2*d)/(2*d^2)
))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*
b*c*d^3)) + (B^2*d^4*x*(b*(a*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*b*d^3) +
 (a*(a*d - b*c))/(2*b*d^2)) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2
*b*c*d^2)/(6*b*d^4)) + a*(b*((4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(6*b*d^3) +
(a*(a*d - b*c))/(2*b*d^2)) + (4*a^2*d^2 + b^2*c^2 - 5*a*b*c*d)/(3*d^3) + (a
*(a*d - b*c))/d^2) + (6*a^3*d^3 - b^3*c^3 + 5*a*b^2*c^2*d - 10*a^2*b*c*d^2)
/(2*d^4)))/(2*b*g^5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d
- 4*a^3*b*c*d^3))))/((4*a^3*x)/d + a^4/(b*d) + (b^3*x^4)/d + (6*a^2*b*x^2)/
d + (4*a*b^2*x^3)/d) - log((e*(c + d*x)^2)/(a + b*x)^2)^2*(B^2/(4*b^2*g^5*(
4*a^3*x + a^4/b + b^3*x^4 + 6*a^2*b*x^2 + 4*a*b^2*x^3)) - (B^2*d^4)/(4*b*g^
5*(a^4*d^4 + b^4*c^4 + 6*a^2*b^2*c^2*d^2 - 4*a*b^3*c^3*d - 4*a^3*b*c*d^3)))
 - ((18*A^2*a^3*d^3 - 18*A^2*b^3*c^3 + 415*B^2*a^3*d^3 - 9*B^2*b^3*c^3 - 15
0*A*B*a^3*d^3 + 18*A*B*b^3*c^3 + 54*A^2*a*b^2*c^2*d - 54*A^2*a^2*b*c*d^2 +
55*B^2*a*b^2*c^2*d - 161*B^2*a^2*b*c*d^2 - 78*A*B*a*b^2*c^2*d + 138*A*B*a^2
*b*c*d^2)/(12*(a*d - b*c)) + (x^2*(163*B^2*a*b^2*d^3 - 13*B^2*b^3*c*d^2 - 4
2*A*B*a*b^2*d^3 + 6*A*B*b^3*c*d^2))/(2*(a*d - b*c)) + (x*(271*B^2*a^2*b*d^3
 + 7*B^2*b^3*c^2*d - 53*B^2*a*b^2*c*d^2 - 78*A*B*a^2*b*d^3 - 6*A*B*b^3*c^2*
d + 30*A*B*a*b^2*c*d^2))/(3*(a*d - b*c)) + (d*x^3*(25*B^2*b^3*d^2 - 6*A*B*b
^3*d^2))/(a*d - b*c))/(x*(24*a^3*b^4*c^2*g^5 + 24*a^5*b^2*d^2*g^5 - 48*a^4*
b^3*c*d*g^5) + x^3*(24*a*b^6*c^2*g^5 + 24*a^3*b^4*d^2*g^5 - 48*a^2*b^5*c*d*
g^5) + x^4*(6*b^7*c^2*g^5 + 6*a^2*b^5*d^2*g^5 - 12*a*b^6*c*d*g^5) + x^2*(36
*a^2*b^5*c^2*g^5 + 36*a^4*b^3*d^2*g^5 - 72*a^3*b^4*c*d*g^5) + 6*a^6*b*d^2*g
^5 + 6*a^4*b^3*c^2*g^5 - 12*a^5*b^2*c*d*g^5) + (B*d^4*atan((B*d^4*(6*A - 25
*B)*(6*b^5*c^4*g^5 - 6*a^4*b*d^4*g^5 - 12*a*b^4*c^3*d*g^5 + 12*a^3*b^2*c*d^
3*g^5)*1i)/(6*b*g^5*(a*d - b*c)^4*(25*B^2*d^4 - 6*A*B*d^4)) + (B*d^5*x*(6*A
 - 25*B)*(b^4*c^3*g^5 - a^3*b*d^3*g^5 - 3*a*b^3*c^2*d*g^5 + 3*a^2*b^2*c*d^2
*g^5)*2i)/(g^5*(a*d - b*c)^4*(25*B^2*d^4 - 6*A*B*d^4)))*(6*A - 25*B)*1i)/(3
*b*g^5*(a*d - b*c)^4)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

3.219 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$

Optimal. Leaf size=37

$$\text{Int}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-1), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x] + b^2*g^2*D
efer[Int][x^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx+\left(b^2g^2\right)\int\end{aligned}$$

Mathematica [A] time = 0.16, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

fricas [A] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((d^2*e*x^2 + 2*c*d*e*
x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)) + A), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^{2}}{B \log\left(\frac{(dx+c)^{2} e}{(bx+a)^{2}}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

maple [A] time = 0.80, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^{2}}{B \ln\left(\frac{(dx+c)^{2} e}{(bx+a)^{2}}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^{2}}{B \log\left(\frac{(dx+c)^{2} e}{(bx+a)^{2}}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(a\,g + b\,g\,x\right)^{2}}{A + B\,\ln\left(\frac{e\,(c+d\,x)^{2}}{(a+b\,x)^{2}}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)),x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$g^{2} \left(\int \frac{a^{2}}{A + B \log\left(\frac{c^{2} e}{a^{2}+2abx+b^{2}x^{2}} + \frac{2cdex}{a^{2}+2abx+b^{2}x^{2}} + \frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x^{2}}\right)}\, dx + \int \frac{b^{2}x^{2}}{A + B \log\left(\frac{c^{2} e}{a^{2}+2abx+b^{2}x^{2}} + \frac{2cdex}{a^{2}+2abx+b^{2}x^{2}} + \right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] g**2*(Integral(a**2/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*
e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2)
)), x) + Integral(b**2*x**2/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2)
+ 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b*
*2*x**2))), x) + Integral(2*a*b*x/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*
x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*
x + b**2*x**2))), x))
```

3.220 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{ag+bgx}{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-1), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx &= \int\left(\frac{ag}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\right)dx\\ &= (ag)\int\frac{1}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx+(bg)\int\frac{x}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.12, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

fricas [A] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fricas
")
```

```
[Out] integral((b*g*x + a*g)/(B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*
a*b*x + a^2)) + A), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B \log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

maple [**A**] time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B \ln\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{B \log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxima
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g + b\,g\,x}{A + B\,\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)),x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$g\left(\int \frac{a}{A + B\log\left(\frac{c^2 e}{a^2+2abx+b^2x^2} + \frac{2cdex}{a^2+2abx+b^2x^2} + \frac{d^2ex^2}{a^2+2abx+b^2x^2}\right)}\,dx + \int \frac{bx}{A + B\log\left(\frac{c^2 e}{a^2+2abx+b^2x^2} + \frac{2cdex}{a^2+2abx+b^2x^2} +\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] g*(Integral(a/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a
**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x)
 + Integral(b*x/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/
(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))),
x))
```

3.221 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$

Optimal. Leaf size=37

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.07, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

fricas [A] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((d^2*e*x^2 + 2*c*d*e*x
+ c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

maple [A] time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa+Abx+Ba\log\left(\frac{c^{2}e}{a^{2}+2abx+b^{2}x^{2}}+\frac{2cdex}{a^{2}+2abx+b^{2}x^{2}}+\frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x^{2}}\right)+Bbx\log\left(\frac{c^{2}e}{a^{2}+2abx+b^{2}x^{2}}+\frac{2cdex}{a^{2}+2abx+b^{2}x^{2}}+\frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x^{2}}\right)}\,dx}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Integral(1/(A*a + A*b*x + B*a*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c
*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x*
*2)) + B*b*x*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*
a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x)/g
```

3.222 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$

Optimal. Leaf size=91

$$-\frac{e^{-\frac{A}{2B}}(c+dx)\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{2Bg^2(a+bx)(bc-ad)\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}$$

```
[Out] -1/2*(d*x+c)*Ei(1/2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/B)/B/(-a*d+b*c)/exp(1/2
*A/B)/g^2/(b*x+a)/(e*(d*x+c)^2/(b*x+a)^2)^(1/2)
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ab^2g^2x^2+2\,Aabg^2x+Aa^2g^2+\left(Bb^2g^2x^2+2\,Babg^2x+Ba^2g^2\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*
B*a*b*g^2*x + B*a^2*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a
*b*x + a^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

maple [F] time = 0.87, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\ln\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)^{2}\,\left(A+B\,\ln\left(\frac{e\,(c+d\,x)^{2}}{(a+b\,x)^{2}}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{2}+2Aabx+Ab^{2}x^{2}+Ba^{2}\log\left(\frac{c^{2}e}{a^{2}+2abx+b^{2}x^{2}}+\frac{2cdex}{a^{2}+2abx+b^{2}x^{2}}+\frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x^{2}}\right)+2Babx\log\left(\frac{c^{2}e}{a^{2}+2abx+b^{2}x^{2}}+\frac{2cdex}{a^{2}+2abx+b^{2}x^{2}}+\frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x^{2}}\right)+Bb^{2}x^{2}\,\mathrm{lo}}}{g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Integral(1/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(c**2*e/(a**2 + 2*
a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(
a**2 + 2*a*b*x + b**2*x**2)) + 2*B*a*b*x*log(c**2*e/(a**2 + 2*a*b*x + b**2*
x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*
x + b**2*x**2)) + B*b**2*x**2*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c
*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x*
*2))), x)/g**2
```

3.223 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$

Optimal. Leaf size=151

$$\frac{de^{-\frac{A}{2B}}(c+dx)\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{2Bg^3(a+bx)(bc-ad)^2\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}-\frac{be^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{B}\right)}{2Beg^3(bc-ad)^2}$$

```
[Out] -1/2*b*Ei((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/B)/B/(-a*d+b*c)^2/e/exp(A/B)/g^3+
1/2*d*(d*x+c)*Ei(1/2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/B)/B/(-a*d+b*c)^2/exp(
1/2*A/B)/g^3/(b*x+a)/(e*(d*x+c)^2/(b*x+a)^2)^(1/2)
```

Rubi [F] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.08, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

fricas [F] time = 1.93, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ab^3g^3x^3+3\,Aab^2g^3x^2+3\,Aa^2bg^3x+Aa^3g^3+\left(Bb^3g^3x^3+3\,Bab^2g^3x^2+3\,Ba^2bg^3x+Ba^3g^3\right)\log\left(\frac{d^2ex}{b^2x}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3
 + (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((d
^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{\left(dx+c\right)^{2}e}{\left(bx+a\right)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

maple [F] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\ln\left(\frac{\left(dx+c\right)^{2}e}{\left(bx+a\right)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{\left(dx+c\right)^{2}e}{\left(bx+a\right)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{Aa^{3}+3Aa^{2}bx+3Aab^{2}x^{2}+Ab^{3}x^{3}+Ba^{3}\log\left(\frac{c^{2}e}{a^{2}+2abx+b^{2}x^{2}}+\frac{2cdex}{a^{2}+2abx+b^{2}x^{2}}+\frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x^{2}}\right)+3Ba^{2}bx\log\left(\frac{c^{2}e}{a^{2}+2abx+b^{2}x^{2}}+\frac{2cdex}{a^{2}+2abx+b^{2}x^{2}}+\frac{d^{2}ex^{2}}{a^{2}+2abx+b^{2}x}\right.}}{g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Integral(1/(A*a**3 + 3*A*a**2*b*x + 3*A*a*b**2*x**2 + A*b**3*x**3 + B*a**3*
log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*
x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2)) + 3*B*a**2*b*x*log(c**2*e
/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d*
*2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2)) + 3*B*a*b**2*x**2*log(c**2*e/(a**2
+ 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x*
*2/(a**2 + 2*a*b*x + b**2*x**2)) + B*b**3*x**3*log(c**2*e/(a**2 + 2*a*b*x +
 b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 +
2*a*b*x + b**2*x**2))), x)/g**3
```

3.224 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\mathrm{Int}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-2), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x] + b^2*g^2
*Defer[Int][x^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right.}\right.\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx +\end{aligned}$$

Mathematica [A] time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

fricas [A] time = 0.77, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2g^2x^2+2\,abg^2x+a^2g^2}{B^2\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\,AB\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((d^2*e*x^2 + 2*c*d*
e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*A*B*log((d^2*e*x^2 + 2*c*d*e*
x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^2}{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

maple [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{\left(bgx + ag\right)^2}{\left(B\ln\left(\frac{(dx+c)^2e}{(bx+a)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^3dg^2x^4 + a^3cg^2 + \left(b^3cg^2 + 3\,ab^2dg^2\right)x^3 + 3\left(ab^2cg^2 + a^2bdg^2\right)x^2 + \left(3\,a^2bcg^2 + a^3dg^2\right)x}{2\left(2\,(bc-ad)B^2\log\left(bx+a\right) - 2\,(bc-ad)B^2\log\left(dx+c\right) - (bc-ad)AB - \left(bc\log(e) - ad\log(e)\right)B^2\right)} + \int \frac{}{2\,(2\,(b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] -1/2*(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^
2*c*g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/(2*(b*c - a*d)*
B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*
log(e) - a*d*log(e))*B^2) + integrate(1/2*(4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2
+ a^3*d*g^2 + 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*
g^2)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) -
(b*c - a*d)*A*B - (b*c*log(e) - a*d*log(e))*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(a\,g+b\,g\,x\right)}^2}{{\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)^2/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2, x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{-a^3cg^2 - a^3dg^2x - 3a^2bcg^2x - 3a^2bdg^2x^2 - 3ab^2cg^2x^2 - 3ab^2dg^2x^3 - b^3cg^2x^3 - b^3dg^2x^4}{2ABad - 2ABbc + \left(2B^2ad - 2B^2bc\right)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} + \frac{g^2\left(\int \frac{}{A+B\log\left(\frac{c^2}{a^2+2abx}\right.}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] (-a**3*c*g**2 - a**3*d*g**2*x - 3*a**2*b*c*g**2*x - 3*a**2*b*d*g**2*x**2 -
3*a*b**2*c*g**2*x**2 - 3*a*b**2*d*g**2*x**3 - b**3*c*g**2*x**3 - b**3*d*g**
2*x**4)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B**2*b*c)*log(e*(c + d*x)*
*2/(a + b*x)**2)) + g**2*(Integral(a**3*d/(A + B*log(c**2*e/(a**2 + 2*a*b*x
 + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2
+ 2*a*b*x + b**2*x**2))), x) + Integral(3*a**2*b*c/(A + B*log(c**2*e/(a**2
+ 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x*
*2/(a**2 + 2*a*b*x + b**2*x**2))), x) + Integral(3*b**3*c*x**2/(A + B*log(c
**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2)
 + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x) + Integral(4*b**3*d*x**3/
(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x
+ b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x) + Integral(6*
a*b**2*c*x/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2
 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x) +
Integral(9*a*b**2*d*x**2/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2
*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*
x**2))), x) + Integral(6*a**2*b*d*x/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**
2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*
b*x + b**2*x**2))), x))/(2*B*(a*d - b*c))
```

3.225 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Int}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-2), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\,AB\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 +
2*a*b*x + a^2))^2 + 2*A*B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*
a*b*x + a^2)) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{\left(B\log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

maple [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{bgx + ag}{\left(B\ln\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int((b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{b^2dgx^3 + a^2cg + \left(b^2cg + 2\,abdg\right)x^2 + \left(2\,abcg + a^2dg\right)x}{2\left(2\,(bc-ad)B^2\log\left(bx+a\right) - 2\,(bc-ad)B^2\log\left(dx+c\right) - (bc-ad)AB - \left(bc\log(e) - ad\log(e)\right)B^2\right)} + \int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*
d*g)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) -
(b*c - a*d)*A*B - (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(3*b^2*d*g
*x^2 + 2*a*b*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/(2*(b*c - a*d)*B^2*
log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*log(
e) - a*d*log(e))*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{a\,g + b\,g\,x}{\left(A + B\,\ln\left(\frac{e\,(c+d\,x)^2}{(a+b\,x)^2}\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*g + b*g*x)/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2,x)
```

```
[Out] int((a*g + b*g*x)/(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{-a^2cg - a^2dgx - 2abcgx - 2abdgx^2 - b^2cgx^2 - b^2dgx^3}{2ABad - 2ABbc + \left(2B^2ad - 2B^2bc\right)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} + \frac{g\left(\int \frac{a^2d}{A+B\log\left(\frac{c^2e}{a^2+2abx+b^2x^2} + \frac{2cdex}{a^2+2abx+b^2x^2} + \frac{d^2ex^2}{a^2+2abx+b^2x^2}\right)}\,dx + \int\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] (-a**2*c*g - a**2*d*g*x - 2*a*b*c*g*x - 2*a*b*d*g*x**2 - b**2*c*g*x**2 - b*
*2*d*g*x**3)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B**2*b*c)*log(e*(c +
d*x)**2/(a + b*x)**2)) + g*(Integral(a**2*d/(A + B*log(c**2*e/(a**2 + 2*a*b
*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**
2 + 2*a*b*x + b**2*x**2))), x) + Integral(2*a*b*c/(A + B*log(c**2*e/(a**2 +
 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**
2/(a**2 + 2*a*b*x + b**2*x**2))), x) + Integral(2*b**2*c*x/(A + B*log(c**2*
e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d
**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x) + Integral(3*b**2*d*x**2/(A +
 B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b*
*2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x) + Integral(4*a*b*
d*x/(A + B*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*
b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x))/(2*B*(a*
d - b*c))
```

3.226 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\text{Int}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x]
```

fricas [A] time = 0.81, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d^2*e*x^2 + 2*
c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log
((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2), x)
```

maple [**A**] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)\left(B\ln\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$d\int \frac{1}{2\left(2\left(bcg-adg\right)B^2\log\left(bx+a\right)-2\left(bcg-adg\right)B^2\log\left(dx+c\right)-\left(bcg-adg\right)AB-\left(bcg\log(e)-adg\log(e)\right)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] d*integrate(1/2/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B^2
*log(d*x + c) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2), x
) - 1/2*(d*x + c)/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B
^2*log(d*x + c) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{-c-dx}{2ABadg-2ABbcg+\left(2B^2adg-2B^2bcg\right)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{d\int \frac{1}{A+B\log\left(\frac{c^2e}{a^2+2abx+b^2x^2}+\frac{2cdex}{a^2+2abx+b^2x^2}+\frac{d^2ex^2}{a^2+2abx+b^2x^2}\right)}\,dx}{2Bg\left(ad-bc\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] (-c - d*x)/(2*A*B*a*d*g - 2*A*B*b*c*g + (2*B**2*a*d*g - 2*B**2*b*c*g)*log(e
*(c + d*x)**2/(a + b*x)**2)) + d*Integral(1/(A + B*log(c**2*e/(a**2 + 2*a*b
*x + b**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**
2 + 2*a*b*x + b**2*x**2))), x)/(2*B*g*(a*d - b*c))
```

3.227 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=147

$$\frac{c+dx}{2Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}-\frac{e^{-\frac{A}{2B}}(c+dx)\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{4B^2g^2(a+bx)(bc-ad)\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}$$

```
[Out] 1/2*(d*x+c)/B/(-a*d+b*c)/g^2/(b*x+a)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))-1/4*(d
*x+c)*Ei(1/2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/B)/B^2/(-a*d+b*c)/exp(1/2*A/B)
/g^2/(b*x+a)/(e*(d*x+c)^2/(b*x+a)^2)^(1/2)
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.19, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x
]
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2b^2g^2x^2+2A^2abg^2x+A^2a^2g^2+\left(B^2b^2g^2x^2+2B^2abg^2x+B^2a^2g^2\right)\log\left(\frac{d^2ex^2+2cdex+c^2e}{b^2x^2+2abx+a^2}\right)^2+2\left(ABb^2g\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*
x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b
^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2
*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{2}\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2), x)
```

maple [F] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^{2}\left(B\ln\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{}{2\Big(\big(abcg^{2} - a^{2}dg^{2}\big)AB + \big(abcg^{2}\log(e) - a^{2}dg^{2}\log(e)\big)B^{2} + \Big(\big(b^{2}cg^{2} - abdg^{2}\big)AB + \big(b^{2}cg^{2}\log(e) - abdg^{2}\log(e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
maxima")
```

```
[Out] 1/2*(d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2*
log(e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2*
log(e))*B^2)*x - 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)
*B^2)*log(b*x + a) + 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*
g^2)*B^2)*log(d*x + c)) + integrate(1/2/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2 +
 (B^2*b^2*g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b*g
^2)*x - 2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a) +
2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(a\,g+b\,g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{-c-dx}{2ABa^2dg^2-2ABabcg^2+2ABabdg^2x-2ABb^2cg^2x+\left(2B^2a^2dg^2-2B^2abcg^2+2B^2abdg^2x-2B^2b^2cg^2x\right)\log\left(\frac{e(c}{(a}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] (-c - d*x)/(2*A*B*a**2*d*g**2 - 2*A*B*a*b*c*g**2 + 2*A*B*a*b*d*g**2*x - 2*A
*B*b**2*c*g**2*x + (2*B**2*a**2*d*g**2 - 2*B**2*a*b*c*g**2 + 2*B**2*a*b*d*g
**2*x - 2*B**2*b**2*c*g**2*x)*log(e*(c + d*x)**2/(a + b*x)**2)) + Integral(
1/(A*a**2 + 2*A*a*b*x + A*b**2*x**2 + B*a**2*log(c**2*e/(a**2 + 2*a*b*x + b
**2*x**2) + 2*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*
a*b*x + b**2*x**2)) + 2*B*a*b*x*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2
*c*d*e*x/(a**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*
x**2)) + B*b**2*x**2*log(c**2*e/(a**2 + 2*a*b*x + b**2*x**2) + 2*c*d*e*x/(a
**2 + 2*a*b*x + b**2*x**2) + d**2*e*x**2/(a**2 + 2*a*b*x + b**2*x**2))), x)
/(2*B*g**2)
```

3.228 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=206

$$\frac{de^{-\frac{A}{2B}}(c+dx)\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{4B^2g^3(a+bx)(bc-ad)^2\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}-\frac{be^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{B}\right)}{2B^2eg^3(bc-ad)^2}+\frac{c+dx}{2Bg^3(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}$$

```
[Out] -1/2*b*Ei((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/B)/B^2/(-a*d+b*c)^2/e/exp(A/B)/g^
3+1/2*(d*x+c)/B/(-a*d+b*c)/g^3/(b*x+a)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))+1/
4*d*(d*x+c)*Ei(1/2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/B)/B^2/(-a*d+b*c)^2/exp(
1/2*A/B)/g^3/(b*x+a)/(e*(d*x+c)^2/(b*x+a)^2)^(1/2)
```

Rubi [F] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x
]
```

fricas [F] time = 0.71, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{}{A^2b^3g^3x^3+3\,A^2ab^2g^3x^2+3\,A^2a^2bg^3x+A^2a^3g^3+\left(B^2b^3g^3x^3+3\,B^2ab^2g^3x^2+3\,B^2a^2bg^3x+B^2a^3g\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2
*a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2
*a^3*g^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2
+ 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^
3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^3 \left(B \log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2), x)
```

maple [**F**] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx + ag\right)^3 \left(B \ln\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(B*ln((d*x+c)^2/(b*x+a)^2*e)+A)^2,x)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{}{2\Big(\big(a^2bcg^3 - a^3dg^3\big)AB + \big(a^2bcg^3\log(e) - a^3dg^3\log(e)\big)B^2 + \Big(\big(b^3cg^3 - ab^2dg^3\big)AB + \big(b^3cg^3\log(e) - ab^2dg^3\log(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
maxima")
```

```
[Out] 1/2*(d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d*
g^3*log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b^
2*d*g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g^
3*log(e) - a^2*b*d*g^3*log(e))*B^2)*x - 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^
2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*lo
g(b*x + a) + 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b*
d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate(-1/
2*(b*d*x + 2*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e)
 - a*b^3*d*g^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*
g^3*log(e) - a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B +
 (a*b^3*c*g^3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 -
 a^3*b*d*g^3)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x - 2*
((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^
2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*
log(b*x + a) + 2*((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*
b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 -
 a^4*d*g^3)*B^2)*log(d*x + c)), x)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)^3\,{\left(A+B\,\ln\left(\frac{e\,{\left(c+d\,x\right)}^2}{{\left(a+b\,x\right)}^2}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2),x)
```

```
[Out] int(1/((a*g + b*g*x)^3*(A + B*log((e*(c + d*x)^2)/(a + b*x)^2))^2), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

3.229 $\int \frac{1}{(ag+bgx)^2\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)}\,dx$

Optimal. Leaf size=96

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

```
[Out] exp(A/B/n)*(d*x+c)*(e*(b*x+a)^n/((d*x+c)^n))^(1/n)*Ei((-A-B*ln(e*(b*x+a)^n/
((d*x+c)^n)))/B/n)/B/(-a*d+b*c)/g^2/n/(b*x+a)
```

Rubi [F] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Mathematica [F] time = 0.06, size = 0, normalized size = 0.00

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

fricas [A] time = 0.75, size = 62, normalized size = 0.65

$$\frac{e^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)}{(Bbc-Bad)g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
fricas")
```

```
[Out] e^((B*log(e) + A)/(B*n))*log_integral((d*x + c)*e^(-(B*log(e) + A)/(B*n))/(
b*x + a))/((B*b*c - B*a*d)*g^2*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^2\left(B\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

maple [F] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(a\,g+b\,g\,x\right)^{2}\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^{n}}{(c+d\,x)^{n}}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))),x)
```

```
[Out] int(1/((a*g + b*g*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

3.230 $\int (f+gx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=355

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+\frac{Bgx(bc-ad)\,(a^3d^3g^3-a^2bd^2g^2(5df}{}$$

```
[Out] 1/5*B*(-a*d+b*c)*g*(a^3*d^3*g^3-a^2*b*d^2*g^2*(-c*g+5*d*f)+a*b^2*d*g*(c^2*g
^2-5*c*d*f*g+10*d^2*f^2)-b^3*(-c^3*g^3+5*c^2*d*f*g^2-10*c*d^2*f^2*g+10*d^3*
f^3))*x/b^4/d^4-1/10*B*(-a*d+b*c)*g^2*(a^2*d^2*g^2-a*b*d*g*(-c*g+5*d*f)+b^2
*(c^2*g^2-5*c*d*f*g+10*d^2*f^2))*x^2/b^3/d^3-1/15*B*(-a*d+b*c)*g^3*(-a*d*g-
b*c*g+5*b*d*f)*x^3/b^2/d^2-1/20*B*(-a*d+b*c)*g^4*x^4/b/d-1/5*B*(-a*g+b*f)^5
*ln(b*x+a)/b^5/g+1/5*(g*x+f)^5*(A+B*ln(e*(b*x+a)/(d*x+c)))/g+1/5*B*(-c*g+d*
f)^5*ln(d*x+c)/d^5/g
```

Rubi **[A]** time = 0.56, antiderivative size = 339, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2525, 12, 72}

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+\frac{Bgx\,(-10a^2b^2d^4f^2g+5a^3bd^4fg^2-a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*g*(10*a*b^3*d^4*f^3 - 10*a^2*b^2*d^4*f^2*g + 5*a^3*b*d^4*f*g^2 - a^4*d^4
*g^3 - b^4*c*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*d*f*g^2 - c^3*g^3))*x)/(5
*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*d*g*(5*d*f - c*g) + b^2*(
10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*x^2)/(10*b^3*d^3) - (B*(b*c - a*d)*g^3*(
5*b*d*f - b*c*g - a*d*g)*x^3)/(15*b^2*d^2) - (B*(b*c - a*d)*g^4*x^4)/(20*b*
d) - (B*(b*f - a*g)^5*Log[a + b*x])/(5*b^5*g) + ((f + g*x)^5*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(5*g) + (B*(d*f - c*g)^5*Log[c + d*x])/(5*d^5*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5g} - \frac{B\int \frac{(bc-ad)(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5g} - \frac{(B(bc-ad))\int \frac{(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5g} - \frac{(B(bc-ad))\int \left(\frac{g^2\left(-a^3d^3g^3+a^2bd^2g^2(\right.}{}\right.}{}$$

$$= \frac{B(bc-ad)g\left(a^3d^3g^3-a^2bd^2g^2(5df-cg)+ab^2dg\left(10d^2f^2-5cdfg\right.\right.}{5b^4d^4}$$

Mathematica [A] time = 0.59, size = 279, normalized size = 0.79

$$\frac{\frac{Bg^2x(ad-bc)\left(-12a^3d^3g^3+6a^2bd^2g^2(-2cg+10df+dgx)-2ab^2dg\left(6c^2g^2-3cdg(10f+gx)+d^2\left(60f^2+15fgx+2g^2x^2\right)\right)+b^3\left(-12c^3g^3+6c^2dg^2(10f+gx)-2c\right.\right.}{12b^4d^4}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] ((B*(-(b*c) + a*d)*g^2*x*(-12*a^3*d^3*g^3 + 6*a^2*b*d^2*g^2*(10*d*f - 2*c*g
 + d*g*x) - 2*a*b^2*d*g*(6*c^2*g^2 - 3*c*d*g*(10*f + g*x) + d^2*(60*f^2 + 1
5*f*g*x + 2*g^2*x^2)) + b^3*(-12*c^3*g^3 + 6*c^2*d*g^2*(10*f + g*x) - 2*c*d
^2*g*(60*f^2 + 15*f*g*x + 2*g^2*x^2) + d^3*(120*f^3 + 60*f^2*g*x + 20*f*g^2
*x^2 + 3*g^3*x^3))))/(12*b^4*d^4) - (B*(b*f - a*g)^5*Log[a + b*x])/b^5 + (f
 + g*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*(d*f - c*g)^5*Log[c + d
*x])/d^5)/(5*g)
```

fricas [A] time = 1.60, size = 636, normalized size = 1.79

$$\frac{12\,Ab^5d^5g^4x^5+3\left(20\,Ab^5d^5fg^3-\left(Bb^5cd^4-Bab^4d^5\right)g^4\right)x^4+4\left(30\,Ab^5d^5f^2g^2-5\left(Bb^5cd^4-Bab^4d^5\right)fg^3+\left(B\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 3*(20*A*b^5*d^5*f*g^3 - (B*b^5*c*d^4 - B*a*b^4
*d^5)*g^4)*x^4 + 4*(30*A*b^5*d^5*f^2*g^2 - 5*(B*b^5*c*d^4 - B*a*b^4*d^5)*f*
g^3 + (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*g^4)*x^3 + 6*(20*A*b^5*d^5*f^3*g - 10
*(B*b^5*c*d^4 - B*a*b^4*d^5)*f^2*g^2 + 5*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f*
g^3 - (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g^4)*x^2 + 12*(5*A*b^5*d^5*f^4 - 10*(
B*b^5*c*d^4 - B*a*b^4*d^5)*f^3*g + 10*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f^2*g
^2 - 5*(B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*f*g^3 + (B*b^5*c^4*d - B*a^4*b*d^5)*
g^4)*x + 12*(5*B*a*b^4*d^5*f^4 - 10*B*a^2*b^3*d^5*f^3*g + 10*B*a^3*b^2*d^5*
f^2*g^2 - 5*B*a^4*b*d^5*f*g^3 + B*a^5*d^5*g^4)*log(b*x + a) - 12*(5*B*b^5*c
*d^4*f^4 - 10*B*b^5*c^2*d^3*f^3*g + 10*B*b^5*c^3*d^2*f^2*g^2 - 5*B*b^5*c^4*
d*f*g^3 + B*b^5*c^5*g^4)*log(d*x + c) + 12*(B*b^5*d^5*g^4*x^5 + 5*B*b^5*d^5
*f*g^3*x^4 + 10*B*b^5*d^5*f^2*g^2*x^3 + 10*B*b^5*d^5*f^3*g*x^2 + 5*B*b^5*d^
5*f^4*x)*log((b*e*x + a*e)/(d*x + c)))/(b^5*d^5)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.29, size = 14719, normalized size = 41.46

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^4*(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] result too large to display
```

maxima [A] time = 0.82, size = 593, normalized size = 1.67

$$\frac{1}{5}Ag^4x^5+Afg^3x^4+2\,Af^2g^2x^3+2\,Af^3gx^2+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)Bf^4+2\Big(x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/5*A*g^4*x^5 + A*f*g^3*x^4 + 2*A*f^2*g^2*x^3 + 2*A*f^3*g*x^2 + (x*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*f^4 +
 2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*l
og(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*f^3*g + (2*x^3*log(b*e*x/(d*x + c)
 + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2
*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f^2*g^2 + 1/6*(
6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4
*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d
^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*f*g^3 + 1/60*(12*x^5*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x +
 c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^
3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*
g^4 + A*f^4*x
```

mupad [B] time = 5.34, size = 1392, normalized size = 3.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^4*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] x^2*((20*A*a*c*f*g^3 + 20*A*b*d*f^3*g + 30*A*a*d*f^2*g^2 + 30*A*b*c*f^2*g^2
 + 10*B*a*d*f^2*g^2 - 10*B*b*c*f^2*g^2)/(10*b*d) + ((5*a*d + 5*b*c)*((((5*A
*a*d*g^4 + 5*A*b*c*g^4 + B*a*d*g^4 - B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d) -
(A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*g^4 +
20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 5*B*a*d*f*g^3 - 5*B*b*c*f*g^3 + 30*A*b*d*
f^2*g^2)/(5*b*d) + (A*a*c*g^4)/(b*d)))/(10*b*d) - (a*c*((5*A*a*d*g^4 + 5*A*
b*c*g^4 + B*a*d*g^4 - B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d +
 5*b*c))/(5*b*d)))/(2*b*d)) + x^4*((5*A*a*d*g^4 + 5*A*b*c*g^4 + B*a*d*g^4 -
 B*b*c*g^4 + 20*A*b*d*f*g^3)/(20*b*d) - (A*g^4*(5*a*d + 5*b*c))/(20*b*d)) +
 log((e*(a + b*x))/(c + d*x))*((B*g^4*x^5)/5 + B*f^4*x + 2*B*f^2*g^2*x^3 +
2*B*f^3*g*x^2 + B*f*g^3*x^4) + x*((5*A*b*d*f^4 + 20*A*a*d*f^3*g + 20*A*b*c*
f^3*g + 10*B*a*d*f^3*g - 10*B*b*c*f^3*g + 30*A*a*c*f^2*g^2)/(5*b*d) - ((5*a
*d + 5*b*c)*((20*A*a*c*f*g^3 + 20*A*b*d*f^3*g + 30*A*a*d*f^2*g^2 + 30*A*b*c
*f^2*g^2 + 10*B*a*d*f^2*g^2 - 10*B*b*c*f^2*g^2)/(5*b*d) + ((5*a*d + 5*b*c)*
((((5*A*a*d*g^4 + 5*A*b*c*g^4 + B*a*d*g^4 - B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*
```

```
b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c
*g^4 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 5*B*a*d*f*g^3 - 5*B*b*c*f*g^3 + 30
*A*b*d*f^2*g^2)/(5*b*d) + (A*a*c*g^4)/(b*d)))/(5*b*d) - (a*c*((5*A*a*d*g^4
+ 5*A*b*c*g^4 + B*a*d*g^4 - B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5
*a*d + 5*b*c))/(5*b*d)))/(b*d)))/(5*b*d) + (a*c*((((5*A*a*d*g^4 + 5*A*b*c*g
^4 + B*a*d*g^4 - B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d + 5*b*
c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 + 20*
A*b*c*f*g^3 + 5*B*a*d*f*g^3 - 5*B*b*c*f*g^3 + 30*A*b*d*f^2*g^2)/(5*b*d) + (
A*a*c*g^4)/(b*d)))/(b*d)) - x^3*((((5*A*a*d*g^4 + 5*A*b*c*g^4 + B*a*d*g^4 -
 B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*
a*d + 5*b*c))/(15*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 5
*B*a*d*f*g^3 - 5*B*b*c*f*g^3 + 30*A*b*d*f^2*g^2)/(15*b*d) + (A*a*c*g^4)/(3*
b*d)) + (A*g^4*x^5)/5 + (log(a + b*x)*((B*a^5*g^4)/5 + B*a*b^4*f^4 - 2*B*a^
2*b^3*f^3*g + 2*B*a^3*b^2*f^2*g^2 - B*a^4*b*f*g^3))/b^5 - (log(c + d*x)*(B*
c^5*g^4 + 5*B*c*d^4*f^4 - 10*B*c^2*d^3*f^3*g + 10*B*c^3*d^2*f^2*g^2 - 5*B*c
^4*d*f*g^3))/(5*d^5)
```

sympy [**B**] time = 26.35, size = 1436, normalized size = 4.05

$$\frac{Ag^4x^5}{5} + \frac{Ba\left(a^4g^4 - 5a^3bfg^3 + 10a^2b^2f^2g^2 - 10ab^3f^3g + 5b^4f^4\right)\log\left(x + \frac{Ba^5cd^4g^4 - 5Ba^4bcd^4fg^3 + 10Ba^3b^2cd^4f^2g^2 - 10Ba}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g**4*x**5/5 + B*a*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g**2 -
 10*a*b**3*f**3*g + 5*b**4*f**4)*log(x + (B*a**5*c*d**4*g**4 - 5*B*a**4*b*c
*d**4*f*g**3 + 10*B*a**3*b**2*c*d**4*f**2*g**2 - 10*B*a**2*b**3*c*d**4*f**3
*g + B*a**2*d**5*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g**2 - 10
*a*b**3*f**3*g + 5*b**4*f**4)/b + B*a*b**4*c**5*g**4 - 5*B*a*b**4*c**4*d*f*
g**3 + 10*B*a*b**4*c**3*d**2*f**2*g**2 - 10*B*a*b**4*c**2*d**3*f**3*g + 10*
B*a*b**4*c*d**4*f**4 - B*a*c*d**4*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b*
*2*f**2*g**2 - 10*a*b**3*f**3*g + 5*b**4*f**4))/(B*a**5*d**5*g**4 - 5*B*a**
4*b*d**5*f*g**3 + 10*B*a**3*b**2*d**5*f**2*g**2 - 10*B*a**2*b**3*d**5*f**3*
g + 5*B*a*b**4*d**5*f**4 + B*b**5*c**5*g**4 - 5*B*b**5*c**4*d*f*g**3 + 10*B
*b**5*c**3*d**2*f**2*g**2 - 10*B*b**5*c**2*d**3*f**3*g + 5*B*b**5*c*d**4*f*
*4))/(5*b**5) - B*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d**2*f**2*g**2 -
 10*c*d**3*f**3*g + 5*d**4*f**4)*log(x + (B*a**5*c*d**4*g**4 - 5*B*a**4*b*c
*d**4*f*g**3 + 10*B*a**3*b**2*c*d**4*f**2*g**2 - 10*B*a**2*b**3*c*d**4*f**3
*g + B*a*b**4*c**5*g**4 - 5*B*a*b**4*c**4*d*f*g**3 + 10*B*a*b**4*c**3*d**2*
f**2*g**2 - 10*B*a*b**4*c**2*d**3*f**3*g + 10*B*a*b**4*c*d**4*f**4 - B*a*b*
*4*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d**2*f**2*g**2 - 10*c*d**3*f**3
*g + 5*d**4*f**4) + B*b**5*c**2*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d**2
*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4)/d)/(B*a**5*d**5*g**4 - 5*B*a**
4*b*d**5*f*g**3 + 10*B*a**3*b**2*d**5*f**2*g**2 - 10*B*a**2*b**3*d**5*f**3*
g + 5*B*a*b**4*d**5*f**4 + B*b**5*c**5*g**4 - 5*B*b**5*c**4*d*f*g**3 + 10*B
*b**5*c**3*d**2*f**2*g**2 - 10*B*b**5*c**2*d**3*f**3*g + 5*B*b**5*c*d**4*f*
*4))/(5*d**5) + x**4*(A*f*g**3 + B*a*g**4/(20*b) - B*c*g**4/(20*d)) + x**3*
(2*A*f**2*g**2 - B*a**2*g**4/(15*b**2) + B*a*f*g**3/(3*b) + B*c**2*g**4/(15
*d**2) - B*c*f*g**3/(3*d)) + x**2*(2*A*f**3*g + B*a**3*g**4/(10*b**3) - B*a
**2*f*g**3/(2*b**2) + B*a*f**2*g**2/b - B*c**3*g**4/(10*d**3) + B*c**2*f*g*
*3/(2*d**2) - B*c*f**2*g**2/d) + x*(A*f**4 - B*a**4*g**4/(5*b**4) + B*a**3*
f*g**3/b**3 - 2*B*a**2*f**2*g**2/b**2 + 2*B*a*f**3*g/b + B*c**4*g**4/(5*d**
4) - B*c**3*f*g**3/d**3 + 2*B*c**2*f**2*g**2/d**2 - 2*B*c*f**3*g/d) + (B*f*
*4*x + 2*B*f**3*g*x**2 + 2*B*f**2*g**2*x**3 + B*f*g**3*x**4 + B*g**4*x**5/5
)*log(e*(a + b*x)/(c + d*x))
```

3.231 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=227

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g}-B(bf-$$

```
[Out] -1/4*B*(-a*d+b*c)*g*(a^2*d^2*g^2-a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*
g+6*d^2*f^2))*x/b^3/d^3-1/8*B*(-a*d+b*c)*g^2*(-a*d*g-b*c*g+4*b*d*f)*x^2/b^2
/d^2-1/12*B*(-a*d+b*c)*g^3*x^3/b/d-1/4*B*(-a*g+b*f)^4*ln(b*x+a)/b^4/g+1/4*(
g*x+f)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))/g+1/4*B*(-c*g+d*f)^4*ln(d*x+c)/d^4/g
```

Rubi [A] time = 0.34, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2525, 12, 72}

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g}-Bg^2x^2($$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*x)/(4*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g -
 a*d*g)*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3)/(12*b*d) - (B*(b*f - a*g
)^4*Log[a + b*x])/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(4*g) + (B*(d*f - c*g)^4*Log[c + d*x])/(4*d^4*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx=\frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4g}-\frac{B\int\frac{(bc-ad)(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$=\frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4g}-\frac{(B(bc-ad))\int\frac{(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$=\frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4g}-\frac{(B(bc-ad))\int\Big(\frac{g^2\big(a^2d^2g^2-abdg(4df-}{}}{}$$

$$=-\frac{B(bc-ad)g\,\big(a^2d^2g^2-abdg(4df-cg)+b^2\,\big(6d^2f^2-4cdfg+c^2g}{4b^3d^3}$$

Mathematica [**A**] time = 0.27, size = 215, normalized size = 0.95

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B\big(6bdg^2x(bc-ad)\big(a^2d^2g^2+abdg(cg-4df)+b^2\big(c^2g^2-4cdfg+6d^2f^2\big)\big)+2b^3d^3g^4x^3(bc-ad)+3b^2d^2g^3x^2(bc}{6b^4d^4}}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(6*b*d*(b*c - a*d)*g
^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2
*g^2))*x + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2 + 2*b^3*
d^3*(b*c - a*d)*g^4*x^3 + 6*d^4*(b*f - a*g)^4*Log[a + b*x] - 6*b^4*(d*f - c
*g)^4*Log[c + d*x]))/(6*b^4*d^4))/(4*g)
```

fricas [**B**] time = 0.95, size = 445, normalized size = 1.96

$$\frac{6\,Ab^4d^4g^3x^4+2\,\big(12\,Ab^4d^4fg^2-\big(Bb^4cd^3-Bab^3d^4\big)g^3\big)x^3+3\,\big(12\,Ab^4d^4f^2g-4\,\big(Bb^4cd^3-Bab^3d^4\big)fg^2+\big(Bb^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 + 2*(12*A*b^4*d^4*f*g^2 - (B*b^4*c*d^3 - B*a*b^3*
d^4)*g^3)*x^3 + 3*(12*A*b^4*d^4*f^2*g - 4*(B*b^4*c*d^3 - B*a*b^3*d^4)*f*g^2
 + (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g^3)*x^2 + 6*(4*A*b^4*d^4*f^3 - 6*(B*b^4
*c*d^3 - B*a*b^3*d^4)*f^2*g + 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*f*g^2 - (B*
b^4*c^3*d - B*a^3*b*d^4)*g^3)*x + 6*(4*B*a*b^3*d^4*f^3 - 6*B*a^2*b^2*d^4*f^
2*g + 4*B*a^3*b*d^4*f*g^2 - B*a^4*d^4*g^3)*log(b*x + a) - 6*(4*B*b^4*c*d^3*
f^3 - 6*B*b^4*c^2*d^2*f^2*g + 4*B*b^4*c^3*d*f*g^2 - B*b^4*c^4*g^3)*log(d*x
+ c) + 6*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*d^4*f*g^2*x^3 + 6*B*b^4*d^4*f^2*g*x^2
 + 4*B*b^4*d^4*f^3*x)*log((b*e*x + a*e)/(d*x + c)))/(b^4*d^4)
```

giac [**B**] time = 3.23, size = 11299, normalized size = 49.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/24*(24*B*b^9*c^2*d^3*f^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 48*B
*a*b^8*c*d^4*f^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 24*B*a^2*b^7*d
```

```
^5*f^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 36*B*b^9*c^3*d^2*f^2*g*e
^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 36*B*a*b^8*c^2*d^3*f^2*g*e^5*log
(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 36*B*a^2*b^7*c*d^4*f^2*g*e^5*log(-b*e
+ (b*x*e + a*e)*d/(d*x + c)) - 36*B*a^3*b^6*d^5*f^2*g*e^5*log(-b*e + (b*x*e
 + a*e)*d/(d*x + c)) + 24*B*b^9*c^4*d*f*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/
(d*x + c)) - 24*B*a*b^8*c^3*d^2*f*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c)) - 24*B*a^3*b^6*c*d^4*f*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) +
 24*B*a^4*b^5*d^5*f*g^2*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 6*B*b^9
*c^5*g^3*e^5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*B*a*b^8*c^4*d*g^3*e^
5*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*B*a^4*b^5*c*d^4*g^3*e^5*log(-b*
e + (b*x*e + a*e)*d/(d*x + c)) - 6*B*a^5*b^4*d^5*g^3*e^5*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c)) - 96*(b*x*e + a*e)*B*b^8*c^2*d^4*f^3*e^4*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c) + 192*(b*x*e + a*e)*B*a*b^7*c*d^5*f^3*e^4
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 96*(b*x*e + a*e)*B*a^2*b
^6*d^6*f^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 144*(b*x*e
 + a*e)*B*b^8*c^3*d^3*f^2*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c) - 144*(b*x*e + a*e)*B*a*b^7*c^2*d^4*f^2*g*e^4*log(-b*e + (b*x*e + a*e)
*d/(d*x + c))/(d*x + c) - 144*(b*x*e + a*e)*B*a^2*b^6*c*d^5*f^2*g*e^4*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 144*(b*x*e + a*e)*B*a^3*b^5*d^
6*f^2*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 96*(b*x*e + a
*e)*B*b^8*c^4*d^2*f*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
 + 96*(b*x*e + a*e)*B*a*b^7*c^3*d^3*f*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d
*x + c))/(d*x + c) + 96*(b*x*e + a*e)*B*a^3*b^5*c*d^5*f*g^2*e^4*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 96*(b*x*e + a*e)*B*a^4*b^4*d^6*f*g^2
*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*b
^8*c^5*d*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 24*(b*x*
e + a*e)*B*a*b^7*c^4*d^2*g^3*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
 + c) - 24*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^3*e^4*log(-b*e + (b*x*e + a*e)*d
/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 144*(b*x*e + a*e)^2*B*b^7*c^2*d^5*f^3
*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 288*(b*x*e + a*e)^
2*B*a*b^6*c*d^6*f^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 +
 144*(b*x*e + a*e)^2*B*a^2*b^5*d^7*f^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^2 - 216*(b*x*e + a*e)^2*B*b^7*c^3*d^4*f^2*g*e^3*log(-b*e +
(b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 216*(b*x*e + a*e)^2*B*a*b^6*c^2*d^
5*f^2*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 216*(b*x*e
+ a*e)^2*B*a^2*b^5*c*d^6*f^2*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^2 - 216*(b*x*e + a*e)^2*B*a^3*b^4*d^7*f^2*g*e^3*log(-b*e + (b*x*e +
 a*e)*d/(d*x + c))/(d*x + c)^2 + 144*(b*x*e + a*e)^2*B*b^7*c^4*d^3*f*g^2*e^
3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 144*(b*x*e + a*e)^2*B
*a*b^6*c^3*d^4*f*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2
- 144*(b*x*e + a*e)^2*B*a^3*b^4*c*d^6*f*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/
(d*x + c))/(d*x + c)^2 + 144*(b*x*e + a*e)^2*B*a^4*b^3*d^7*f*g^2*e^3*log(-b
*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 36*(b*x*e + a*e)^2*B*b^7*c^5*
d^2*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 36*(b*x*e +
 a*e)^2*B*a*b^6*c^4*d^3*g^3*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c)^2 + 36*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*g^3*e^3*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^2 - 36*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^3*e^3*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 96*(b*x*e + a*e)^3*B*b^6*c^2
*d^6*f^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 192*(b*x*e
 + a*e)^3*B*a*b^5*c*d^7*f^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x
+ c)^3 - 96*(b*x*e + a*e)^3*B*a^2*b^4*d^8*f^3*e^2*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^3 + 144*(b*x*e + a*e)^3*B*b^6*c^3*d^5*f^2*g*e^2*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 144*(b*x*e + a*e)^3*B*a*b^5
*c^2*d^6*f^2*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 144*
(b*x*e + a*e)^3*B*a^2*b^4*c*d^7*f^2*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c))/(d*x + c)^3 + 144*(b*x*e + a*e)^3*B*a^3*b^3*d^8*f^2*g*e^2*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 96*(b*x*e + a*e)^3*B*b^6*c^4*d^4*f*
g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 96*(b*x*e + a*e
```

```
)^3*B*a*b^5*c^3*d^5*f*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x +
c)^3 + 96*(b*x*e + a*e)^3*B*a^3*b^3*c*d^7*f*g^2*e^2*log(-b*e + (b*x*e + a*e
)*d/(d*x + c))/(d*x + c)^3 - 96*(b*x*e + a*e)^3*B*a^4*b^2*d^8*f*g^2*e^2*log
(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*b^6*c
^5*d^3*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 24*(b*x*
e + a*e)^3*B*a*b^5*c^4*d^4*g^3*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
*x + c)^3 - 24*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g^3*e^2*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*a^5*b*d^8*g^3*e^2*log(
-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^4*B*b^5*c^
2*d^7*f^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 48*(b*x*e +
 a*e)^4*B*a*b^4*c*d^8*f^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^4 + 24*(b*x*e + a*e)^4*B*a^2*b^3*d^9*f^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c)^4 - 36*(b*x*e + a*e)^4*B*b^5*c^3*d^6*f^2*g*e*log(-b*e + (b
*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 36*(b*x*e + a*e)^4*B*a*b^4*c^2*d^7*f
^2*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 36*(b*x*e + a*e)
^4*B*a^2*b^3*c*d^8*f^2*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^
4 - 36*(b*x*e + a*e)^4*B*a^3*b^2*d^9*f^2*g*e*log(-b*e + (b*x*e + a*e)*d/(d*
x + c))/(d*x + c)^4 + 24*(b*x*e + a*e)^4*B*b^5*c^4*d^5*f*g^2*e*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 24*(b*x*e + a*e)^4*B*a*b^4*c^3*d^6*
f*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 24*(b*x*e + a*e
)^4*B*a^3*b^2*c*d^8*f*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^4 + 24*(b*x*e + a*e)^4*B*a^4*b*d^9*f*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c)^4 - 6*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^3*e*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^4 + 6*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^3*e
*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 + 6*(b*x*e + a*e)^4*B*a^
4*b*c*d^8*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^4 - 6*(b*x*
e + a*e)^4*B*a^5*d^9*g^3*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^
4 + 24*(b*x*e + a*e)*B*b^8*c^2*d^4*f^3*e^4*log((b*x*e + a*e)/(d*x + c))/(d*
x + c) - 48*(b*x*e + a*e)*B*a*b^7*c*d^5*f^3*e^4*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c) + 24*(b*x*e + a*e)*B*a^2*b^6*d^6*f^3*e^4*log((b*x*e + a*e)/(d*x
 + c))/(d*x + c) - 72*(b*x*e + a*e)*B*a*b^7*c^2*d^4*f^2*g*e^4*log((b*x*e +
a*e)/(d*x + c))/(d*x + c) + 144*(b*x*e + a*e)*B*a^2*b^6*c*d^5*f^2*g*e^4*log
((b*x*e + a*e)/(d*x + c))/(d*x + c) - 72*(b*x*e + a*e)*B*a^3*b^5*d^6*f^2*g*
e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 72*(b*x*e + a*e)*B*a^2*b^6*c^2
*d^4*f*g^2*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 144*(b*x*e + a*e)*B
*a^3*b^5*c*d^5*f*g^2*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 72*(b*x*e
 + a*e)*B*a^4*b^4*d^6*f*g^2*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 24
*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^3*e^4*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c) + 48*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^3*e^4*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c) - 24*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4*log((b*x*e + a*e)/(d*x
 + c))/(d*x + c) - 72*(b*x*e + a*e)^2*B*b^7*c^2*d^5*f^3*e^3*log((b*x*e + a*
e)/(d*x + c))/(d*x + c)^2 + 144*(b*x*e + a*e)^2*B*a*b^6*c*d^6*f^3*e^3*log((
b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 72*(b*x*e + a*e)^2*B*a^2*b^5*d^7*f^3*
e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 36*(b*x*e + a*e)^2*B*b^7*c^3
*d^4*f^2*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 108*(b*x*e + a*e)
^2*B*a*b^6*c^2*d^5*f^2*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 324
*(b*x*e + a*e)^2*B*a^2*b^5*c*d^6*f^2*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*
x + c)^2 + 180*(b*x*e + a*e)^2*B*a^3*b^4*d^7*f^2*g*e^3*log((b*x*e + a*e)/(d
*x + c))/(d*x + c)^2 - 72*(b*x*e + a*e)^2*B*a*b^6*c^3*d^4*f*g^2*e^3*log((b*
x*e + a*e)/(d*x + c))/(d*x + c)^2 + 216*(b*x*e + a*e)^2*B*a^3*b^4*c*d^6*f*g
^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 144*(b*x*e + a*e)^2*B*a^4
*b^3*d^7*f*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 36*(b*x*e + a
*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 -
36*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3*log((b*x*e + a*e)/(d*x + c))/(
d*x + c)^2 - 36*(b*x*e + a*e)^2*B*a^4*b^3*c*d^6*g^3*e^3*log((b*x*e + a*e)/(
d*x + c))/(d*x + c)^2 + 36*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^3*e^3*log((b*x*e
 + a*e)/(d*x + c))/(d*x + c)^2 + 72*(b*x*e + a*e)^3*B*b^6*c^2*d^6*f^3*e^2*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 144*(b*x*e + a*e)^3*B*a*b^5*c*d^7
*f^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 72*(b*x*e + a*e)^3*B*a^
```

```
2*b^4*d^8*f^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 72*(b*x*e + a*
e)^3*B*b^6*c^3*d^5*f^2*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 216
*(b*x*e + a*e)^3*B*a^2*b^4*c*d^7*f^2*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*
x + c)^3 - 144*(b*x*e + a*e)^3*B*a^3*b^3*d^8*f^2*g*e^2*log((b*x*e + a*e)/(d
*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*b^6*c^4*d^4*f*g^2*e^2*log((b*x*
e + a*e)/(d*x + c))/(d*x + c)^3 + 48*(b*x*e + a*e)^3*B*a*b^5*c^3*d^5*f*g^2*
e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 72*(b*x*e + a*e)^3*B*a^2*b^4
*c^2*d^6*f*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 96*(b*x*e + a
*e)^3*B*a^3*b^3*c*d^7*f*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 +
96*(b*x*e + a*e)^3*B*a^4*b^2*d^8*f*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*
x + c)^3 - 24*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^3*e^2*log((b*x*e + a*e)/(d*
x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^3*e^2*log((b*x
*e + a*e)/(d*x + c))/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*a^4*b^2*c*d^7*g^3*e
^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 24*(b*x*e + a*e)^3*B*a^5*b*d^
8*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 24*(b*x*e + a*e)^4*B*b
^5*c^2*d^7*f^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 48*(b*x*e + a*e
)^4*B*a*b^4*c*d^8*f^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 24*(b*x*
e + a*e)^4*B*a^2*b^3*d^9*f^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 3
6*(b*x*e + a*e)^4*B*b^5*c^3*d^6*f^2*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x +
 c)^4 - 36*(b*x*e + a*e)^4*B*a*b^4*c^2*d^7*f^2*g*e*log((b*x*e + a*e)/(d*x +
 c))/(d*x + c)^4 - 36*(b*x*e + a*e)^4*B*a^2*b^3*c*d^8*f^2*g*e*log((b*x*e +
a*e)/(d*x + c))/(d*x + c)^4 + 36*(b*x*e + a*e)^4*B*a^3*b^2*d^9*f^2*g*e*log(
(b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 24*(b*x*e + a*e)^4*B*b^5*c^4*d^5*f*g
^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 24*(b*x*e + a*e)^4*B*a*b^4*
c^3*d^6*f*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 + 24*(b*x*e + a*e)
^4*B*a^3*b^2*c*d^8*f*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4 - 24*(b
*x*e + a*e)^4*B*a^4*b*d^9*f*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^4
 + 6*(b*x*e + a*e)^4*B*b^5*c^5*d^4*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x +
 c)^4 - 6*(b*x*e + a*e)^4*B*a*b^4*c^4*d^5*g^3*e*log((b*x*e + a*e)/(d*x + c)
)/(d*x + c)^4 - 6*(b*x*e + a*e)^4*B*a^4*b*c*d^8*g^3*e*log((b*x*e + a*e)/(d*
x + c))/(d*x + c)^4 + 6*(b*x*e + a*e)^4*B*a^5*d^9*g^3*e*log((b*x*e + a*e)/(
d*x + c))/(d*x + c)^4 + 24*A*b^9*c^2*d^3*f^3*e^5 - 48*A*a*b^8*c*d^4*f^3*e^5
 + 24*A*a^2*b^7*d^5*f^3*e^5 - 36*A*b^9*c^3*d^2*f^2*g*e^5 - 36*B*b^9*c^3*d^2
*f^2*g*e^5 + 36*A*a*b^8*c^2*d^3*f^2*g*e^5 + 108*B*a*b^8*c^2*d^3*f^2*g*e^5 +
 36*A*a^2*b^7*c*d^4*f^2*g*e^5 - 108*B*a^2*b^7*c*d^4*f^2*g*e^5 - 36*A*a^3*b^
6*d^5*f^2*g*e^5 + 36*B*a^3*b^6*d^5*f^2*g*e^5 + 24*A*b^9*c^4*d*f*g^2*e^5 + 3
6*B*b^9*c^4*d*f*g^2*e^5 - 24*A*a*b^8*c^3*d^2*f*g^2*e^5 - 72*B*a*b^8*c^3*d^2
*f*g^2*e^5 - 24*A*a^3*b^6*c*d^4*f*g^2*e^5 + 72*B*a^3*b^6*c*d^4*f*g^2*e^5 +
24*A*a^4*b^5*d^5*f*g^2*e^5 - 36*B*a^4*b^5*d^5*f*g^2*e^5 - 6*A*b^9*c^5*g^3*e
^5 - 11*B*b^9*c^5*g^3*e^5 + 6*A*a*b^8*c^4*d*g^3*e^5 + 19*B*a*b^8*c^4*d*g^3*
e^5 - 2*B*a^2*b^7*c^3*d^2*g^3*e^5 + 2*B*a^3*b^6*c^2*d^3*g^3*e^5 + 6*A*a^4*b
^5*c*d^4*g^3*e^5 - 19*B*a^4*b^5*c*d^4*g^3*e^5 - 6*A*a^5*b^4*d^5*g^3*e^5 + 1
1*B*a^5*b^4*d^5*g^3*e^5 - 72*(b*x*e + a*e)*A*b^8*c^2*d^4*f^3*e^4/(d*x + c)
 + 144*(b*x*e + a*e)*A*a*b^7*c*d^5*f^3*e^4/(d*x + c) - 72*(b*x*e + a*e)*A*a^
2*b^6*d^6*f^3*e^4/(d*x + c) + 144*(b*x*e + a*e)*A*b^8*c^3*d^3*f^2*g*e^4/(d*
x + c) + 108*(b*x*e + a*e)*B*b^8*c^3*d^3*f^2*g*e^4/(d*x + c) - 216*(b*x*e +
 a*e)*A*a*b^7*c^2*d^4*f^2*g*e^4/(d*x + c) - 324*(b*x*e + a*e)*B*a*b^7*c^2*d
^4*f^2*g*e^4/(d*x + c) + 324*(b*x*e + a*e)*B*a^2*b^6*c*d^5*f^2*g*e^4/(d*x +
 c) + 72*(b*x*e + a*e)*A*a^3*b^5*d^6*f^2*g*e^4/(d*x + c) - 108*(b*x*e + a*e
)*B*a^3*b^5*d^6*f^2*g*e^4/(d*x + c) - 96*(b*x*e + a*e)*A*b^8*c^4*d^2*f*g^2*
e^4/(d*x + c) - 120*(b*x*e + a*e)*B*b^8*c^4*d^2*f*g^2*e^4/(d*x + c) + 96*(b
*x*e + a*e)*A*a*b^7*c^3*d^3*f*g^2*e^4/(d*x + c) + 264*(b*x*e + a*e)*B*a*b^7
*c^3*d^3*f*g^2*e^4/(d*x + c) + 72*(b*x*e + a*e)*A*a^2*b^6*c^2*d^4*f*g^2*e^4
/(d*x + c) - 72*(b*x*e + a*e)*B*a^2*b^6*c^2*d^4*f*g^2*e^4/(d*x + c) - 48*(b
*x*e + a*e)*A*a^3*b^5*c*d^5*f*g^2*e^4/(d*x + c) - 168*(b*x*e + a*e)*B*a^3*b
^5*c*d^5*f*g^2*e^4/(d*x + c) - 24*(b*x*e + a*e)*A*a^4*b^4*d^6*f*g^2*e^4/(d*
x + c) + 96*(b*x*e + a*e)*B*a^4*b^4*d^6*f*g^2*e^4/(d*x + c) + 24*(b*x*e + a
*e)*A*b^8*c^5*d*g^3*e^4/(d*x + c) + 38*(b*x*e + a*e)*B*b^8*c^5*d*g^3*e^4/(d
*x + c) - 24*(b*x*e + a*e)*A*a*b^7*c^4*d^2*g^3*e^4/(d*x + c) - 70*(b*x*e +
```

```
a*e)*B*a*b^7*c^4*d^2*g^3*e^4/(d*x + c) + 8*(b*x*e + a*e)*B*a^2*b^6*c^3*d^3*
g^3*e^4/(d*x + c) - 24*(b*x*e + a*e)*A*a^3*b^5*c^2*d^4*g^3*e^4/(d*x + c) +
16*(b*x*e + a*e)*B*a^3*b^5*c^2*d^4*g^3*e^4/(d*x + c) + 24*(b*x*e + a*e)*A*a
^4*b^4*c*d^5*g^3*e^4/(d*x + c) + 34*(b*x*e + a*e)*B*a^4*b^4*c*d^5*g^3*e^4/(
d*x + c) - 26*(b*x*e + a*e)*B*a^5*b^3*d^6*g^3*e^4/(d*x + c) + 72*(b*x*e + a
*e)^2*A*b^7*c^2*d^5*f^3*e^3/(d*x + c)^2 - 144*(b*x*e + a*e)^2*A*a*b^6*c*d^6
*f^3*e^3/(d*x + c)^2 + 72*(b*x*e + a*e)^2*A*a^2*b^5*d^7*f^3*e^3/(d*x + c)^2
 - 180*(b*x*e + a*e)^2*A*b^7*c^3*d^4*f^2*g*e^3/(d*x + c)^2 - 108*(b*x*e + a
*e)^2*B*b^7*c^3*d^4*f^2*g*e^3/(d*x + c)^2 + 324*(b*x*e + a*e)^2*A*a*b^6*c^2
*d^5*f^2*g*e^3/(d*x + c)^2 + 324*(b*x*e + a*e)^2*B*a*b^6*c^2*d^5*f^2*g*e^3/
(d*x + c)^2 - 108*(b*x*e + a*e)^2*A*a^2*b^5*c*d^6*f^2*g*e^3/(d*x + c)^2 - 3
24*(b*x*e + a*e)^2*B*a^2*b^5*c*d^6*f^2*g*e^3/(d*x + c)^2 - 36*(b*x*e + a*e)
^2*A*a^3*b^4*d^7*f^2*g*e^3/(d*x + c)^2 + 108*(b*x*e + a*e)^2*B*a^3*b^4*d^7*
f^2*g*e^3/(d*x + c)^2 + 144*(b*x*e + a*e)^2*A*b^7*c^4*d^3*f*g^2*e^3/(d*x +
c)^2 + 132*(b*x*e + a*e)^2*B*b^7*c^4*d^3*f*g^2*e^3/(d*x + c)^2 - 216*(b*x*e
 + a*e)^2*A*a*b^6*c^3*d^4*f*g^2*e^3/(d*x + c)^2 - 312*(b*x*e + a*e)^2*B*a*b
^6*c^3*d^4*f*g^2*e^3/(d*x + c)^2 + 144*(b*x*e + a*e)^2*B*a^2*b^5*c^2*d^5*f*
g^2*e^3/(d*x + c)^2 + 72*(b*x*e + a*e)^2*A*a^3*b^4*c*d^6*f*g^2*e^3/(d*x + c
)^2 + 120*(b*x*e + a*e)^2*B*a^3*b^4*c*d^6*f*g^2*e^3/(d*x + c)^2 - 84*(b*x*e
 + a*e)^2*B*a^4*b^3*d^7*f*g^2*e^3/(d*x + c)^2 - 36*(b*x*e + a*e)^2*A*b^7*c^
5*d^2*g^3*e^3/(d*x + c)^2 - 45*(b*x*e + a*e)^2*B*b^7*c^5*d^2*g^3*e^3/(d*x +
 c)^2 + 36*(b*x*e + a*e)^2*A*a*b^6*c^4*d^3*g^3*e^3/(d*x + c)^2 + 93*(b*x*e
+ a*e)^2*B*a*b^6*c^4*d^3*g^3*e^3/(d*x + c)^2 + 36*(b*x*e + a*e)^2*A*a^2*b^5
*c^3*d^4*g^3*e^3/(d*x + c)^2 - 30*(b*x*e + a*e)^2*B*a^2*b^5*c^3*d^4*g^3*e^3
/(d*x + c)^2 - 36*(b*x*e + a*e)^2*A*a^3*b^4*c^2*d^5*g^3*e^3/(d*x + c)^2 - 1
8*(b*x*e + a*e)^2*B*a^3*b^4*c^2*d^5*g^3*e^3/(d*x + c)^2 - 21*(b*x*e + a*e)^
2*B*a^4*b^3*c*d^6*g^3*e^3/(d*x + c)^2 + 21*(b*x*e + a*e)^2*B*a^5*b^2*d^7*g^
3*e^3/(d*x + c)^2 - 24*(b*x*e + a*e)^3*A*b^6*c^2*d^6*f^3*e^2/(d*x + c)^3 +
48*(b*x*e + a*e)^3*A*a*b^5*c*d^7*f^3*e^2/(d*x + c)^3 - 24*(b*x*e + a*e)^3*A
*a^2*b^4*d^8*f^3*e^2/(d*x + c)^3 + 72*(b*x*e + a*e)^3*A*b^6*c^3*d^5*f^2*g*e
^2/(d*x + c)^3 + 36*(b*x*e + a*e)^3*B*b^6*c^3*d^5*f^2*g*e^2/(d*x + c)^3 - 1
44*(b*x*e + a*e)^3*A*a*b^5*c^2*d^6*f^2*g*e^2/(d*x + c)^3 - 108*(b*x*e + a*e
)^3*B*a*b^5*c^2*d^6*f^2*g*e^2/(d*x + c)^3 + 72*(b*x*e + a*e)^3*A*a^2*b^4*c*
d^7*f^2*g*e^2/(d*x + c)^3 + 108*(b*x*e + a*e)^3*B*a^2*b^4*c*d^7*f^2*g*e^2/(
d*x + c)^3 - 36*(b*x*e + a*e)^3*B*a^3*b^3*d^8*f^2*g*e^2/(d*x + c)^3 - 72*(b
*x*e + a*e)^3*A*b^6*c^4*d^4*f*g^2*e^2/(d*x + c)^3 - 48*(b*x*e + a*e)^3*B*b^
6*c^4*d^4*f*g^2*e^2/(d*x + c)^3 + 144*(b*x*e + a*e)^3*A*a*b^5*c^3*d^5*f*g^2
*e^2/(d*x + c)^3 + 120*(b*x*e + a*e)^3*B*a*b^5*c^3*d^5*f*g^2*e^2/(d*x + c)^
3 - 72*(b*x*e + a*e)^3*A*a^2*b^4*c^2*d^6*f*g^2*e^2/(d*x + c)^3 - 72*(b*x*e
+ a*e)^3*B*a^2*b^4*c^2*d^6*f*g^2*e^2/(d*x + c)^3 - 24*(b*x*e + a*e)^3*B*a^3
*b^3*c*d^7*f*g^2*e^2/(d*x + c)^3 + 24*(b*x*e + a*e)^3*B*a^4*b^2*d^8*f*g^2*e
^2/(d*x + c)^3 + 24*(b*x*e + a*e)^3*A*b^6*c^5*d^3*g^3*e^2/(d*x + c)^3 + 18*
(b*x*e + a*e)^3*B*b^6*c^5*d^3*g^3*e^2/(d*x + c)^3 - 48*(b*x*e + a*e)^3*A*a*
b^5*c^4*d^4*g^3*e^2/(d*x + c)^3 - 42*(b*x*e + a*e)^3*B*a*b^5*c^4*d^4*g^3*e^
2/(d*x + c)^3 + 24*(b*x*e + a*e)^3*A*a^2*b^4*c^3*d^5*g^3*e^2/(d*x + c)^3 +
24*(b*x*e + a*e)^3*B*a^2*b^4*c^3*d^5*g^3*e^2/(d*x + c)^3 + 6*(b*x*e + a*e)^
3*B*a^4*b^2*c*d^7*g^3*e^2/(d*x + c)^3 - 6*(b*x*e + a*e)^3*B*a^5*b*d^8*g^3*e
^2/(d*x + c)^3)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(
b*c - a*d)))/(b^8*d^4*e^4 - 4*(b*x*e + a*e)*b^7*d^5*e^3/(d*x + c) + 6*(b*x*
e + a*e)^2*b^6*d^6*e^2/(d*x + c)^2 - 4*(b*x*e + a*e)^3*b^5*d^7*e/(d*x + c)^
3 + (b*x*e + a*e)^4*b^4*d^8/(d*x + c)^4)
```

maple [B] time = 0.17, size = 8605, normalized size = 37.91

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] result too large to display
```

maxima [**A**] time = 0.98, size = 415, normalized size = 1.83

$$\frac{1}{4}Ag^3x^4+Afg^2x^3+\frac{3}{2}Af^2gx^2+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)Bf^3+\frac{3}{2}\Bigl(x^2\log\Bigl(\frac{bex}{dx+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/4*A*g^3*x^4 + A*f*g^2*x^3 + 3/2*A*f^2*g*x^2 + (x*log(b*e*x/(d*x + c) + a*
e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*f^3 + 3/2*(x^2*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^
2 - (b*c - a*d)*x/(b*d))*B*f^2*g + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*
x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b
*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f*g^2 + 1/24*(6*x^4*log(b
*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +
c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6
*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*g^3 + A*f^3*x
```

mupad [**B**] time = 4.69, size = 741, normalized size = 3.26

$$x\Biggl(\frac{4\,A\,b\,d\,f^3+12\,A\,a\,c\,f\,g^2+12\,A\,a\,d\,f^2\,g+12\,A\,b\,c\,f^2\,g+6\,B\,a\,d\,f^2\,g-6\,B\,b\,c\,f^2\,g}{4\,b\,d}+\frac{(4\,a\,d+4\,b\,c)\Biggl(\Bigl(\frac{4\,A\,a\,d\,g^3+4}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] x*((4*A*b*d*f^3 + 12*A*a*c*f*g^2 + 12*A*a*d*f^2*g + 12*A*b*c*f^2*g + 6*B*a*
d*f^2*g - 6*B*b*c*f^2*g)/(4*b*d) + ((4*a*d + 4*b*c)*((((4*A*a*d*g^3 + 4*A*b
*c*g^3 + B*a*d*g^3 - B*b*c*g^3 + 12*A*b*d*f*g^2)/(4*b*d) - (A*g^3*(4*a*d +
4*b*c))/(4*b*d))*(4*a*d + 4*b*c))/(4*b*d) - (4*A*a*c*g^3 + 12*A*a*d*f*g^2 +
 12*A*b*c*f*g^2 + 12*A*b*d*f^2*g + 4*B*a*d*f*g^2 - 4*B*b*c*f*g^2)/(4*b*d) +
 (A*a*c*g^3)/(b*d)))/(4*b*d) - (a*c*((4*A*a*d*g^3 + 4*A*b*c*g^3 + B*a*d*g^3
 - B*b*c*g^3 + 12*A*b*d*f*g^2)/(4*b*d) - (A*g^3*(4*a*d + 4*b*c))/(4*b*d)))/
(b*d)) - x^2*((((4*A*a*d*g^3 + 4*A*b*c*g^3 + B*a*d*g^3 - B*b*c*g^3 + 12*A*b
*d*f*g^2)/(4*b*d) - (A*g^3*(4*a*d + 4*b*c))/(4*b*d))*(4*a*d + 4*b*c))/(8*b*
d) - (4*A*a*c*g^3 + 12*A*a*d*f*g^2 + 12*A*b*c*f*g^2 + 12*A*b*d*f^2*g + 4*B*
a*d*f*g^2 - 4*B*b*c*f*g^2)/(8*b*d) + (A*a*c*g^3)/(2*b*d)) + log((e*(a + b*x
))/(c + d*x))*((B*g^3*x^4)/4 + B*f^3*x + (3*B*f^2*g*x^2)/2 + B*f*g^2*x^3) +
 x^3*((4*A*a*d*g^3 + 4*A*b*c*g^3 + B*a*d*g^3 - B*b*c*g^3 + 12*A*b*d*f*g^2)/
(12*b*d) - (A*g^3*(4*a*d + 4*b*c))/(12*b*d)) + (A*g^3*x^4)/4 - (log(a + b*x
)*(B*a^4*g^3 - 4*B*a*b^3*f^3 + 6*B*a^2*b^2*f^2*g - 4*B*a^3*b*f*g^2))/(4*b^4
) + (log(c + d*x)*(B*c^4*g^3 - 4*B*c*d^3*f^3 + 6*B*c^2*d^2*f^2*g - 4*B*c^3*
d*f*g^2))/(4*d^4)
```

sympy [**B**] time = 13.27, size = 998, normalized size = 4.40

$$\frac{Ag^3x^4}{4}-\frac{Ba\left(ag-2bf\right)\left(a^2g^2-2abfg+2b^2f^2\right)\log\Biggl(x+\frac{Ba^4cd^3g^3-4Ba^3bcd^3fg^2+6Ba^2b^2cd^3f^2g+\frac{Ba^2d^4\left(ag-2bf\right)\left(a^2g^2-2abfg+2b^2f^2\right)}{b}+}{Ba^4d^4g^3-4Ba^3bd^4fg^2+6Ba^2b^2d^4f^2g-4B}}{4b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g**3*x**4/4 - B*a*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)*log
(x + (B*a**4*c*d**3*g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*
f**2*g + B*a**2*d**4*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)/b
+ B*a*b**3*c**4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2
*g - 8*B*a*b**3*c*d**3*f**3 - B*a*c*d**3*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f
*g + 2*b**2*f**2))/(B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b*
*2*d**4*f**2*g - 4*B*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*
f*g**2 + 6*B*b**4*c**2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(4*b**4) + B*c*
(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)*log(x + (B*a**4*c*d**3*
g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*f**2*g + B*a*b**3*c*
*4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2*g - 8*B*a*b*
*3*c*d**3*f**3 - B*a*b**3*c*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f
**2) + B*b**4*c**2*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)/d)/(
B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b**2*d**4*f**2*g - 4*B
*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*f*g**2 + 6*B*b**4*c*
*2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(4*d**4) + x**3*(A*f*g**2 + B*a*g**
3/(12*b) - B*c*g**3/(12*d)) + x**2*(3*A*f**2*g/2 - B*a**2*g**3/(8*b**2) + B
*a*f*g**2/(2*b) + B*c**2*g**3/(8*d**2) - B*c*f*g**2/(2*d)) + x*(A*f**3 + B*
a**3*g**3/(4*b**3) - B*a**2*f*g**2/b**2 + 3*B*a*f**2*g/(2*b) - B*c**3*g**3/
(4*d**3) + B*c**2*f*g**2/d**2 - 3*B*c*f**2*g/(2*d)) + (B*f**3*x + 3*B*f**2*
g*x**2/2 + B*f*g**2*x**3 + B*g**3*x**4/4)*log(e*(a + b*x)/(c + d*x))
```

3.232 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=150

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g}-\frac{B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{Bg^2x^2(bc-ad)}{6bd}+B$$

```
[Out] -1/3*B*(-a*d+b*c)*g*(-a*d*g-b*c*g+3*b*d*f)*x/b^2/d^2-1/6*B*(-a*d+b*c)*g^2*x
^2/b/d-1/3*B*(-a*g+b*f)^3*ln(b*x+a)/b^3/g+1/3*(g*x+f)^3*(A+B*ln(e*(b*x+a)/(
d*x+c)))/g+1/3*B*(-c*g+d*f)^3*ln(d*x+c)/d^3/g
```

Rubi [A] time = 0.17, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g}-\frac{Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2x^2(bc-ad)}{6bd}+B$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*x)/(3*b^2*d^2) - (B*(b*c - a*d)
*g^2*x^2)/(6*b*d) - (B*(b*f - a*g)^3*Log[a + b*x])/(3*b^3*g) + ((f + g*x)^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*g) + (B*(d*f - c*g)^3*Log[c + d*x
])/(3*d^3*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3g}-\frac{B\int\frac{(bc-ad)(f+gx)^3}{(a+bx)(c+dx)}dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3g}-\frac{(B(bc-ad))\int\frac{(f+gx)^3}{(a+bx)(c+dx)}dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3g}-\frac{(B(bc-ad))\int\left(\frac{g^2(3bdf-bcg-adg)}{b^2d^2}+\right.}{}$$

$$=-\frac{B(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2}-\frac{B(bc-ad)g^2x^2}{6bd}-\frac{B(bf-ag)^3}{3b}$$

Mathematica [A] time = 0.13, size = 142, normalized size = 0.95

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B\left(b^2d^2g^3x^2(bc-ad)+2bdg^2x(bc-ad)(-adg-bcg+3bdf)+2d^3(bf-ag)^3\log(a+bx)-2b^3(df-cg)^3\log(c+d\right.}{2b^3d^3}}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(2*b*d*(b*c - a*d)*g
^2*(3*b*d*f - b*c*g - a*d*g)*x + b^2*d^2*(b*c - a*d)*g^3*x^2 + 2*d^3*(b*f -
 a*g)^3*Log[a + b*x] - 2*b^3*(d*f - c*g)^3*Log[c + d*x]))/(2*b^3*d^3))/(3*g
)
```

fricas [A] time = 0.88, size = 280, normalized size = 1.87

$$\frac{2\,Ab^3d^3g^2x^3+\left(6\,Ab^3d^3fg-\left(Bb^3cd^2-Bab^2d^3\right)g^2\right)x^2+2\left(3\,Ab^3d^3f^2-3\left(Bb^3cd^2-Bab^2d^3\right)fg+\left(Bb^3c^2d-\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 + (6*A*b^3*d^3*f*g - (B*b^3*c*d^2 - B*a*b^2*d^3)*g
^2)*x^2 + 2*(3*A*b^3*d^3*f^2 - 3*(B*b^3*c*d^2 - B*a*b^2*d^3)*f*g + (B*b^3*c
^2*d - B*a^2*b*d^3)*g^2)*x + 2*(3*B*a*b^2*d^3*f^2 - 3*B*a^2*b*d^3*f*g + B*a
^3*d^3*g^2)*log(b*x + a) - 2*(3*B*b^3*c*d^2*f^2 - 3*B*b^3*c^2*d*f*g + B*b^3
*c^3*g^2)*log(d*x + c) + 2*(B*b^3*d^3*g^2*x^3 + 3*B*b^3*d^3*f*g*x^2 + 3*B*b
^3*d^3*f^2*x)*log((b*e*x + a*e)/(d*x + c)))/(b^3*d^3)
```

giac [B] time = 1.96, size = 5950, normalized size = 39.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/6*(6*B*b^7*c^2*d^2*f^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 12*B*a
*b^6*c*d^3*f^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*B*a^2*b^5*d^4*
f^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 6*B*b^7*c^3*d*f*g*e^4*log(-
b*e + (b*x*e + a*e)*d/(d*x + c)) + 6*B*a*b^6*c^2*d^2*f*g*e^4*log(-b*e + (b*
x*e + a*e)*d/(d*x + c)) + 6*B*a^2*b^5*c*d^3*f*g*e^4*log(-b*e + (b*x*e + a*e
)*d/(d*x + c)) - 6*B*a^3*b^4*d^4*f*g*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x +
```

```
c)) + 2*B*b^7*c^4*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 2*B*a*b^6
*c^3*d*g^2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 2*B*a^3*b^4*c*d^3*g^
2*e^4*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 2*B*a^4*b^3*d^4*g^2*e^4*log(-
b*e + (b*x*e + a*e)*d/(d*x + c)) - 18*(b*x*e + a*e)*B*b^6*c^2*d^3*f^2*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 36*(b*x*e + a*e)*B*a*b^5*c
*d^4*f^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 18*(b*x*e +
a*e)*B*a^2*b^4*d^5*f^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
+ 18*(b*x*e + a*e)*B*b^6*c^3*d^2*f*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x +
c))/(d*x + c) - 18*(b*x*e + a*e)*B*a*b^5*c^2*d^3*f*g*e^3*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c) - 18*(b*x*e + a*e)*B*a^2*b^4*c*d^4*f*g*e^3*lo
g(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 18*(b*x*e + a*e)*B*a^3*b^3*
d^5*f*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 6*(b*x*e + a*
e)*B*b^6*c^4*d*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 6*
(b*x*e + a*e)*B*a*b^5*c^3*d^2*g^2*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c))
/(d*x + c) + 6*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g^2*e^3*log(-b*e + (b*x*e + a*
e)*d/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)*B*a^4*b^2*d^5*g^2*e^3*log(-b*e
+ (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 18*(b*x*e + a*e)^2*B*b^5*c^2*d^4*f
^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 36*(b*x*e + a*e)
^2*B*a*b^4*c*d^5*f^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2
+ 18*(b*x*e + a*e)^2*B*a^2*b^3*d^6*f^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x
+ c))/(d*x + c)^2 - 18*(b*x*e + a*e)^2*B*b^5*c^3*d^3*f*g*e^2*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 18*(b*x*e + a*e)^2*B*a*b^4*c^2*d^4*f*
g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 18*(b*x*e + a*e)^
2*B*a^2*b^3*c*d^5*f*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2
 - 18*(b*x*e + a*e)^2*B*a^3*b^2*d^6*f*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*b^5*c^4*d^2*g^2*e^2*log(-b*e + (b*
x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 6*(b*x*e + a*e)^2*B*a*b^4*c^3*d^3*g^2
*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 6*(b*x*e + a*e)^2*
B*a^3*b^2*c*d^5*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 +
 6*(b*x*e + a*e)^2*B*a^4*b*d^6*g^2*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c)^2 - 6*(b*x*e + a*e)^3*B*b^4*c^2*d^5*f^2*e*log(-b*e + (b*x*e + a
*e)*d/(d*x + c))/(d*x + c)^3 + 12*(b*x*e + a*e)^3*B*a*b^3*c*d^6*f^2*e*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 6*(b*x*e + a*e)^3*B*a^2*b^2*
d^7*f^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*
e)^3*B*b^4*c^3*d^4*f*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3
- 6*(b*x*e + a*e)^3*B*a*b^3*c^2*d^5*f*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x +
 c))/(d*x + c)^3 - 6*(b*x*e + a*e)^3*B*a^2*b^2*c*d^6*f*g*e*log(-b*e + (b*x*
e + a*e)*d/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*e)^3*B*a^3*b*d^7*f*g*e*log
(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 - 2*(b*x*e + a*e)^3*B*b^4*c^
4*d^3*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^3 + 2*(b*x*e +
a*e)^3*B*a*b^3*c^3*d^4*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c
)^3 + 2*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g^2*e*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c)^3 - 2*(b*x*e + a*e)^3*B*a^4*d^7*g^2*e*log(-b*e + (b*x*e +
a*e)*d/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*e)*B*b^6*c^2*d^3*f^2*e^3*log((
b*x*e + a*e)/(d*x + c))/(d*x + c) - 12*(b*x*e + a*e)*B*a*b^5*c*d^4*f^2*e^3*
log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)*B*a^2*b^4*d^5*f^2*
e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 12*(b*x*e + a*e)*B*a*b^5*c^2*d
^3*f*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 24*(b*x*e + a*e)*B*a^2*
b^4*c*d^4*f*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 12*(b*x*e + a*e)
*B*a^3*b^3*d^5*f*g*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 6*(b*x*e +
a*e)*B*a^2*b^4*c^2*d^3*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 12*
(b*x*e + a*e)*B*a^3*b^3*c*d^4*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x + c
) + 6*(b*x*e + a*e)*B*a^4*b^2*d^5*g^2*e^3*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c) - 12*(b*x*e + a*e)^2*B*b^5*c^2*d^4*f^2*e^2*log((b*x*e + a*e)/(d*x + c
))/(d*x + c)^2 + 24*(b*x*e + a*e)^2*B*a*b^4*c*d^5*f^2*e^2*log((b*x*e + a*e)
/(d*x + c))/(d*x + c)^2 - 12*(b*x*e + a*e)^2*B*a^2*b^3*d^6*f^2*e^2*log((b*x
*e + a*e)/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*b^5*c^3*d^3*f*g*e^2*
log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*a*b^4*c^2*d^
4*f*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 30*(b*x*e + a*e)^2*B*a
```

```
^2*b^3*c*d^5*f*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 18*(b*x*e +
 a*e)^2*B*a^3*b^2*d^6*f*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 6*
(b*x*e + a*e)^2*B*a*b^4*c^3*d^3*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x +
 c)^2 + 6*(b*x*e + a*e)^2*B*a^2*b^3*c^2*d^4*g^2*e^2*log((b*x*e + a*e)/(d*x
+ c))/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*a^3*b^2*c*d^5*g^2*e^2*log((b*x*e +
a*e)/(d*x + c))/(d*x + c)^2 - 6*(b*x*e + a*e)^2*B*a^4*b*d^6*g^2*e^2*log((b*
x*e + a*e)/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^3*B*b^4*c^2*d^5*f^2*e*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 12*(b*x*e + a*e)^3*B*a*b^3*c*d^6*
f^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*e)^3*B*a^2*b^
2*d^7*f^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 - 6*(b*x*e + a*e)^3*B*
b^4*c^3*d^4*f*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 6*(b*x*e + a*e
)^3*B*a*b^3*c^2*d^5*f*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3 + 6*(b*x
*e + a*e)^3*B*a^2*b^2*c*d^6*f*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^3
- 6*(b*x*e + a*e)^3*B*a^3*b*d^7*f*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c
)^3 + 2*(b*x*e + a*e)^3*B*b^4*c^4*d^3*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d
*x + c)^3 - 2*(b*x*e + a*e)^3*B*a*b^3*c^3*d^4*g^2*e*log((b*x*e + a*e)/(d*x
+ c))/(d*x + c)^3 - 2*(b*x*e + a*e)^3*B*a^3*b*c*d^6*g^2*e*log((b*x*e + a*e)
/(d*x + c))/(d*x + c)^3 + 2*(b*x*e + a*e)^3*B*a^4*d^7*g^2*e*log((b*x*e + a*
e)/(d*x + c))/(d*x + c)^3 + 6*A*b^7*c^2*d^2*f^2*e^4 - 12*A*a*b^6*c*d^3*f^2*
e^4 + 6*A*a^2*b^5*d^4*f^2*e^4 - 6*A*b^7*c^3*d*f*g*e^4 - 6*B*b^7*c^3*d*f*g*e
^4 + 6*A*a*b^6*c^2*d^2*f*g*e^4 + 18*B*a*b^6*c^2*d^2*f*g*e^4 + 6*A*a^2*b^5*c
*d^3*f*g*e^4 - 18*B*a^2*b^5*c*d^3*f*g*e^4 - 6*A*a^3*b^4*d^4*f*g*e^4 + 6*B*a
^3*b^4*d^4*f*g*e^4 + 2*A*b^7*c^4*g^2*e^4 + 3*B*b^7*c^4*g^2*e^4 - 2*A*a*b^6*
c^3*d*g^2*e^4 - 6*B*a*b^6*c^3*d*g^2*e^4 - 2*A*a^3*b^4*c*d^3*g^2*e^4 + 6*B*a
^3*b^4*c*d^3*g^2*e^4 + 2*A*a^4*b^3*d^4*g^2*e^4 - 3*B*a^4*b^3*d^4*g^2*e^4 -
12*(b*x*e + a*e)*A*b^6*c^2*d^3*f^2*e^3/(d*x + c) + 24*(b*x*e + a*e)*A*a*b^5
*c*d^4*f^2*e^3/(d*x + c) - 12*(b*x*e + a*e)*A*a^2*b^4*d^5*f^2*e^3/(d*x + c)
 + 18*(b*x*e + a*e)*A*b^6*c^3*d^2*f*g*e^3/(d*x + c) + 12*(b*x*e + a*e)*B*b^
6*c^3*d^2*f*g*e^3/(d*x + c) - 30*(b*x*e + a*e)*A*a*b^5*c^2*d^3*f*g*e^3/(d*x
 + c) - 36*(b*x*e + a*e)*B*a*b^5*c^2*d^3*f*g*e^3/(d*x + c) + 6*(b*x*e + a*e
)*A*a^2*b^4*c*d^4*f*g*e^3/(d*x + c) + 36*(b*x*e + a*e)*B*a^2*b^4*c*d^4*f*g*
e^3/(d*x + c) + 6*(b*x*e + a*e)*A*a^3*b^3*d^5*f*g*e^3/(d*x + c) - 12*(b*x*e
 + a*e)*B*a^3*b^3*d^5*f*g*e^3/(d*x + c) - 6*(b*x*e + a*e)*A*b^6*c^4*d*g^2*e
^3/(d*x + c) - 7*(b*x*e + a*e)*B*b^6*c^4*d*g^2*e^3/(d*x + c) + 6*(b*x*e + a
*e)*A*a*b^5*c^3*d^2*g^2*e^3/(d*x + c) + 16*(b*x*e + a*e)*B*a*b^5*c^3*d^2*g^
2*e^3/(d*x + c) + 6*(b*x*e + a*e)*A*a^2*b^4*c^2*d^3*g^2*e^3/(d*x + c) - 6*(
b*x*e + a*e)*B*a^2*b^4*c^2*d^3*g^2*e^3/(d*x + c) - 6*(b*x*e + a*e)*A*a^3*b^
3*c*d^4*g^2*e^3/(d*x + c) - 8*(b*x*e + a*e)*B*a^3*b^3*c*d^4*g^2*e^3/(d*x +
c) + 5*(b*x*e + a*e)*B*a^4*b^2*d^5*g^2*e^3/(d*x + c) + 6*(b*x*e + a*e)^2*A*
b^5*c^2*d^4*f^2*e^2/(d*x + c)^2 - 12*(b*x*e + a*e)^2*A*a*b^4*c*d^5*f^2*e^2/
(d*x + c)^2 + 6*(b*x*e + a*e)^2*A*a^2*b^3*d^6*f^2*e^2/(d*x + c)^2 - 12*(b*x
*e + a*e)^2*A*b^5*c^3*d^3*f*g*e^2/(d*x + c)^2 - 6*(b*x*e + a*e)^2*B*b^5*c^3
*d^3*f*g*e^2/(d*x + c)^2 + 24*(b*x*e + a*e)^2*A*a*b^4*c^2*d^4*f*g*e^2/(d*x
+ c)^2 + 18*(b*x*e + a*e)^2*B*a*b^4*c^2*d^4*f*g*e^2/(d*x + c)^2 - 12*(b*x*e
 + a*e)^2*A*a^2*b^3*c*d^5*f*g*e^2/(d*x + c)^2 - 18*(b*x*e + a*e)^2*B*a^2*b^
3*c*d^5*f*g*e^2/(d*x + c)^2 + 6*(b*x*e + a*e)^2*B*a^3*b^2*d^6*f*g*e^2/(d*x
+ c)^2 + 6*(b*x*e + a*e)^2*A*b^5*c^4*d^2*g^2*e^2/(d*x + c)^2 + 4*(b*x*e + a
*e)^2*B*b^5*c^4*d^2*g^2*e^2/(d*x + c)^2 - 12*(b*x*e + a*e)^2*A*a*b^4*c^3*d^
3*g^2*e^2/(d*x + c)^2 - 10*(b*x*e + a*e)^2*B*a*b^4*c^3*d^3*g^2*e^2/(d*x + c
)^2 + 6*(b*x*e + a*e)^2*A*a^2*b^3*c^2*d^4*g^2*e^2/(d*x + c)^2 + 6*(b*x*e +
a*e)^2*B*a^2*b^3*c^2*d^4*g^2*e^2/(d*x + c)^2 + 2*(b*x*e + a*e)^2*B*a^3*b^2*
c*d^5*g^2*e^2/(d*x + c)^2 - 2*(b*x*e + a*e)^2*B*a^4*b*d^6*g^2*e^2/(d*x + c)
^2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))
/(b^6*d^3*e^3 - 3*(b*x*e + a*e)*b^5*d^4*e^2/(d*x + c) + 3*(b*x*e + a*e)^2*b
^4*d^5*e/(d*x + c)^2 - (b*x*e + a*e)^3*b^3*d^6/(d*x + c)^3)
```

maple [B] time = 0.16, size = 4406, normalized size = 29.37

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] 1/3/d^3*B*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*c^3*g^2+2/d^2*e^2*A*g^2/
(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*b*c^2*a-1/d*e^3*A*g^2/(1/(d*x+c)*a*d*e-
1/(d*x+c)*b*c*e)^3*a^2*b*c+1/d^2*e*B*g/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^
2*f*b-1/d^3*e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d
*x+c)*b*c*e)^2*c^3*b^2-1/d^3*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)
*a*d*e-1/(d*x+c)*b*c*e)*c^3*g^2*b-1/d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(
1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f^2*b*c+1/d^2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+
c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*g^2*a-1/3/d^3*e^3*B*g^2*ln(b/
d*e+(a*d-b*c)/(d*x+c)/d*e)*b^3/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*c^3-1/d*
e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)
^2*a^2*c-20/3*e^3*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/
(d*x+c)*b*c*e)^3*a^3/(d*x+c)^3*c^3-2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1
/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f^2/(d*x+c)*a*c+1/d^2*e^3*A*g^2/(1/(d*x+c)*
a*d*e-1/(d*x+c)*b*c*e)^3*a*b^2*c^2+1/d^2*e^2*A*g/(1/(d*x+c)*a*d*e-1/(d*x+c)
*b*c*e)^2*b^2*c^2*f-2/d*e*B*g/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*f*a-2/d*e
*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*f*g*a+1/2/d^2*e^2*B*g^2/(1/(d*x+c)*a
*d*e-1/(d*x+c)*b*c*e)^2*a*c^2*b+2/d^2*e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)
*c^2*f*g*b+1/d*B*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*f^2*c-1/3*B*g^2/b
^3*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*a^3-B/b*ln(-b*e+(b/d*e+(a*d-b*c
)/(d*x+c)/d*e)*d)*f^2*a+e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f^2*a+1/3*e^3
*A*g^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*a^3+B*g/b^2*ln(-b*e+(b/d*e+(a*d-
b*c)/(d*x+c)/d*e)*d)*a^2*f+e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a
*d*e-1/(d*x+c)*b*c*e)*f^2*a-1/d^2*B*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d
)*c^2*f*g+1/3*e^3*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/
(d*x+c)*b*c*e)^3*a^3-1/3*e*B*g^2/b^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*a^3+
1/6*e^2*B*g^2/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^3+e^2*A*g/(1/(d*x+c)*
a*d*e-1/(d*x+c)*b*c*e)^2*a^2*f-2/d*e^2*A*g/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e
)^2*b*c*f*a-1/d*e^3*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-
1/(d*x+c)*b*c*e)^3*a^2*b*c+2/d^2*e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/
(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*c^2*b*a+1/d^2*e^3*B*g^2*ln(b/d*e+(a*d-b
*c)/(d*x+c)/d*e)*b^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*c^2*a+1/d^2*e^2*B*
g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*c^2*f
*b^2+d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c
*e)*f^2/(d*x+c)*a^2+1/d^3*e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b^2/(1/
(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*c^5/(d*x+c)^2-2/d^2*e*B*ln(b/d*e+(a*d-b*c)
/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^3*g^2/(d*x+c)*a+4*d*e^2*B
*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^
3*f/(d*x+c)^2*c+1/d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-
1/(d*x+c)*b*c*e)*c^2*g^2/(d*x+c)*a^2-1/d^2*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+
c)/d*e)*b^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*c^4*f/(d*x+c)^2-4/d^2*e^2*B
*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*
c^4/(d*x+c)^2*a-2/d*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*
e-1/(d*x+c)*b*c*e)^2*a*f*b*c-2*d^2*e^3*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e
)/b^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*a^5/(d*x+c)^3*c-d^2*e^2*B*g*ln(b/
d*e+(a*d-b*c)/(d*x+c)/d*e)/b^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^4*f/(d
*x+c)^2+d*e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b^2/(1/(d*x+c)*a*d*e-1/
(d*x+c)*b*c*e)^2*a^4*c/(d*x+c)^2+5/d*e^3*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d
*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*a^2/(d*x+c)^3*c^4*b-2*e*B*ln(b/d*e+
(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*f*g/(d*x+c)*a^
2-2/d^2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*
e)*c^3*f*g/(d*x+c)*b-2/d^2*e^3*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b^2/(1
/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*c^5/(d*x+c)^3*a+4/d*e*B*ln(b/d*e+(a*d-b*c
)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*f*g/(d*x+c)*a+5*d*e^3*
B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3
*a^4/(d*x+c)^3*c^2+1/d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e
-1/(d*x+c)*b*c*e)*f^2/(d*x+c)*c^2*b-6*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*
e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^2*f/(d*x+c)^2*c^2+1/3/d^3*e^3*B*g^
2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b^3/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*c
```

```
^6/(d*x+c)^3+6/d*e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e
-1/(d*x+c)*b*c*e)^2*c^3/(d*x+c)^2*a^2+2/d^2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/
d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*f*g*b+1/3*d^3*e^3*B*g^2*ln(b/d*e
+(a*d-b*c)/(d*x+c)/d*e)/b^3/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*a^6/(d*x+c)
^3-4*e^2*B*g^2*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)
*b*c*e)^2*c^2/(d*x+c)^2*a^3+1/d^3*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d
*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^4*g^2/(d*x+c)*b-2/d*e*B*ln(b/d*e+(a*d-b*c)/(
d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*f*g*a+4/d*e^2*B*g*ln(b/d*e+
(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a*f/(d*x+c)^2*c^
3*b+e*B*g/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*a^2*f-1/d*e*A/(1/(d*x+c)*a*d*
e-1/(d*x+c)*b*c*e)*f^2*b*c+1/d^2*e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*
g^2*a-1/d^3*e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^3*g^2*b+1/d^2*e*B*g^2/(
1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*a-2/3/d^3*e*B*g^2/(1/(d*x+c)*a*d*e-1/(
d*x+c)*b*c*e)*c^3*b-1/d^3*e^2*A*g^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*b^2
*c^3-1/3/d^3*e^3*A*g^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^3*b^3*c^3-1/d*e^2*
A*g^2/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^2*c-1/6/d^3*e^2*B*g^2*b^2/(1/(d
*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*c^3-1/2/d*e^2*B*g^2/(1/(d*x+c)*a*d*e-1/(d*x+
c)*b*c*e)^2*a^2*c+e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-
1/(d*x+c)*b*c*e)^2*a^2*f
```

maxima [**A**] time = 0.64, size = 262, normalized size = 1.75

$$\frac{1}{3}Ag^2x^3+Afgx^2+\Bigg(x\log\bigg(\frac{bex}{dx+c}+\frac{ae}{dx+c}\bigg)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\Bigg)Bf^2+\Bigg(x^2\log\bigg(\frac{bex}{dx+c}+\frac{ae}{dx+c}\bigg)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/3*A*g^2*x^3 + A*f*g*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log
(b*x + a)/b - c*log(d*x + c)/d)*B*f^2 + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x
 + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))
*B*f*g + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x +
a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a
^2*d^2)*x)/(b^2*d^2))*B*g^2 + A*f^2*x
```

mupad [**B**] time = 4.73, size = 356, normalized size = 2.37

$$x^2\left(\frac{3\,A\,a\,d\,g^2+3\,A\,b\,c\,g^2+B\,a\,d\,g^2-B\,b\,c\,g^2+6\,A\,b\,d\,f\,g}{6\,b\,d}-\frac{A\,g^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,b\,d}\right)+\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\,\Big(B\,f^2\,x+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] x^2*((3*A*a*d*g^2 + 3*A*b*c*g^2 + B*a*d*g^2 - B*b*c*g^2 + 6*A*b*d*f*g)/(6*b
*d) - (A*g^2*(3*a*d + 3*b*c))/(6*b*d)) + log((e*(a + b*x))/(c + d*x))*((B*g
^2*x^3)/3 + B*f^2*x + B*f*g*x^2) - x*((((3*A*a*d*g^2 + 3*A*b*c*g^2 + B*a*d*
g^2 - B*b*c*g^2 + 6*A*b*d*f*g)/(3*b*d) - (A*g^2*(3*a*d + 3*b*c))/(3*b*d))*(
3*a*d + 3*b*c))/(3*b*d) - (3*A*a*c*g^2 + 3*A*b*d*f^2 + 6*A*a*d*f*g + 6*A*b*
c*f*g + 3*B*a*d*f*g - 3*B*b*c*f*g)/(3*b*d) + (A*a*c*g^2)/(b*d)) + (log(a +
b*x)*(B*a^3*g^2 + 3*B*a*b^2*f^2 - 3*B*a^2*b*f*g))/(3*b^3) - (log(c + d*x)*(
B*c^3*g^2 + 3*B*c*d^2*f^2 - 3*B*c^2*d*f*g))/(3*d^3) + (A*g^2*x^3)/3
```

sympy [**B**] time = 6.54, size = 658, normalized size = 4.39

$$\frac{Ag^2x^3}{3}+\frac{Ba\left(a^2g^2-3abfg+3b^2f^2\right)\log\Bigg(x+\frac{Ba^3cd^2g^2-3Ba^2bcd^2fg+\frac{Ba^2d^3\left(a^2g^2-3abfg+3b^2f^2\right)}{b}+Bab^2c^3g^2-3Bab^2c^2dfg+6Bab^2cd^2f}{Ba^3d^3g^2-3Ba^2bd^3fg+3Bab^2d^3f^2+Bb^3c^3g^2-3Bb^3c^2dfg+3Bb^3}}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g**2*x**3/3 + B*a*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2)*log(x + (B*a**3*c
*d**2*g**2 - 3*B*a**2*b*c*d**2*f*g + B*a**2*d**3*(a**2*g**2 - 3*a*b*f*g + 3
*b**2*f**2)/b + B*a*b**2*c**3*g**2 - 3*B*a*b**2*c**2*d*f*g + 6*B*a*b**2*c*d
**2*f**2 - B*a*c*d**2*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2))/(B*a**3*d**3*g
**2 - 3*B*a**2*b*d**3*f*g + 3*B*a*b**2*d**3*f**2 + B*b**3*c**3*g**2 - 3*B*b
**3*c**2*d*f*g + 3*B*b**3*c*d**2*f**2))/(3*b**3) - B*c*(c**2*g**2 - 3*c*d*f
*g + 3*d**2*f**2)*log(x + (B*a**3*c*d**2*g**2 - 3*B*a**2*b*c*d**2*f*g + B*a
*b**2*c**3*g**2 - 3*B*a*b**2*c**2*d*f*g + 6*B*a*b**2*c*d**2*f**2 - B*a*b**2
*c*(c**2*g**2 - 3*c*d*f*g + 3*d**2*f**2) + B*b**3*c**2*(c**2*g**2 - 3*c*d*f
*g + 3*d**2*f**2)/d)/(B*a**3*d**3*g**2 - 3*B*a**2*b*d**3*f*g + 3*B*a*b**2*d
**3*f**2 + B*b**3*c**3*g**2 - 3*B*b**3*c**2*d*f*g + 3*B*b**3*c*d**2*f**2))/
(3*d**3) + x**2*(A*f*g + B*a*g**2/(6*b) - B*c*g**2/(6*d)) + x*(A*f**2 - B*a
**2*g**2/(3*b**2) + B*a*f*g/b + B*c**2*g**2/(3*d**2) - B*c*f*g/d) + (B*f**2
*x + B*f*g*x**2 + B*g**2*x**3/3)*log(e*(a + b*x)/(c + d*x))
```

3.233 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=109

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgx(bc-ad)}{2bd}+\frac{B(df-cg)^2\log(c+dx)}{2d^2g}$$

```
[Out] -1/2*B*(-a*d+b*c)*g*x/b/d-1/2*B*(-a*g+b*f)^2*ln(b*x+a)/b^2/g+1/2*(g*x+f)^2*
(A+B*ln(e*(b*x+a)/(d*x+c)))/g+1/2*B*(-c*g+d*f)^2*ln(d*x+c)/d^2/g
```

Rubi [A] time = 0.10, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.120$, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgx(bc-ad)}{2bd}+\frac{B(df-cg)^2\log(c+dx)}{2d^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*x)/(2*b*d) - (B*(b*f - a*g)^2*Log[a + b*x])/(2*b^2*g) + (
(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*g) + (B*(d*f - c*g)^2*
Log[c + d*x])/(2*d^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx &= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}-\frac{B\int\frac{(bc-ad)(f+gx)^2}{(a+bx)(c+dx)}dx}{2g}\\
&= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}-\frac{(B(bc-ad))\int\frac{(f+gx)^2}{(a+bx)(c+dx)}dx}{2g}\\
&= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}-\frac{(B(bc-ad))\int\left(\frac{g^2}{bd}+\frac{(bf-ag)^2}{b(bc-ad)(a+bx)}+\right.}{2g}\\
&= -\frac{B(bc-ad)gx}{2bd}-\frac{B(bf-ag)^2\log(a+bx)}{2b^2g}+\frac{(f+gx)^2\left(A+B\log\left(\right.\right.}{2g}
\end{aligned}
$$

Mathematica [**A**] time = 0.11, size = 114, normalized size = 1.05

$$
\frac{b\left(d\left(Bg^2x(ad-bc)+Abd(f+gx)^2\right)+bBd^2(f+gx)^2\log\left(\frac{e(a+bx)}{c+dx}\right)+bB(df-cg)^2\log(c+dx)\right)-Bd^2(bf-ag)^2}{2b^2d^2g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (-(B*d^2*(b*f - a*g)^2*Log[a + b*x]) + b*(d*(B*(-(b*c) + a*d)*g^2*x + A*b*d
*(f + g*x)^2) + b*B*d^2*(f + g*x)^2*Log[(e*(a + b*x))/(c + d*x)] + b*B*(d*f
 - c*g)^2*Log[c + d*x]))/(2*b^2*d^2*g)
```

fricas [**A**] time = 0.69, size = 150, normalized size = 1.38

$$
\frac{Ab^2d^2gx^2+\left(2\,Ab^2d^2f-\left(Bb^2cd-Babd^2\right)g\right)x+\left(2\,Babd^2f-Ba^2d^2g\right)\log\left(bx+a\right)-\left(2\,Bb^2cdf-Bb^2c^2g\right)\log\left(dx\right.}{2\,b^2d^2}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + (2*A*b^2*d^2*f - (B*b^2*c*d - B*a*b*d^2)*g)*x + (2*B
*a*b*d^2*f - B*a^2*d^2*g)*log(b*x + a) - (2*B*b^2*c*d*f - B*b^2*c^2*g)*log(
d*x + c) + (B*b^2*d^2*g*x^2 + 2*B*b^2*d^2*f*x)*log((b*e*x + a*e)/(d*x + c))
)/(b^2*d^2)
```

giac [**B**] time = 1.06, size = 2355, normalized size = 21.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/2*(2*B*b^5*c^2*d*f*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 4*B*a*b^4*
c*d^2*f*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) + 2*B*a^2*b^3*d^3*f*e^3*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c)) - B*b^5*c^3*g*e^3*log(-b*e + (b*x*e +
a*e)*d/(d*x + c)) + B*a*b^4*c^2*d*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c
)) + B*a^2*b^3*c*d^2*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - B*a^3*b^
2*d^3*g*e^3*log(-b*e + (b*x*e + a*e)*d/(d*x + c)) - 4*(b*x*e + a*e)*B*b^4*c
^2*d^2*f*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 8*(b*x*e + a
*e)*B*a*b^3*c*d^3*f*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) - 4
*(b*x*e + a*e)*B*a^2*b^2*d^4*f*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d
```

```
*x + c) + 2*(b*x*e + a*e)*B*b^4*c^3*d*g*e^2*log(-b*e + (b*x*e + a*e)*d/(d*x
 + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a*b^3*c^2*d^2*g*e^2*log(-b*e + (b*x*e
+ a*e)*d/(d*x + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a^2*b^2*c*d^3*g*e^2*log(-
b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)*B*a^3*b*d^4*g*
e^2*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)^2*B*b
^3*c^2*d^3*f*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - 4*(b*x*e
 + a*e)^2*B*a*b^2*c*d^4*f*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)
^2 + 2*(b*x*e + a*e)^2*B*a^2*b*d^5*f*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c)
)/(d*x + c)^2 - (b*x*e + a*e)^2*B*b^3*c^3*d^2*g*e*log(-b*e + (b*x*e + a*e)*
d/(d*x + c))/(d*x + c)^2 + (b*x*e + a*e)^2*B*a*b^2*c^2*d^3*g*e*log(-b*e + (
b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + (b*x*e + a*e)^2*B*a^2*b*c*d^4*g*e*l
og(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 - (b*x*e + a*e)^2*B*a^3*d^
5*g*e*log(-b*e + (b*x*e + a*e)*d/(d*x + c))/(d*x + c)^2 + 2*(b*x*e + a*e)*B
*b^4*c^2*d^2*f*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 4*(b*x*e + a*e)
*B*a*b^3*c*d^3*f*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*(b*x*e + a*
e)*B*a^2*b^2*d^4*f*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(b*x*e +
a*e)*B*a*b^3*c^2*d^2*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 4*(b*x*
e + a*e)*B*a^2*b^2*c*d^3*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(
b*x*e + a*e)*B*a^3*b*d^4*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(
b*x*e + a*e)^2*B*b^3*c^2*d^3*f*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 +
 4*(b*x*e + a*e)^2*B*a*b^2*c*d^4*f*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
^2 - 2*(b*x*e + a*e)^2*B*a^2*b*d^5*f*e*log((b*x*e + a*e)/(d*x + c))/(d*x +
c)^2 + (b*x*e + a*e)^2*B*b^3*c^3*d^2*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x
+ c)^2 - (b*x*e + a*e)^2*B*a*b^2*c^2*d^3*g*e*log((b*x*e + a*e)/(d*x + c))/(
d*x + c)^2 - (b*x*e + a*e)^2*B*a^2*b*c*d^4*g*e*log((b*x*e + a*e)/(d*x + c))
/(d*x + c)^2 + (b*x*e + a*e)^2*B*a^3*d^5*g*e*log((b*x*e + a*e)/(d*x + c))/(
d*x + c)^2 + 2*A*b^5*c^2*d*f*e^3 - 4*A*a*b^4*c*d^2*f*e^3 + 2*A*a^2*b^3*d^3*
f*e^3 - A*b^5*c^3*g*e^3 - B*b^5*c^3*g*e^3 + A*a*b^4*c^2*d*g*e^3 + 3*B*a*b^4
*c^2*d*g*e^3 + A*a^2*b^3*c*d^2*g*e^3 - 3*B*a^2*b^3*c*d^2*g*e^3 - A*a^3*b^2*
d^3*g*e^3 + B*a^3*b^2*d^3*g*e^3 - 2*(b*x*e + a*e)*A*b^4*c^2*d^2*f*e^2/(d*x
+ c) + 4*(b*x*e + a*e)*A*a*b^3*c*d^3*f*e^2/(d*x + c) - 2*(b*x*e + a*e)*A*a^
2*b^2*d^4*f*e^2/(d*x + c) + 2*(b*x*e + a*e)*A*b^4*c^3*d*g*e^2/(d*x + c) + (
b*x*e + a*e)*B*b^4*c^3*d*g*e^2/(d*x + c) - 4*(b*x*e + a*e)*A*a*b^3*c^2*d^2*
g*e^2/(d*x + c) - 3*(b*x*e + a*e)*B*a*b^3*c^2*d^2*g*e^2/(d*x + c) + 2*(b*x*
e + a*e)*A*a^2*b^2*c*d^3*g*e^2/(d*x + c) + 3*(b*x*e + a*e)*B*a^2*b^2*c*d^3*
g*e^2/(d*x + c) - (b*x*e + a*e)*B*a^3*b*d^4*g*e^2/(d*x + c))*(b*c/((b*c*e -
 a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/(b^4*d^2*e^2 - 2*
(b*x*e + a*e)*b^3*d^3*e/(d*x + c) + (b*x*e + a*e)^2*b^2*d^4/(d*x + c)^2)
```

maple [B] time = 0.14, size = 1809, normalized size = 16.60

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] -1/2*d^2*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b^2/(1/(d*x+c)*a*d*e-1/(d*
x+c)*b*c*e)^2*a^4/(d*x+c)^2+1/2*B*g/b^2*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*
e)*d)*a^2+e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f*a+1/2*e^2*A*g/(1/(d*x+c)*
a*d*e-1/(d*x+c)*b*c*e)^2*a^2-B/b*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*f
*a-1/2/d^2*B*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*c^2*g+1/d*B*ln(-b*e+(
b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*f*c-1/d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)
/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f*b*c-3*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+
c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^2/(d*x+c)^2*c^2+2/d*e*B*ln(b/
d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*g/(d*x+c)*
a+d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)
*f/(d*x+c)*a^2-1/2/d^2*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b^2/(1/(d*x+
c)*a*d*e-1/(d*x+c)*b*c*e)^2*c^4/(d*x+c)^2-1/d*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d
*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a*b*c+1/d*e*B*ln(b/d*e+(a*d-
b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f/(d*x+c)*c^2*b-e*B*ln(
```

```
b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*g/(d*x+c
)*a^2+1/2/d^2*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*b^2/(1/(d*x+c)*a*d*e-
1/(d*x+c)*b*c*e)^2*c^2+1/d^2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)
*a*d*e-1/(d*x+c)*b*c*e)*c^2*g*b-1/d^2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(
1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^3*g/(d*x+c)*b+e*B*ln(b/d*e+(a*d-b*c)/(d*
x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f*a+1/2*e^2*B*g*ln(b/d*e+(a*d-b
*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^2+1/2*e*B*g/b/(1/(d*
x+c)*a*d*e-1/(d*x+c)*b*c*e)*a^2-1/d*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/
(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*g*a-2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/
(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f/(d*x+c)*a*c-1/d*e^2*A*g/(1/(d*x+c)*a*d*
e-1/(d*x+c)*b*c*e)^2*b*c*a+2*d*e^2*B*g*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1
/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a^3/(d*x+c)^2*c+2/d*e^2*B*g*ln(b/d*e+(a*d
-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)^2*a/(d*x+c)^2*c^3*b+1/
2/d^2*e*B*g/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c^2*b+1/d^2*e*A/(1/(d*x+c)*a*
d*e-1/(d*x+c)*b*c*e)*c^2*g*b-1/d*e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*c*g*
a-1/d*e*A/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)*f*b*c+1/2/d^2*e^2*A*g/(1/(d*x+c
)*a*d*e-1/(d*x+c)*b*c*e)^2*b^2*c^2-1/d*e*B*g/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c
*e)*c*a
```

maxima [**A**] time = 0.91, size = 140, normalized size = 1.28

$$\frac{1}{2}\,Agx^2+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)Bf+\frac{1}{2}\left(x^2\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log(b}{b^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/2*A*g*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b -
c*log(d*x + c)/d)*B*f + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2
*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*g + A*f*x
```

mupad [**B**] time = 4.24, size = 144, normalized size = 1.32

$$\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\left(\frac{B\,g\,x^2}{2}+B\,f\,x\right)+x\left(\frac{2\,A\,a\,d\,g+2\,A\,b\,c\,g+2\,A\,b\,d\,f+B\,a\,d\,g-B\,b\,c\,g}{2\,b\,d}-\frac{A\,g\,(2\,a\,d+2\,b\,c)}{2\,b\,d}\right)-\frac{\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] log((e*(a + b*x))/(c + d*x))*(B*f*x + (B*g*x^2)/2) + x*((2*A*a*d*g + 2*A*b*
c*g + 2*A*b*d*f + B*a*d*g - B*b*c*g)/(2*b*d) - (A*g*(2*a*d + 2*b*c))/(2*b*d
)) - (log(a + b*x)*(B*a^2*g - 2*B*a*b*f))/(2*b^2) + (log(c + d*x)*(B*c^2*g
- 2*B*c*d*f))/(2*d^2) + (A*g*x^2)/2
```

sympy [**B**] time = 3.01, size = 318, normalized size = 2.92

$$\frac{Agx^2}{2}-\frac{Ba\left(ag-2bf\right)\log\left(x+\frac{Ba^2cdg+\frac{Ba^2d^2\left(ag-2bf\right)}{b}+Babc^2g-4Babcdf-Bacd\left(ag-2bf\right)}{Ba^2d^2g-2Babd^2f+Bb^2c^2g-2Bb^2cdf}\right)}{2b^2}+\frac{Bc\left(cg-2df\right)\log\left(x+\frac{Ba^2cdg+Babc^2g}{Ba^2d^2}\right.}{2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g*x**2/2 - B*a*(a*g - 2*b*f)*log(x + (B*a**2*c*d*g + B*a**2*d**2*(a*g - 2
*b*f)/b + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*c*d*(a*g - 2*b*f))/(B*a**2*d**
2*g - 2*B*a*b*d**2*f + B*b**2*c**2*g - 2*B*b**2*c*d*f))/(2*b**2) + B*c*(c*g
 - 2*d*f)*log(x + (B*a**2*c*d*g + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*b*c*(c
*g - 2*d*f) + B*b**2*c**2*(c*g - 2*d*f)/d)/(B*a**2*d**2*g - 2*B*a*b*d**2*f
+ B*b**2*c**2*g - 2*B*b**2*c*d*f))/(2*d**2) + x*(A*f + B*a*g/(2*b) - B*c*g/
(2*d)) + (B*f*x + B*g*x**2/2)*log(e*(a + b*x)/(c + d*x))
```

3.234 $\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=52

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x+B*(b*x+a)*ln(e*(b*x+a)/(d*x+c))/b-B*(-a*d+b*c)*ln(d*x+c)/b/d
```

Rubi [A] time = 0.03, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[(e*(a + b*x))/(c + d*x)],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/b - (B*(b*c - a*d)*Log[c +
 d*x])/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rubi steps

$$\begin{aligned}\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx &= Ax+B\int \log\left(\frac{e(a+bx)}{c+dx}\right)\,dx\\ &= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{(B(bc-ad))\int \frac{1}{c+dx}\,dx}{b}\\ &= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}\end{aligned}$$

Mathematica [A] time = 0.01, size = 52, normalized size = 1.00

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[(e*(a + b*x))/(c + d*x)],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/b - (B*(b*c - a*d)*Log[c +
 d*x])/(b*d)
```

fricas [A] time = 1.32, size = 56, normalized size = 1.08

$$\frac{Bbdx\log\left(\frac{bex+ae}{dx+c}\right) + Abdx + Bad\log\left(bx+a\right) - Bbc\log\left(dx+c\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)/(d*x+c)),x, algorithm="fricas")
```

```
[Out] (B*b*d*x*log((b*e*x + a*e)/(d*x + c)) + A*b*d*x + B*a*d*log(b*x + a) - B*b*
c*log(d*x + c))/(b*d)
```

giac [B] time = 0.52, size = 427, normalized size = 8.21

$$-\left(\left(b^2c^2e^2 - 2\,abcde^2 + a^2d^2e^2\right)\left(\frac{e^{(-1)}\log\left(\frac{|bxe+ae|}{|dx+c|}\right)}{bd} - \frac{e^{(-1)}\log\left(\left|-be + \frac{(bxe+ae)d}{dx+c}\right|\right)}{bd}\right) - \frac{\left(b^2c^2e^2 - 2\,abcde^2 + a^2d^2e^2\right)}{\left(be - \right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)/(d*x+c)),x, algorithm="giac")
```

```
[Out] -((b^2*c^2*e^2 - 2*a*b*c*d*e^2 + a^2*d^2*e^2)*(e^(-1)*log(abs(b*x*e + a*e)/
abs(d*x + c))/(b*d) - e^(-1)*log(abs(-b*e + (b*x*e + a*e)*d/(d*x + c)))/(b*
d)) - (b^2*c^2*e^2 - 2*a*b*c*d*e^2 + a^2*d^2*e^2)*log((a - b*(a/(b*c - a*d)
 - (b*x*e + a*e)*c/((b*c*e - a*d*e)*(d*x + c))))/(b/(b*c - a*d) - (b*x*e + a
*e)*d/((b*c*e - a*d*e)*(d*x + c))))*e/(c - d*(a/(b*c - a*d) - (b*x*e + a*e)
*c/((b*c*e - a*d*e)*(d*x + c)))/(b/(b*c - a*d) - (b*x*e + a*e)*d/((b*c*e -
a*d*e)*(d*x + c)))))/((b*e - (b*x*e + a*e)*d/(d*x + c))*d))*B*(b*c/((b*c*e
- a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d))) + A*x
```

maple [B] time = 0.13, size = 418, normalized size = 8.04

$$\frac{B\,a^2de\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{\left(\frac{ade}{dx+c}-\frac{bce}{dx+c}\right)(dx+c)\,b} - \frac{2Bace\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{\left(\frac{ade}{dx+c}-\frac{bce}{dx+c}\right)(dx+c)} + \frac{Bb\,c^2e\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{\left(\frac{ade}{dx+c}-\frac{bce}{dx+c}\right)(dx+c)\,d} + \frac{Bae\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{\frac{ade}{dx+c}-\frac{bce}{dx+c}} - \frac{Bbce\ln\left(\frac{be}{d}+\right.}{\left(\frac{ade}{dx+c}-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(B*ln((b*x+a)/(d*x+c)*e)+A,x)
```

```
[Out] A*x-B/b*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*a+B*ln(-b*e+(b/d*e+(a*d-b*
c)/(d*x+c)/d*e)*d)/d*c+e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e
-1/(d*x+c)*b*c*e)*a-e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d*x+c)*a*d*e-1/
(d*x+c)*b*c*e)/d*b*c+e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b/(1/(d*x+c)*a*d*e
-1/(d*x+c)*b*c*e)/(d*x+c)*a^2*d-2*e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(1/(d
*x+c)*a*d*e-1/(d*x+c)*b*c*e)/(d*x+c)*a*c+e*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e
)/(1/(d*x+c)*a*d*e-1/(d*x+c)*b*c*e)/d/(d*x+c)*c^2*b
```

maxima [A] time = 0.62, size = 54, normalized size = 1.04

$$\left(x\log\left(\frac{(bx+a)e}{dx+c}\right) + \frac{\frac{ae\log(bx+a)}{b} - \frac{ce\log(dx+c)}{d}}{e}\right)B + Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)/(d*x+c)),x, algorithm="maxima")
```

```
[Out] (x*log((b*x + a)*e/(d*x + c)) + (a*e*log(b*x + a)/b - c*e*log(d*x + c)/d)/e
)*B + A*x
```

mupad [B] time = 4.12, size = 47, normalized size = 0.90

$$A\,x+B\,x\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)+\frac{B\,a\,\ln\left(a+b\,x\right)}{b}-\frac{B\,c\,\ln\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A + B*log((e*(a + b*x))/(c + d*x)),x)
```

```
[Out] A*x + B*x*log((e*(a + b*x))/(c + d*x)) + (B*a*log(a + b*x))/b - (B*c*log(c
+ d*x))/d
```

sympy [A] time = 1.00, size = 83, normalized size = 1.60

$$Ax+\frac{Ba\log\left(x+\frac{\frac{Ba^2d}{b}+Bac}{Bad+Bbc}\right)}{b}-\frac{Bc\log\left(x+\frac{Bac+\frac{Bbc^2}{d}}{Bad+Bbc}\right)}{d}+Bx\log\left(\frac{e\,(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*(b*x+a)/(d*x+c)),x)
```

```
[Out] A*x + B*a*log(x + (B*a**2*d/b + B*a*c)/(B*a*d + B*b*c))/b - B*c*log(x + (B*
a*c + B*b*c**2/d)/(B*a*d + B*b*c))/d + B*x*log(e*(a + b*x)/(c + d*x))
```

3.235 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{f+gx}\,dx$

Optimal. Leaf size=140

$$\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}-\frac{B\mathrm{Li}_2\left(\frac{b(f+gx)}{bf-ag}\right)}{g}-\frac{B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}+\frac{B\mathrm{Li}_2\left(\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{B\log(f+gx)\,\mathrm{l}}{g}$$

```
[Out] -B*ln(-g*(b*x+a)/(-a*g+b*f))*ln(g*x+f)/g+(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(g*x
+f)/g+B*ln(-g*(d*x+c)/(-c*g+d*f))*ln(g*x+f)/g-B*polylog(2,b*(g*x+f)/(-a*g+b
*f))/g+B*polylog(2,d*(g*x+f)/(-c*g+d*f))/g
```

Rubi [A] time = 0.25, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2524, 12, 2418, 2394, 2393, 2391}

$$-\frac{B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}-\frac{B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right.}{g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x),x]
```

```
[Out] -((B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g) + ((A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[f + g*x])/g + (B*Log[-((g*(c + d*x))/(d*f - c*g))]
*Log[f + g*x])/g - (B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (B*PolyLog
[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{f+gx}\,dx &= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}-\frac{B\int\frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(f+gx)}{e(a+bx)}\,dx}{g}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}-\frac{B\int\frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(f+gx)}{a+bx}\,dx}{eg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}-\frac{B\int\left(\frac{be\log(f+gx)}{a+bx}-\frac{de\log(f+gx)}{c+dx}\right)dx}{eg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}-\frac{(bB)\int\frac{\log(f+gx)}{a+bx}\,dx}{g}+\frac{(Bd)\int\frac{\log(f+gx)}{c+dx}\,dx}{g}\\
&= -\frac{B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g}+\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}+\frac{B\log\Big(-\frac{g(c+}{df-}}{}\\
&= -\frac{B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g}+\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}+\frac{B\log\Big(-\frac{g(c+}{df-}}{}\\
&= -\frac{B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g}+\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g}+\frac{B\log\Big(-\frac{g(c+}{df-}}{}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 115, normalized size = 0.82

$$\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)-B\log\left(\frac{g(a+bx)}{ag-bf}\right)+A+B\log\left(\frac{g(c+dx)}{cg-df}\right)\right)-B\text{Li}_2\left(\frac{b(f+gx)}{bf-ag}\right)+B\text{Li}_2\left(\frac{d(f+gx)}{df-cg}\right)}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x),x]
```

```
[Out] ((A - B*Log[(g*(a + b*x))/(-(b*f) + a*g)] + B*Log[(e*(a + b*x))/(c + d*x)]
+ B*Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] - B*PolyLog[2, (b*(f +
g*x))/(b*f - a*g)] + B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

fricas [F] time = 1.88, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B\log\left(\frac{bex+ae}{dx+c}\right)+A}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*e*x + a*e)/(d*x + c)) + A)/(g*x + f), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 0.20, size = 1400, normalized size = 10.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)/(g*x+f),x)
```

```
[Out] -d*A/g/(a*d-b*c)*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*a+A/g/(a*d-b*c)*l
n(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*b*c+d*A/g/(a*d-b*c)*ln((b/d*e+(a*d-
b*c)/(d*x+c)/d*e)*c*g-d*(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*f-a*e*g+b*e*f)*a-A/g/
(a*d-b*c)*ln((b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c*g-d*(b/d*e+(a*d-b*c)/(d*x+c)/d
*e)*f-a*e*g+b*e*f)*b*c-d*B/g/(a*d-b*c)*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c
)/d*e)*d)/b/e)*a+B/g/(a*d-b*c)*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d
)/b/e)*b*c-d*B/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-(-b*e+(b/d*e
+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*a+B/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/
d*e)*ln(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*b*c+d*B/(a*d-b*c)*dilo
g(((c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e)-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*
g-d*f)*c*a-B/(a*d-b*c)*dilog(((c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e)-a*e*g
+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c^2*b-d^2*B/g/(a*d-b*c)*dilog(((c*g-d*f)*
(b/d*e+(a*d-b*c)/(d*x+c)/d*e)-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*f*a+d*
B/g/(a*d-b*c)*dilog(((c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e)-a*e*g+b*e*f)/(
-a*e*g+b*e*f))/(c*g-d*f)*f*b*c+d*B/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e
)*ln(((c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e)-a*e*g+b*e*f)/(-a*e*g+b*e*f))/
(c*g-d*f)*c*a-B/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(((c*g-d*f)*(b/
d*e+(a*d-b*c)/(d*x+c)/d*e)-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c^2*b-d^2
*B/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(((c*g-d*f)*(b/d*e+(a*d-b*
c)/(d*x+c)/d*e)-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*f*a+d*B/g/(a*d-b*c)*
ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(((c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e)
-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*f*b*c
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$-B\int -\frac{\log\left(bx+a\right)-\log\left(dx+c\right)+\log(e)}{gx+f}\,dx+\frac{A\log\left(gx+f\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(log(b*x + a) - log(d*x + c) + log(e))/(g*x + f), x) + A*log(
g*x + f)/g
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)}{f+g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(f + g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))/(f + g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A + B\log\left(\frac{ae}{c+dx} + \frac{bex}{c+dx}\right)}{f + gx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f),x)
```

```
[Out] Integral((A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x)))/(f + g*x), x)
```

3.236 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^2}\,dx$

Optimal. Leaf size=87

$$\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{(f+gx)(bf-ag)}+\frac{B(bc-ad)\log\left(\frac{f+gx}{c+dx}\right)}{(bf-ag)(df-cg)}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*g+b*f)/(g*x+f)+B*(-a*d+b*c)*ln((g*x
+f)/(d*x+c))/(-a*g+b*f)/(-c*g+d*f)
```

Rubi [A] time = 0.11, antiderivative size = 113, normalized size of antiderivative = 1.30, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{g(f+gx)}+\frac{B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}+\frac{bB\log(a+bx)}{g(bf-ag)}-\frac{Bd\log(c+dx)}{g(df-cg)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^2,x]
```

```
[Out] (b*B*Log[a + b*x])/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(
g*(f + g*x)) - (B*d*Log[c + d*x])/(g*(d*f - c*g)) + (B*(b*c - a*d)*Log[f +
g*x])/((b*f - a*g)*(d*f - c*g))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}+\frac{B\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)}\,dx}{g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)}\,dx}{g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}+\frac{(B(bc-ad))\int\left(\frac{b^2}{(bc-ad)(bf-ag)(a+bx)}+\frac{d^2}{(bc-ad)(-df+cg)(c+dx)}+\right.}{g}\\ &= \frac{bB\log(a+bx)}{g(bf-ag)}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}-\frac{Bd\log(c+dx)}{g(df-cg)}+\frac{B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}\end{aligned}$$

Mathematica [A] time = 0.13, size = 105, normalized size = 1.21

$$\frac{\frac{B(b\log(a+bx)(df-cg)+\log(c+dx)(adg-bdf)+g(bc-ad)\log(f+gx))}{(bf-ag)(df-cg)}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{f+gx}}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)) + (B*(b*(d*f - c*g)*Log[
a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]))/(
(b*f - a*g)*(d*f - c*g)))/g
```

fricas [B] time = 10.90, size = 255, normalized size = 2.93

$$-\frac{Abdf^2+Aacg^2-(Abc+Aad)fg-\left(Bbdf^2-Bbcfg+\left(Bbdfg-Bbcg^2\right)x\right)\log(bx+a)+\left(Bbdf^2-Badfg\right.}{bdf^3g+acfg^3-(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] -(A*b*d*f^2 + A*a*c*g^2 - (A*b*c + A*a*d)*f*g - (B*b*d*f^2 - B*b*c*f*g + (B
*b*d*f*g - B*b*c*g^2)*x)*log(b*x + a) + (B*b*d*f^2 - B*a*d*f*g + (B*b*d*f*g
 - B*a*d*g^2)*x)*log(d*x + c) - ((B*b*c - B*a*d)*g^2*x + (B*b*c - B*a*d)*f*
g)*log(g*x + f) + (B*b*d*f^2 + B*a*c*g^2 - (B*b*c + B*a*d)*f*g)*log((b*e*x
+ a*e)/(d*x + c)))/(b*d*f^3*g + a*c*f*g^3 - (b*c + a*d)*f^2*g^2 + (b*d*f^2*
g^2 + a*c*g^4 - (b*c + a*d)*f*g^3)*x)
```

giac [B] time = 1.11, size = 1537, normalized size = 17.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] (B*b^3*c^2*f*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e
+ a*e)*c*g/(d*x + c)) - 2*B*a*b^2*c*d*f*e^2*log(-b*f*e + a*g*e + (b*x*e + a
*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) + B*a^2*b*d^2*f*e^2*log(-b
*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) -
 B*a*b^2*c^2*g*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*
e + a*e)*c*g/(d*x + c)) + 2*B*a^2*b*c*d*g*e^2*log(-b*f*e + a*g*e + (b*x*e +
```

```
 a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) - B*a^3*d^2*g*e^2*log(-b
*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) -
 (b*x*e + a*e)*B*b^2*c^2*d*f*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x
+ c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)*B*a*b*c*d^2
*f*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(
d*x + c))/(d*x + c) - (b*x*e + a*e)*B*a^2*d^3*f*e*log(-b*f*e + a*g*e + (b*x
*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) + (b*x*e +
 a*e)*B*b^2*c^3*g*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x
*e + a*e)*c*g/(d*x + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a*b*c^2*d*g*e*log(-b
*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(
d*x + c) + (b*x*e + a*e)*B*a^2*c*d^2*g*e*log(-b*f*e + a*g*e + (b*x*e + a*e)
*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) + (b*x*e + a*e)*B*b
^2*c^2*d*f*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a*b
*c*d^2*f*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + (b*x*e + a*e)*B*a^2*d^3
*f*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - (b*x*e + a*e)*B*b^2*c^3*g*e*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)*B*a*b*c^2*d*g*e*log
((b*x*e + a*e)/(d*x + c))/(d*x + c) - (b*x*e + a*e)*B*a^2*c*d^2*g*e*log((b*
x*e + a*e)/(d*x + c))/(d*x + c) + A*b^3*c^2*f*e^2 - 2*A*a*b^2*c*d*f*e^2 + A
*a^2*b*d^2*f*e^2 - A*a*b^2*c^2*g*e^2 + 2*A*a^2*b*c*d*g*e^2 - A*a^3*d^2*g*e^
2)*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*d*e)*(b*c - a*d)))/
(b^2*d*f^3*e - b^2*c*f^2*g*e - 2*a*b*d*f^2*g*e + 2*a*b*c*f*g^2*e + a^2*d*f*
g^2*e - a^2*c*g^3*e - (b*x*e + a*e)*b*d^2*f^3/(d*x + c) + 2*(b*x*e + a*e)*b
*c*d*f^2*g/(d*x + c) + (b*x*e + a*e)*a*d^2*f^2*g/(d*x + c) - (b*x*e + a*e)*
b*c^2*f*g^2/(d*x + c) - 2*(b*x*e + a*e)*a*c*d*f*g^2/(d*x + c) + (b*x*e + a*
e)*a*c^2*g^3/(d*x + c))
```

maple **[B]** time = 0.13, size = 926, normalized size = 10.64

$$\frac{B\,a^{2}de\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{\left(ag-bf\right)\left(\frac{aceg}{dx+c}-\frac{adef}{dx+c}-\frac{b\,c^{2}eg}{(dx+c)d}+\frac{bcef}{dx+c}-aeg+\frac{bceg}{d}\right)(dx+c)}-\frac{2Babce\ln\left(\frac{be}{d}+\frac{(ad-bc)e}{(dx+c)d}\right)}{\left(ag-bf\right)\left(\frac{aceg}{dx+c}-\frac{adef}{dx+c}-\frac{b\,c^{2}eg}{(dx+c)d}+\frac{bcef}{dx+c}-aeg+\frac{bceg}{d}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)/(g*x+f)^2,x)
```

```
[Out] d*e*A/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)*b*c^2*g+e/(d*x
+c)*b*c*f-a*e*g)/(c*g-d*f)*a-e*A/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f
-e/d/(d*x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)/(c*g-d*f)*b*c-d*B/(a*g-b*f)*ln(
-a*e*g+b*e*f+(c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(c*g-d*f)*a+B/(a*g-b*
f)*ln(-a*e*g+b*e*f+(c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(c*g-d*f)*b*c+e
*B*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/(a*g-b*f)/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(
d*x+c)*a*d*f-e/d/(d*x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)*b*a-1/d*e*B*ln(b/d*
e+(a*d-b*c)/(d*x+c)/d*e)/(a*g-b*f)/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d
*f-e/d/(d*x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)*b^2*c+d*e*B*ln(b/d*e+(a*d-b*c
)/(d*x+c)/d*e)/(a*g-b*f)/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*
x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)/(d*x+c)*a^2-2*e*B*ln(b/d*e+(a*d-b*c)/(d
*x+c)/d*e)/(a*g-b*f)/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)
*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)/(d*x+c)*a*b*c+1/d*e*B*ln(b/d*e+(a*d-b*c)/(d
*x+c)/d*e)/(a*g-b*f)/(b/d*e*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)
*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)/(d*x+c)*b^2*c^2
```

maxima **[A]** time = 0.77, size = 138, normalized size = 1.59

$$B\left(\frac{b\log\left(bx+a\right)}{bfg-ag^{2}}-\frac{d\log\left(dx+c\right)}{dfg-cg^{2}}+\frac{(bc-ad)\log\left(gx+f\right)}{bdf^{2}+acg^{2}-(bc+ad)fg}-\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{g^{2}x+fg}\right)-\frac{A}{g^{2}x+fg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] B*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) + (b*c -
 a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b*e*x/(d*x +
 c) + a*e/(d*x + c))/(g^2*x + f*g)) - A/(g^2*x + f*g)
```

mupad **[B]** time = 5.17, size = 166, normalized size = 1.91

$$\frac{B\,d\,\ln(c+d\,x)}{c\,g^2-d\,f\,g}-\frac{B\,\ln\left(\frac{a\,e+b\,e\,x}{c+d\,x}\right)}{x\,g^2+f\,g}-\frac{B\,b\,\ln(a+b\,x)}{a\,g^2-b\,f\,g}-\frac{A}{x\,g^2+f\,g}-\frac{B\,a\,d\,\ln\left(f+g\,x\right)}{a\,c\,g^2+b\,d\,f^2-a\,d\,f\,g-b\,c\,f\,g}+\frac{B\,b\,c\,\ln}{a\,c\,g^2+b\,d\,f^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(f + g*x)^2,x)
```

```
[Out] (B*d*log(c + d*x))/(c*g^2 - d*f*g) - (B*log((a*e + b*e*x)/(c + d*x)))/(f*g
+ g^2*x) - (B*b*log(a + b*x))/(a*g^2 - b*f*g) - A/(f*g + g^2*x) - (B*a*d*lo
g(f + g*x))/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g) + (B*b*c*log(f + g*x))/
(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

3.237 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^3}\,dx$

Optimal. Leaf size=183

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf}{2(bf-ag)^2(df-cg)^2}$$

```
[Out] -1/2*B*(-a*d+b*c)/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)+1/2*b^2*B*ln(b*x+a)/g/(-a*g
+b*f)^2+1/2*(-A-B*ln(e*(b*x+a)/(d*x+c)))/g/(g*x+f)^2-1/2*B*d^2*ln(d*x+c)/g/
(-c*g+d*f)^2+1/2*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*ln(g*x+f)/(-a*g+b*f)^2
/(-c*g+d*f)^2
```

Rubi [A] time = 0.19, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf}{2(bf-ag)^2(df-cg)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^3,x]
```

```
[Out] -(B*(b*c - a*d))/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*Log[a + b*x
])/(2*g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*g*(f + g*x
)^2) - (B*d^2*Log[c + d*x])/(2*g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f -
 b*c*g - a*d*g)*Log[f + g*x])/(2*(b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^3}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2}+\frac{B\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2}+\frac{(B(bc-ad))\int\left(\frac{b^3}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3}{(bc-ad)(-df+cg)^2(c+dx)}+\right.}{2g}\\ &= -\frac{B(bc-ad)}{2(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)}{2g(bf-ag)^2}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2}-\frac{Bd^2\log}{2g(df}\end{aligned}$$

Mathematica [**A**] time = 0.50, size = 169, normalized size = 0.92

$$\frac{B(bc-ad)\left(\frac{b^2\log(a+bx)}{(bc-ad)(bf-ag)^2}+\frac{\frac{d^2\log(c+dx)}{ad-bc}+\frac{g(cg-df)}{(f+gx)(bf-ag)}-\frac{g\log(f+gx)(adg+bcg-2bdf)}{(bf-ag)^2}}{(df-cg)^2}\right)-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{(f+gx)^2}}{2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^3,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^2) + B*(b*c - a*d)*((b^2*
Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + ((g*(-(d*f) + c*g))/((b*f - a*g
)*(f + g*x)) + (d^2*Log[c + d*x])/(-(b*c) + a*d) - (g*(-2*b*d*f + b*c*g + a
*d*g)*Log[f + g*x])/(b*f - a*g)^2)/(d*f - c*g)^2))/(2*g)
```

fricas [**B**] time = 139.54, size = 1017, normalized size = 5.56

$$-\frac{Ab^2d^2f^4+Aa^2c^2g^4-\left((2\,A-B)b^2cd+(2\,A+B)abd^2\right)f^3g+\left((A-B)b^2c^2+4\,Aabcd+(A+B)a^2d^2\right)f^2g^2-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(A*b^2*d^2*f^4 + A*a^2*c^2*g^4 - ((2*A - B)*b^2*c*d + (2*A + B)*a*b*d^
2)*f^3*g + ((A - B)*b^2*c^2 + 4*A*a*b*c*d + (A + B)*a^2*d^2)*f^2*g^2 - ((2*
A - B)*a*b*c^2 + (2*A + B)*a^2*c*d)*f*g^3 + ((B*b^2*c*d - B*a*b*d^2)*f^2*g^
2 - (B*b^2*c^2 - B*a^2*d^2)*f*g^3 + (B*a*b*c^2 - B*a^2*c*d)*g^4)*x - (B*b^2
*d^2*f^4 - 2*B*b^2*c*d*f^3*g + B*b^2*c^2*f^2*g^2 + (B*b^2*d^2*f^2*g^2 - 2*B
*b^2*c*d*f*g^3 + B*b^2*c^2*g^4)*x^2 + 2*(B*b^2*d^2*f^3*g - 2*B*b^2*c*d*f^2*
g^2 + B*b^2*c^2*f*g^3)*x)*log(b*x + a) + (B*b^2*d^2*f^4 - 2*B*a*b*d^2*f^3*g
 + B*a^2*d^2*f^2*g^2 + (B*b^2*d^2*f^2*g^2 - 2*B*a*b*d^2*f*g^3 + B*a^2*d^2*g
^4)*x^2 + 2*(B*b^2*d^2*f^3*g - 2*B*a*b*d^2*f^2*g^2 + B*a^2*d^2*f*g^3)*x)*lo
g(d*x + c) - (2*(B*b^2*c*d - B*a*b*d^2)*f^3*g - (B*b^2*c^2 - B*a^2*d^2)*f^2
*g^2 + (2*(B*b^2*c*d - B*a*b*d^2)*f*g^3 - (B*b^2*c^2 - B*a^2*d^2)*g^4)*x^2
+ 2*(2*(B*b^2*c*d - B*a*b*d^2)*f^2*g^2 - (B*b^2*c^2 - B*a^2*d^2)*f*g^3)*x)*
log(g*x + f) + (B*b^2*d^2*f^4 + B*a^2*c^2*g^4 - 2*(B*b^2*c*d + B*a*b*d^2)*f
^3*g + (B*b^2*c^2 + 4*B*a*b*c*d + B*a^2*d^2)*f^2*g^2 - 2*(B*a*b*c^2 + B*a^2
*c*d)*f*g^3)*log((b*e*x + a*e)/(d*x + c)))/(b^2*d^2*f^6*g + a^2*c^2*f^2*g^5
 - 2*(b^2*c*d + a*b*d^2)*f^5*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^4*g^3
- 2*(a*b*c^2 + a^2*c*d)*f^3*g^4 + (b^2*d^2*f^4*g^3 + a^2*c^2*g^7 - 2*(b^2*c
*d + a*b*d^2)*f^3*g^4 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^5 - 2*(a*b*c^
```

```
2 + a^2*c*d)*f*g^6)*x^2 + 2*(b^2*d^2*f^5*g^2 + a^2*c^2*f*g^6 - 2*(b^2*c*d +
 a*b*d^2)*f^4*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^3*g^4 - 2*(a*b*c^2 +
a^2*c*d)*f^2*g^5)*x)
```

giac [B] time = 2.09, size = 7600, normalized size = 41.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*B*b^5*c^2*d*f^3*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c)
 - (b*x*e + a*e)*c*g/(d*x + c)) - 4*B*a*b^4*c*d^2*f^3*e^3*log(-b*f*e + a*g*
e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) + 2*B*a^2*b^
3*d^3*f^3*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a
*e)*c*g/(d*x + c)) - B*b^5*c^3*f^2*g*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)
*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) - 3*B*a*b^4*c^2*d*f^2*g*e^3*l
og(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x +
c)) + 9*B*a^2*b^3*c*d^2*f^2*g*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d
*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) - 5*B*a^3*b^2*d^3*f^2*g*e^3*log(-b*f
*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) + 2
*B*a*b^4*c^3*f*g^2*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (
b*x*e + a*e)*c*g/(d*x + c)) - 6*B*a^3*b^2*c*d^2*f*g^2*e^3*log(-b*f*e + a*g*
e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) + 4*B*a^4*b*
d^3*f*g^2*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a
*e)*c*g/(d*x + c)) - B*a^2*b^3*c^3*g^3*e^3*log(-b*f*e + a*g*e + (b*x*e + a*
e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) + B*a^3*b^2*c^2*d*g^3*e^3*l
og(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x +
c)) + B*a^4*b*c*d^2*g^3*e^3*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c
) - (b*x*e + a*e)*c*g/(d*x + c)) - B*a^5*d^3*g^3*e^3*log(-b*f*e + a*g*e + (
b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c)) - 4*(b*x*e + a*e)
*B*b^4*c^2*d^2*f^3*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (
b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) + 8*(b*x*e + a*e)*B*a*b^3*c*d^3*f^3*e
^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*
x + c))/(d*x + c) - 4*(b*x*e + a*e)*B*a^2*b^2*d^4*f^3*e^2*log(-b*f*e + a*g*
e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) +
6*(b*x*e + a*e)*B*b^4*c^3*d*f^2*g*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*
f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)*B*a*
b^3*c^2*d^2*f^2*g*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b
*x*e + a*e)*c*g/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)*B*a^2*b^2*c*d^3*f^2*
g*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/
(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)*B*a^3*b*d^4*f^2*g*e^2*log(-b*f*e + a
*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)
 - 2*(b*x*e + a*e)*B*b^4*c^4*f*g^2*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d
*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) - 4*(b*x*e + a*e)*B*a
*b^3*c^3*d*f*g^2*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*
x*e + a*e)*c*g/(d*x + c))/(d*x + c) + 12*(b*x*e + a*e)*B*a^2*b^2*c^2*d^2*f*
g^2*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*
g/(d*x + c))/(d*x + c) - 4*(b*x*e + a*e)*B*a^3*b*c*d^3*f*g^2*e^2*log(-b*f*e
 + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x
+ c) - 2*(b*x*e + a*e)*B*a^4*d^4*f*g^2*e^2*log(-b*f*e + a*g*e + (b*x*e + a*
e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)
*B*a*b^3*c^4*g^3*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*
x*e + a*e)*c*g/(d*x + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a^2*b^2*c^3*d*g^3*e
^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*
x + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a^3*b*c^2*d^2*g^3*e^2*log(-b*f*e + a*
g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)
+ 2*(b*x*e + a*e)*B*a^4*c*d^3*g^3*e^2*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*
f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)^2*B*
b^3*c^2*d^3*f^3*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e
```

```
 + a*e)*c*g/(d*x + c))/(d*x + c)^2 - 4*(b*x*e + a*e)^2*B*a*b^2*c*d^4*f^3*e*
log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x +
 c))/(d*x + c)^2 + 2*(b*x*e + a*e)^2*B*a^2*b*d^5*f^3*e*log(-b*f*e + a*g*e +
 (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 - 5
*(b*x*e + a*e)^2*B*b^3*c^3*d^2*f^2*g*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d
*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 + 9*(b*x*e + a*e)^2
*B*a*b^2*c^2*d^3*f^2*g*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) -
 (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 - 3*(b*x*e + a*e)^2*B*a^2*b*c*d^4
*f^2*g*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c
*g/(d*x + c))/(d*x + c)^2 - (b*x*e + a*e)^2*B*a^3*d^5*f^2*g*e*log(-b*f*e +
a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c
)^2 + 4*(b*x*e + a*e)^2*B*b^3*c^4*d*f*g^2*e*log(-b*f*e + a*g*e + (b*x*e + a
*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 - 6*(b*x*e + a
*e)^2*B*a*b^2*c^3*d^2*f*g^2*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x +
 c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 + 2*(b*x*e + a*e)^2*B*a^3*c*
d^4*f*g^2*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e
)*c*g/(d*x + c))/(d*x + c)^2 - (b*x*e + a*e)^2*B*b^3*c^5*g^3*e*log(-b*f*e +
 a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x +
c)^2 + (b*x*e + a*e)^2*B*a*b^2*c^4*d*g^3*e*log(-b*f*e + a*g*e + (b*x*e + a*
e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 + (b*x*e + a*e)
^2*B*a^2*b*c^3*d^2*g^3*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) -
 (b*x*e + a*e)*c*g/(d*x + c))/(d*x + c)^2 - (b*x*e + a*e)^2*B*a^3*c^2*d^3*g
^3*e*log(-b*f*e + a*g*e + (b*x*e + a*e)*d*f/(d*x + c) - (b*x*e + a*e)*c*g/(
d*x + c))/(d*x + c)^2 + 2*(b*x*e + a*e)*B*b^4*c^2*d^2*f^3*e^2*log((b*x*e +
a*e)/(d*x + c))/(d*x + c) - 4*(b*x*e + a*e)*B*a*b^3*c*d^3*f^3*e^2*log((b*x*
e + a*e)/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)*B*a^2*b^2*d^4*f^3*e^2*log((
b*x*e + a*e)/(d*x + c))/(d*x + c) - 4*(b*x*e + a*e)*B*b^4*c^3*d*f^2*g*e^2*l
og((b*x*e + a*e)/(d*x + c))/(d*x + c) + 6*(b*x*e + a*e)*B*a*b^3*c^2*d^2*f^2
*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(b*x*e + a*e)*B*a^3*b*d^4
*f^2*g*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 2*(b*x*e + a*e)*B*b^4*c
^4*f*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 6*(b*x*e + a*e)*B*a^2
*b^2*c^2*d^2*f*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 4*(b*x*e +
a*e)*B*a^3*b*c*d^3*f*g^2*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) - 2*(b*
x*e + a*e)*B*a*b^3*c^4*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c) + 4*(
b*x*e + a*e)*B*a^2*b^2*c^3*d*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*x + c)
 - 2*(b*x*e + a*e)*B*a^3*b*c^2*d^2*g^3*e^2*log((b*x*e + a*e)/(d*x + c))/(d*
x + c) - 2*(b*x*e + a*e)^2*B*b^3*c^2*d^3*f^3*e*log((b*x*e + a*e)/(d*x + c))
/(d*x + c)^2 + 4*(b*x*e + a*e)^2*B*a*b^2*c*d^4*f^3*e*log((b*x*e + a*e)/(d*x
 + c))/(d*x + c)^2 - 2*(b*x*e + a*e)^2*B*a^2*b*d^5*f^3*e*log((b*x*e + a*e)/
(d*x + c))/(d*x + c)^2 + 5*(b*x*e + a*e)^2*B*b^3*c^3*d^2*f^2*g*e*log((b*x*e
 + a*e)/(d*x + c))/(d*x + c)^2 - 9*(b*x*e + a*e)^2*B*a*b^2*c^2*d^3*f^2*g*e*
log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 3*(b*x*e + a*e)^2*B*a^2*b*c*d^4*
f^2*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + (b*x*e + a*e)^2*B*a^3*d^
5*f^2*g*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 4*(b*x*e + a*e)^2*B*b^
3*c^4*d*f*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 + 6*(b*x*e + a*e)^
2*B*a*b^2*c^3*d^2*f*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 - 2*(b*x
*e + a*e)^2*B*a^3*c*d^4*f*g^2*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 +
(b*x*e + a*e)^2*B*b^3*c^5*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^2 -
(b*x*e + a*e)^2*B*a*b^2*c^4*d*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x + c)^
2 - (b*x*e + a*e)^2*B*a^2*b*c^3*d^2*g^3*e*log((b*x*e + a*e)/(d*x + c))/(d*x
 + c)^2 + (b*x*e + a*e)^2*B*a^3*c^2*d^3*g^3*e*log((b*x*e + a*e)/(d*x + c))/
(d*x + c)^2 + 2*A*b^5*c^2*d*f^3*e^3 - 4*A*a*b^4*c*d^2*f^3*e^3 + 2*A*a^2*b^3
*d^3*f^3*e^3 - A*b^5*c^3*f^2*g*e^3 + B*b^5*c^3*f^2*g*e^3 - 3*A*a*b^4*c^2*d*
f^2*g*e^3 - 3*B*a*b^4*c^2*d*f^2*g*e^3 + 9*A*a^2*b^3*c*d^2*f^2*g*e^3 + 3*B*a
^2*b^3*c*d^2*f^2*g*e^3 - 5*A*a^3*b^2*d^3*f^2*g*e^3 - B*a^3*b^2*d^3*f^2*g*e^
3 + 2*A*a*b^4*c^3*f*g^2*e^3 - 2*B*a*b^4*c^3*f*g^2*e^3 + 6*B*a^2*b^3*c^2*d*f
*g^2*e^3 - 6*A*a^3*b^2*c*d^2*f*g^2*e^3 - 6*B*a^3*b^2*c*d^2*f*g^2*e^3 + 4*A*
a^4*b*d^3*f*g^2*e^3 + 2*B*a^4*b*d^3*f*g^2*e^3 - A*a^2*b^3*c^3*g^3*e^3 + B*a
^2*b^3*c^3*g^3*e^3 + A*a^3*b^2*c^2*d*g^3*e^3 - 3*B*a^3*b^2*c^2*d*g^3*e^3 +
```

```
A*a^4*b*c*d^2*g^3*e^3 + 3*B*a^4*b*c*d^2*g^3*e^3 - A*a^5*d^3*g^3*e^3 - B*a^5
*d^3*g^3*e^3 - 2*(b*x*e + a*e)*A*b^4*c^2*d^2*f^3*e^2/(d*x + c) + 4*(b*x*e +
 a*e)*A*a*b^3*c*d^3*f^3*e^2/(d*x + c) - 2*(b*x*e + a*e)*A*a^2*b^2*d^4*f^3*e
^2/(d*x + c) + 2*(b*x*e + a*e)*A*b^4*c^3*d*f^2*g*e^2/(d*x + c) - (b*x*e + a
*e)*B*b^4*c^3*d*f^2*g*e^2/(d*x + c) + 3*(b*x*e + a*e)*B*a*b^3*c^2*d^2*f^2*g
*e^2/(d*x + c) - 6*(b*x*e + a*e)*A*a^2*b^2*c*d^3*f^2*g*e^2/(d*x + c) - 3*(b
*x*e + a*e)*B*a^2*b^2*c*d^3*f^2*g*e^2/(d*x + c) + 4*(b*x*e + a*e)*A*a^3*b*d
^4*f^2*g*e^2/(d*x + c) + (b*x*e + a*e)*B*a^3*b*d^4*f^2*g*e^2/(d*x + c) + (b
*x*e + a*e)*B*b^4*c^4*f*g^2*e^2/(d*x + c) - 4*(b*x*e + a*e)*A*a*b^3*c^3*d*f
*g^2*e^2/(d*x + c) - 2*(b*x*e + a*e)*B*a*b^3*c^3*d*f*g^2*e^2/(d*x + c) + 6*
(b*x*e + a*e)*A*a^2*b^2*c^2*d^2*f*g^2*e^2/(d*x + c) + 2*(b*x*e + a*e)*B*a^3
*b*c*d^3*f*g^2*e^2/(d*x + c) - 2*(b*x*e + a*e)*A*a^4*d^4*f*g^2*e^2/(d*x + c
) - (b*x*e + a*e)*B*a^4*d^4*f*g^2*e^2/(d*x + c) - (b*x*e + a*e)*B*a*b^3*c^4
*g^3*e^2/(d*x + c) + 2*(b*x*e + a*e)*A*a^2*b^2*c^3*d*g^3*e^2/(d*x + c) + 3*
(b*x*e + a*e)*B*a^2*b^2*c^3*d*g^3*e^2/(d*x + c) - 4*(b*x*e + a*e)*A*a^3*b*c
^2*d^2*g^3*e^2/(d*x + c) - 3*(b*x*e + a*e)*B*a^3*b*c^2*d^2*g^3*e^2/(d*x + c
) + 2*(b*x*e + a*e)*A*a^4*c*d^3*g^3*e^2/(d*x + c) + (b*x*e + a*e)*B*a^4*c*d
^3*g^3*e^2/(d*x + c))*(b*c/((b*c*e - a*d*e)*(b*c - a*d)) - a*d/((b*c*e - a*
d*e)*(b*c - a*d)))/(b^4*d^2*f^6*e^2 - 2*b^4*c*d*f^5*g*e^2 - 4*a*b^3*d^2*f^5
*g*e^2 + b^4*c^2*f^4*g^2*e^2 + 8*a*b^3*c*d*f^4*g^2*e^2 + 6*a^2*b^2*d^2*f^4*
g^2*e^2 - 4*a*b^3*c^2*f^3*g^3*e^2 - 12*a^2*b^2*c*d*f^3*g^3*e^2 - 4*a^3*b*d^
2*f^3*g^3*e^2 + 6*a^2*b^2*c^2*f^2*g^4*e^2 + 8*a^3*b*c*d*f^2*g^4*e^2 + a^4*d
^2*f^2*g^4*e^2 - 4*a^3*b*c^2*f*g^5*e^2 - 2*a^4*c*d*f*g^5*e^2 + a^4*c^2*g^6*
e^2 - 2*(b*x*e + a*e)*b^3*d^3*f^6*e/(d*x + c) + 6*(b*x*e + a*e)*b^3*c*d^2*f
^5*g*e/(d*x + c) + 6*(b*x*e + a*e)*a*b^2*d^3*f^5*g*e/(d*x + c) - 6*(b*x*e +
 a*e)*b^3*c^2*d*f^4*g^2*e/(d*x + c) - 18*(b*x*e + a*e)*a*b^2*c*d^2*f^4*g^2*
e/(d*x + c) - 6*(b*x*e + a*e)*a^2*b*d^3*f^4*g^2*e/(d*x + c) + 2*(b*x*e + a*
e)*b^3*c^3*f^3*g^3*e/(d*x + c) + 18*(b*x*e + a*e)*a*b^2*c^2*d*f^3*g^3*e/(d*
x + c) + 18*(b*x*e + a*e)*a^2*b*c*d^2*f^3*g^3*e/(d*x + c) + 2*(b*x*e + a*e)
*a^3*d^3*f^3*g^3*e/(d*x + c) - 6*(b*x*e + a*e)*a*b^2*c^3*f^2*g^4*e/(d*x + c
) - 18*(b*x*e + a*e)*a^2*b*c^2*d*f^2*g^4*e/(d*x + c) - 6*(b*x*e + a*e)*a^3*
c*d^2*f^2*g^4*e/(d*x + c) + 6*(b*x*e + a*e)*a^2*b*c^3*f*g^5*e/(d*x + c) + 6
*(b*x*e + a*e)*a^3*c^2*d*f*g^5*e/(d*x + c) - 2*(b*x*e + a*e)*a^3*c^3*g^6*e/
(d*x + c) + (b*x*e + a*e)^2*b^2*d^4*f^6/(d*x + c)^2 - 4*(b*x*e + a*e)^2*b^2
*c*d^3*f^5*g/(d*x + c)^2 - 2*(b*x*e + a*e)^2*a*b*d^4*f^5*g/(d*x + c)^2 + 6*
(b*x*e + a*e)^2*b^2*c^2*d^2*f^4*g^2/(d*x + c)^2 + 8*(b*x*e + a*e)^2*a*b*c*d
^3*f^4*g^2/(d*x + c)^2 + (b*x*e + a*e)^2*a^2*d^4*f^4*g^2/(d*x + c)^2 - 4*(b
*x*e + a*e)^2*b^2*c^3*d*f^3*g^3/(d*x + c)^2 - 12*(b*x*e + a*e)^2*a*b*c^2*d^
2*f^3*g^3/(d*x + c)^2 - 4*(b*x*e + a*e)^2*a^2*c*d^3*f^3*g^3/(d*x + c)^2 + (
b*x*e + a*e)^2*b^2*c^4*f^2*g^4/(d*x + c)^2 + 8*(b*x*e + a*e)^2*a*b*c^3*d*f^
2*g^4/(d*x + c)^2 + 6*(b*x*e + a*e)^2*a^2*c^2*d^2*f^2*g^4/(d*x + c)^2 - 2*(
b*x*e + a*e)^2*a*b*c^4*f*g^5/(d*x + c)^2 - 4*(b*x*e + a*e)^2*a^2*c^3*d*f*g^
5/(d*x + c)^2 + (b*x*e + a*e)^2*a^2*c^4*g^6/(d*x + c)^2)
```

maple [B] time = 0.16, size = 5274, normalized size = 28.82

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)/(g*x+f)^3,x)
```

```
[Out] result too large to display
```

maxima [B] time = 0.99, size = 351, normalized size = 1.92

$$\frac{1}{2}\left(\frac{b^2\log\left(bx+a\right)}{b^2f^2g-2\,abfg^2+a^2g^3}-\frac{d^2\log\left(dx+c\right)}{d^2f^2g-2\,cdfg^2+c^2g^3}+\frac{\left(2\left(b^2cd-abd^2\right)f-\left(b^2c^2-a^2d^2\right)g\right)}{b^2d^2f^4+a^2c^2g^4-2\left(b^2cd+abd^2\right)f^3g+(b^2c^2+4\,abcd+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c
)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2
 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d
^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)
*f*g^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g
 + a*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b*e*x/(d*x + c) + a*e/(d*x + c))/(
g^3*x^2 + 2*f*g^2*x + f^2*g))*B - 1/2*A/(g^3*x^2 + 2*f*g^2*x + f^2*g)
```

mupad **[B]** time = 7.21, size = 417, normalized size = 2.28

$$\frac{\ln\left(f+g\,x\right)\,\left(g\,\left(B\,a^2\,d^2-B\,b^2\,c^2\right)-2\,B\,a\,b\,d^2\,f+2\,B\,b^2\,c\,d\,f\right)}{2\,a^2\,c^2\,g^4-4\,a^2\,c\,d\,f\,g^3+2\,a^2\,d^2\,f^2\,g^2-4\,a\,b\,c^2\,f\,g^3+8\,a\,b\,c\,d\,f^2\,g^2-4\,a\,b\,d^2\,f^3\,g+2\,b^2\,c^2\,f^2\,g^2-4\,b^2\,c\,d\,f^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(f + g*x)^3,x)
```

```
[Out] (log(f + g*x)*(g*(B*a^2*d^2 - B*b^2*c^2) - 2*B*a*b*d^2*f + 2*B*b^2*c*d*f))/
(2*a^2*c^2*g^4 + 2*b^2*d^2*f^4 + 2*a^2*d^2*f^2*g^2 + 2*b^2*c^2*f^2*g^2 - 4*
a*b*c^2*f*g^3 - 4*a*b*d^2*f^3*g - 4*a^2*c*d*f*g^3 - 4*b^2*c*d*f^3*g + 8*a*b
*c*d*f^2*g^2) - ((A*a*c*g^2 + A*b*d*f^2 - A*a*d*f*g - A*b*c*f*g - B*a*d*f*g
 + B*b*c*f*g)/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g) - (x*(B*a*d*g^2 - B*b
*c*g^2))/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g))/(2*f^2*g + 2*g^3*x^2 + 4*
f*g^2*x) + (B*b^2*log(a + b*x))/(2*a^2*g^3 + 2*b^2*f^2*g - 4*a*b*f*g^2) - (
B*log((e*(a + b*x))/(c + d*x)))/(2*g*(f^2 + g^2*x^2 + 2*f*g*x)) - (B*d^2*lo
g(c + d*x))/(2*c^2*g^3 + 2*d^2*f^2*g - 4*c*d*f*g^2)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**3,x)
```

```
[Out] Timed out
```

3.238 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^4}\,dx$

Optimal. Leaf size=275

$$\frac{B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3g(f+gx)^3}+\frac{b^3B\log(a}{3g(bf-}$$

```
[Out] -1/6*B*(-a*d+b*c)/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)^2-1/3*B*(-a*d+b*c)*(-a*d*g-
b*c*g+2*b*d*f)/(-a*g+b*f)^2/(-c*g+d*f)^2/(g*x+f)+1/3*b^3*B*ln(b*x+a)/g/(-a*
g+b*f)^3+1/3*(-A-B*ln(e*(b*x+a)/(d*x+c)))/g/(g*x+f)^3-1/3*B*d^3*ln(d*x+c)/g
/(-c*g+d*f)^3+1/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g
^2-3*c*d*f*g+3*d^2*f^2))*ln(g*x+f)/(-a*g+b*f)^3/(-c*g+d*f)^3
```

Rubi **[A]** time = 0.40, antiderivative size = 275, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = $\{2525, 12, 72\}$

$$\frac{B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3g(f+gx)^3}+\frac{b^3B\log(a}{3g(bf-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^4,x]
```

```
[Out] -(B*(b*c - a*d))/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*
B*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/
(3*g*(f + g*x)^3) - (B*d^3*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (B*(b*c - a*
d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*
g^2))*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^4}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3g(f+gx)^3}+\frac{B\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3g(f+gx)^3}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3g(f+gx)^3}+\frac{(B(bc-ad))\int\left(\frac{b^4}{(bc-ad)(bf-ag)^3(a+bx)}+\frac{d^4}{(bc-ad)(-df+cg)^3(c+dx)}+\right.}{}\\ &= -\frac{B(bc-ad)}{6(bf-ag)(df-cg)(f+gx)^2}-\frac{B(bc-ad)(2bdf-bcg-adg)}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^3B\log(a+b}{3g(bf-ag)^3}\end{aligned}$$

Mathematica [A] time = 0.72, size = 260, normalized size = 0.95

$$\frac{B(bc-ad)\left(\frac{g\log(f+gx)\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(bf-ag)^3(df-cg)^3}+\frac{b^3\log(a+bx)}{(bc-ad)(bf-ag)^3}+\frac{d^3\log(c+dx)}{(bc-ad)(cg-df)^3}+\frac{g(adg+bcg-2bdf)}{(f+gx)(bf-ag)^2(df-c}\right.}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^4,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^3) + B*(b*c - a*d)*(-1/2*
g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (g*(-2*b*d*f + b*c*g + a*d*g))/((
b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*Log[a + b*x])/((b*c - a*d)*(b*
f - a*g)^3) + (d^3*Log[c + d*x])/((b*c - a*d)*(-(d*f) + c*g)^3) + (g*(a^2*d
^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Lo
g[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(3*g)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.18, size = 18285, normalized size = 66.49

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)/(g*x+f)^4,x)
```

```
[Out] result too large to display
```

maxima [**B**] time = 1.29, size = 848, normalized size = 3.08

$$\frac{1}{6}\left(\frac{2\,b^3\log\left(bx+a\right)}{b^3f^3g-3\,ab^2f^2g^2+3\,a^2bfg^3-a^3g^4}-\frac{2\,d^3\log\left(dx+c\right)}{d^3f^3g-3\,cd^2f^2g^2+3\,c^2dfg^3-c^3g^4}+\frac{}{b^3d^3f^6+a^3c^3g^6-3\left(b^3cd^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - 2*log(b*e*x/(d*x + c) + a*e/(d*
x + c))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*B - 1/3*A/(g^4*x^3 +
 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

mupad [**B**] time = 10.67, size = 1154, normalized size = 4.20

$$\frac{\ln\left(f+g\,x\right)\,\left(g\,\left(3\,B\,a^2\,b\,d^3\,f-3\,B\,b^3\right.\right.}{3\,a^3\,c^3\,g^6-9\,a^3\,c^2\,d\,f\,g^5+9\,a^3\,c\,d^2\,f^2\,g^4-3\,a^3\,d^3\,f^3\,g^3-9\,a^2\,b\,c^3\,f\,g^5+27\,a^2\,b\,c^2\,d\,f^2\,g^4-27\,a^2\,b\,c\,d^2\,f^3\,g^3+9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(f + g*x)^4,x)
```

```
[Out] (log(f + g*x)*(g*(3*B*a^2*b*d^3*f - 3*B*b^3*c^2*d*f) - g^2*(B*a^3*d^3 - B*b
^3*c^3) - 3*B*a*b^2*d^3*f^2 + 3*B*b^3*c*d^2*f^2))/(3*a^3*c^3*g^6 + 3*b^3*d^
3*f^6 - 3*a^3*d^3*f^3*g^3 - 3*b^3*c^3*f^3*g^3 - 9*a^2*b*c^3*f*g^5 - 9*a*b^2
*d^3*f^5*g - 9*a^3*c^2*d*f*g^5 - 9*b^3*c*d^2*f^5*g + 9*a*b^2*c^3*f^2*g^4 +
9*a^2*b*d^3*f^4*g^2 + 9*a^3*c*d^2*f^2*g^4 + 9*b^3*c^2*d*f^4*g^2 + 27*a*b^2*
c*d^2*f^4*g^2 - 27*a*b^2*c^2*d*f^3*g^3 - 27*a^2*b*c*d^2*f^3*g^3 + 27*a^2*b*
c^2*d*f^2*g^4) - ((2*A*a^2*c^2*g^4 + 2*A*b^2*d^2*f^4 + 2*A*a^2*d^2*f^2*g^2
+ 2*A*b^2*c^2*f^2*g^2 + 3*B*a^2*d^2*f^2*g^2 - 3*B*b^2*c^2*f^2*g^2 - 4*A*a*b
*c^2*f*g^3 - 4*A*a*b*d^2*f^3*g + B*a*b*c^2*f*g^3 - 4*A*a^2*c*d*f*g^3 - 5*B*
a*b*d^2*f^3*g - 4*A*b^2*c*d*f^3*g - B*a^2*c*d*f*g^3 + 5*B*b^2*c*d*f^3*g + 8
*A*a*b*c*d*f^2*g^2)/(2*(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c
^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*
d*f^3*g + 4*a*b*c*d*f^2*g^2)) + (x^2*(B*a^2*d^2*g^4 - B*b^2*c^2*g^4 - 2*B*a
*b*d^2*f*g^3 + 2*B*b^2*c*d*f*g^3))/(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2
*g^2 + b^2*c^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^
3 - 2*b^2*c*d*f^3*g + 4*a*b*c*d*f^2*g^2) + (x*(5*B*a^2*d^2*f*g^3 - 5*B*b^2*
c^2*f*g^3 + B*a*b*c^2*g^4 - B*a^2*c*d*g^4 - 9*B*a*b*d^2*f^2*g^2 + 9*B*b^2*c
*d*f^2*g^2))/(2*(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*
g^2 - 2*a*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g
 + 4*a*b*c*d*f^2*g^2)))/(3*f^3*g + 3*g^4*x^3 + 9*f^2*g^2*x + 9*f*g^3*x^2) -
```

```
(B*b^3*log(a + b*x))/(3*a^3*g^4 - 3*b^3*f^3*g + 9*a*b^2*f^2*g^2 - 9*a^2*b*
f*g^3) + (B*d^3*log(c + d*x))/(3*c^3*g^4 - 3*d^3*f^3*g + 9*c*d^2*f^2*g^2 -
9*c^2*d*f*g^3) - (B*log((e*(a + b*x))/(c + d*x)))/(3*g*(f^3 + g^3*x^3 + 3*f
^2*g*x + 3*f*g^2*x^2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**4,x)
```

```
[Out] Timed out
```

3.239 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^5}\,dx$

Optimal. Leaf size=379

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf}{4(bf}$$

```
[Out] -1/12*B*(-a*d+b*c)/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)^3-1/8*B*(-a*d+b*c)*(-a*d*g
-b*c*g+2*b*d*f)/(-a*g+b*f)^2/(-c*g+d*f)^2/(g*x+f)^2-1/4*B*(-a*d+b*c)*(a^2*d
^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))/(-a*g+b*f)^3
/(-c*g+d*f)^3/(g*x+f)+1/4*b^4*B*ln(b*x+a)/g/(-a*g+b*f)^4+1/4*(-A-B*ln(e*(b*
x+a)/(d*x+c)))/g/(g*x+f)^4-1/4*B*d^4*ln(d*x+c)/g/(-c*g+d*f)^4-1/4*B*(-a*d+b
*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*
g+2*d^2*f^2))*ln(g*x+f)/(-a*g+b*f)^4/(-c*g+d*f)^4
```

Rubi [A] time = 0.62, antiderivative size = 379, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = {2525, 12, 72}

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf}{4(b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^5,x]
```

```
[Out] -(B*(b*c - a*d))/(12*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*
(2*b*d*f - b*c*g - a*d*g))/(8*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2)))/(4*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*Log[a +
 b*x])/(4*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(4*g*(f +
 g*x)^4) - (B*d^4*Log[c + d*x])/(4*g*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*b*d
*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f
*g + c^2*g^2))*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4g(f+gx)^4} + \frac{B\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \Bigg(\frac{b^5}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5}{(bc-ad)(-df+cg)^4(c+dx)} +}{}$$

$$= -\frac{B(bc-ad)}{12(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)}{8(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{B(bc-ad)\Big(}{}$$

Mathematica [**A**] time = 0.93, size = 355, normalized size = 0.94

$$\frac{B(bc-ad)\left(-\frac{g\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(f+gx)(bf-ag)^3(df-cg)^3} - \frac{g\log(f+gx)(adg+bcg-2bdf)\left(a^2d^2g^2-2abd^2fg+b^2\left(c^2g^2-2cdfg+2d^2f^2\right)\right)}{(bf-ag)^4(df-cg)^4}\right.}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^5,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^4) + B*(b*c - a*d)*(-1/3*
g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^3) + (g*(-2*b*d*f + b*c*g + a*d*g))/(2
*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 + a*b*d*g*(-3*d
*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)))/((b*f - a*g)^3*(d*f - c
*g)^3*(f + g*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^4) - (d^4*Lo
g[c + d*x])/((b*c - a*d)*(d*f - c*g)^4) - (g*(-2*b*d*f + b*c*g + a*d*g)*(-2
*a*b*d^2*f*g + a^2*d^2*g^2 + b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[f +
 g*x])/((b*f - a*g)^4*(d*f - c*g)^4)))/(4*g)
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 0.39, size = 44893, normalized size = 118.45

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)/(g*x+f)^5,x)
```

```
[Out] result too large to display
```

maxima [B] time = 1.99, size = 1757, normalized size = 4.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 6*log(b*e*x/(d*x + c) + a*
e/(d*x + c))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g))
*B - 1/4*A/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

mupad [B] time = 16.22, size = 2518, normalized size = 6.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))/(f + g*x)^5,x)
```

```
[Out] (log(f + g*x)*(g*(6*B*a^2*b^2*d^4*f^2 - 6*B*b^4*c^2*d^2*f^2) - g^2*(4*B*a^3
*b*d^4*f - 4*B*b^4*c^3*d*f) + g^3*(B*a^4*d^4 - B*b^4*c^4) - 4*B*a*b^3*d^4*f
^3 + 4*B*b^4*c*d^3*f^3))/(4*a^4*c^4*g^8 + 4*b^4*d^4*f^8 + 4*a^4*d^4*f^4*g^4
 + 4*b^4*c^4*f^4*g^4 + 24*a^2*b^2*c^4*f^2*g^6 + 24*a^2*b^2*d^4*f^6*g^2 + 24
*a^4*c^2*d^2*f^2*g^6 + 24*b^4*c^2*d^2*f^6*g^2 - 16*a^3*b*c^4*f*g^7 - 16*a*b
^3*d^4*f^7*g - 16*a^4*c^3*d*f*g^7 - 16*b^4*c*d^3*f^7*g - 16*a*b^3*c^4*f^3*g
^5 - 16*a^3*b*d^4*f^5*g^3 - 16*a^4*c*d^3*f^3*g^5 - 16*b^4*c^3*d*f^5*g^3 + 6
```

```
4*a*b^3*c*d^3*f^6*g^2 + 64*a*b^3*c^3*d*f^4*g^4 + 64*a^3*b*c*d^3*f^4*g^4 + 6
4*a^3*b*c^3*d*f^2*g^6 - 96*a*b^3*c^2*d^2*f^5*g^3 - 96*a^2*b^2*c*d^3*f^5*g^3
 - 96*a^2*b^2*c^3*d*f^3*g^5 - 96*a^3*b*c^2*d^2*f^3*g^5 + 144*a^2*b^2*c^2*d^
2*f^4*g^4) - ((6*A*a^3*c^3*g^6 + 6*A*b^3*d^3*f^6 - 6*A*a^3*d^3*f^3*g^3 - 6*
A*b^3*c^3*f^3*g^3 - 11*B*a^3*d^3*f^3*g^3 + 11*B*b^3*c^3*f^3*g^3 + 18*A*a*b^
2*c^3*f^2*g^4 + 18*A*a^2*b*d^3*f^4*g^2 - 7*B*a*b^2*c^3*f^2*g^4 + 18*A*a^3*c
*d^2*f^2*g^4 + 31*B*a^2*b*d^3*f^4*g^2 + 18*A*b^3*c^2*d*f^4*g^2 + 7*B*a^3*c*
d^2*f^2*g^4 - 31*B*b^3*c^2*d*f^4*g^2 - 18*A*a^2*b*c^3*f*g^5 - 18*A*a*b^2*d^
3*f^5*g + 2*B*a^2*b*c^3*f*g^5 - 18*A*a^3*c^2*d*f*g^5 - 26*B*a*b^2*d^3*f^5*g
 - 18*A*b^3*c*d^2*f^5*g - 2*B*a^3*c^2*d*f*g^5 + 26*B*b^3*c*d^2*f^5*g + 54*A
*a*b^2*c*d^2*f^4*g^2 - 54*A*a*b^2*c^2*d*f^3*g^3 - 54*A*a^2*b*c*d^2*f^3*g^3
+ 54*A*a^2*b*c^2*d*f^2*g^4 + 15*B*a*b^2*c^2*d*f^3*g^3 - 15*B*a^2*b*c*d^2*f^
3*g^3)/(6*(a^3*c^3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 -
3*a^2*b*c^3*f*g^5 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5
*g + 3*a*b^2*c^3*f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^
3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c
*d^2*f^3*g^3 + 9*a^2*b*c^2*d*f^2*g^4)) - (x^2*(B*a*b^2*c^3*g^6 - B*a^3*c*d^
2*g^6 + 7*B*a^3*d^3*f*g^5 - 7*B*b^3*c^3*f*g^5 + 20*B*a*b^2*d^3*f^3*g^3 - 21
*B*a^2*b*d^3*f^2*g^4 - 20*B*b^3*c*d^2*f^3*g^3 + 21*B*b^3*c^2*d*f^2*g^4 - 3*
B*a*b^2*c^2*d*f*g^5 + 3*B*a^2*b*c*d^2*f*g^5))/(2*(a^3*c^3*g^6 + b^3*d^3*f^6
 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5 - 3*a*b^2*d^3*f^5*
g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f^2*g^4 + 3*a^2*b*d
^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*
g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a^2*b*c^2*d*f^2*g^4
)) + (x*(B*a^2*b*c^3*g^6 - B*a^3*c^2*d*g^6 - 13*B*a^3*d^3*f^2*g^4 + 13*B*b^
3*c^3*f^2*g^4 - 34*B*a*b^2*d^3*f^4*g^2 + 38*B*a^2*b*d^3*f^3*g^3 + 34*B*b^3*
c*d^2*f^4*g^2 - 38*B*b^3*c^2*d*f^3*g^3 - 5*B*a*b^2*c^3*f*g^5 + 5*B*a^3*c*d^
2*f*g^5 + 12*B*a*b^2*c^2*d*f^2*g^4 - 12*B*a^2*b*c*d^2*f^2*g^4))/(3*(a^3*c^3
*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5
- 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f
^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 +
9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a
^2*b*c^2*d*f^2*g^4)) - (x^3*(B*a^3*d^3*g^6 - B*b^3*c^3*g^6 + 3*B*a*b^2*d^3*
f^2*g^4 - 3*B*b^3*c*d^2*f^2*g^4 - 3*B*a^2*b*d^3*f*g^5 + 3*B*b^3*c^2*d*f*g^5
))/(a^3*c^3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b
*c^3*f*g^5 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*
a*b^2*c^3*f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d
*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^
3*g^3 + 9*a^2*b*c^2*d*f^2*g^4))/(4*f^4*g + 4*g^5*x^4 + 16*f^3*g^2*x + 16*f*
g^4*x^3 + 24*f^2*g^3*x^2) - (B*log((e*(a + b*x))/(c + d*x)))/(4*g*(f^4 + g^
4*x^4 + 4*f^3*g*x + 4*f*g^3*x^3 + 6*f^2*g^2*x^2)) + (B*b^4*log(a + b*x))/(4
*a^4*g^5 + 4*b^4*f^4*g - 16*a*b^3*f^3*g^2 + 24*a^2*b^2*f^2*g^3 - 16*a^3*b*f
*g^4) - (B*d^4*log(c + d*x))/(4*c^4*g^5 + 4*d^4*f^4*g - 16*c*d^3*f^3*g^2 +
24*c^2*d^2*f^2*g^3 - 16*c^3*d*f*g^4)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**5,x)
```

```
[Out] Timed out
```

3.240 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=874

$$\frac{B^2g^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3\log(c+dx)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3x(bc-ad)^3}{6b^3d^3}+\frac{B^2g^2(4bdf-3bcg-adg)\log\left(\frac{a+bx}{c+dx}\right)}{4b^4d^4}$$

```
[Out] 1/6*B^2*(-a*d+b*c)^3*g^3*x/b^3/d^3+1/4*B^2*(-a*d+b*c)^2*g^2*(-a*d*g-3*b*c*g
+4*b*d*f)*x/b^3/d^3+1/12*B^2*(-a*d+b*c)^2*g^3*(d*x+c)^2/b^2/d^4+1/6*B^2*(-a
*d+b*c)^4*g^3*ln((b*x+a)/(d*x+c))/b^4/d^4+1/4*B^2*(-a*d+b*c)^3*g^2*(-a*d*g-
3*b*c*g+4*b*d*f)*ln((b*x+a)/(d*x+c))/b^4/d^4-1/2*B*(-a*d+b*c)*g*(a^2*d^2*g^
2-2*a*b*d*g*(-c*g+2*d*f)+b^2*(3*c^2*g^2-8*c*d*f*g+6*d^2*f^2))*(b*x+a)*(A+B*
ln(e*(b*x+a)/(d*x+c)))/b^4/d^3-1/4*B*(-a*d+b*c)*g^2*(-a*d*g-3*b*c*g+4*b*d*f
)*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/d^4-1/6*B*(-a*d+b*c)*g^3*(d*x+c
)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d^4-1/2*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*
f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*ln((-a*d+b
*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^4/d^4-1/4*(-a*g+b*f)^4*(A+B*ln
(e*(b*x+a)/(d*x+c)))^2/b^4/g+1/4*(g*x+f)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g+
1/6*B^2*(-a*d+b*c)^4*g^3*ln(d*x+c)/b^4/d^4+1/4*B^2*(-a*d+b*c)^3*g^2*(-a*d*g
-3*b*c*g+4*b*d*f)*ln(d*x+c)/b^4/d^4+1/2*B^2*(-a*d+b*c)^2*g*(a^2*d^2*g^2-2*a
*b*d*g*(-c*g+2*d*f)+b^2*(3*c^2*g^2-8*c*d*f*g+6*d^2*f^2))*ln(d*x+c)/b^4/d^4-
1/2*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c
^2*g^2-2*c*d*f*g+2*d^2*f^2))*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^4
```

Rubi [A] time = 1.74, antiderivative size = 994, normalized size of antiderivative = 1.14, number of steps used = 33, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.448$, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2\log^2(a+bx)(bf-ag)^4}{4b^4g}-\frac{B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)(bf-ag)^4}{2b^4g}-\frac{B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)(bf-ag)}{2b^4g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*(b*c + a*d)*g^3*x)/(6*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2
*(4*b*d*f - b*c*g - a*d*g)*x)/(4*b^3*d^3) - (A*B*(b*c - a*d)*g*(a^2*d^2*g^2
 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*x)/(2*b^3
*d^3) + (B^2*(b*c - a*d)^2*g^3*x^2)/(12*b^2*d^2) - (a^3*B^2*(b*c - a*d)*g^3
*Log[a + b*x])/(6*b^4*d) + (a^2*B^2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*
g)*Log[a + b*x])/(4*b^4*d^2) + (B^2*(b*f - a*g)^4*Log[a + b*x]^2)/(4*b^4*g)
 - (B^2*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2
 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(2*b^4*d^3
) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(4*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(6*b*d) - (B*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(2*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/(4*g) + (B^2*c^3*(b*c - a*d)*g^3*Log[c + d*x])/(6*b*d^4) - (B^2*c^
2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(4*b^2*d^4) + (B^
2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*Log[c + d*x])/(2*b^4*d^4) - (B^2*(d*f - c*g)^4*Log[-((
d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*d^4*g) + (B*(d*f - c*g)^4*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(2*d^4*g) + (B^2*(d*f - c*g)^
4*Log[c + d*x]^2)/(4*d^4*g) - (B^2*(b*f - a*g)^4*Log[a + b*x]*Log[(b*(c + d
*x))/(b*c - a*d)])/(2*b^4*g) - (B^2*(b*f - a*g)^4*PolyLog[2, -((d*(a + b*x)
```

```
)/(b*c - a*d))])/(2*b^4*g) - (B^2*(d*f - c*g)^4*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(2*d^4*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\begin{aligned}
\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx &= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{B\int\frac{(bc-ad)(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}}{2g}\\
&= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int\frac{(f+gx)^4\left(A+B\log\left(\frac{e(}{c}\right.\right.}{(a+bx)(c+dx)}}{2g}\\
&= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int\left(\frac{g^2\left(a^2d^2g^2-abdg(4d\right.}{}\right.}{}\\
&= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{\left(B(bc-ad)g^3\right)\int x^2\left(A+B\log\right.}{2bd}\\
&= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c\right.\right.}{2b^3d^3}\\
&= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c\right.\right.}{2b^3d^3}\\
&= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c\right.\right.}{2b^3d^3}\\
&= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3}\\
&= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3}\\
&= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3}\\
&= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3}
\end{aligned}$$

Mathematica [A] time = 0.98, size = 733, normalized size = 0.84

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2-\frac{B\left(Bg^4(bc-ad)\left(2a^3d^3\log(a+bx)+bdx(bc-ad)(2ad+2bc-bdx)-2b^3c^3\log(c+dx)\right)+6Abdg^2x(bc-ad)\left(a^2d\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(6*A*b*d*(b*c - a*
d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g +
 c^2*g^2))*x + 6*B*d*(b*c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g)
+ b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]) + 2*b^3*d^3*(b*c - a*d)*g^4*x^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) + 6*d^4*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*
```

```
x))/(c + d*x)]) - 6*B*(b*c - a*d)^2*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*
g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[c + d*x] - 6*b^4*(d*f - c*g
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + B*(b*c - a*d)*g^4*(
b*d*(b*c - a*d)*x*(2*b*c + 2*a*d - b*d*x) + 2*a^3*d^3*Log[a + b*x] - 2*b^3*
c^3*Log[c + d*x]) - 3*B*(b*c - a*d)*g^3*(-4*b*d*f + b*c*g + a*d*g)*(-(a^2*d
^2*Log[a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*B*d^4*(
b*f - a*g)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]
) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 3*b^4*B*(d*f - c*g)^4*((2
*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)]))))/(3*b^4*d^4))/(4*g)
```

fricas [F] time = 1.87, size = 0, normalized size = 0.00

$$\text{integral}\left(A^{2} g^{3} x^{3} + 3\, A^{2} f g^{2} x^{2} + 3\, A^{2} f^{2} g x + A^{2} f^{3} + \left(B^{2} g^{3} x^{3} + 3\, B^{2} f g^{2} x^{2} + 3\, B^{2} f^{2} g x + B^{2} f^{3}\right) \log\left(\frac{b e x + a e}{d x + c}\right)^{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*g^3
*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b*e*x + a*e)/(d*x +
c))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*log((b*
e*x + a*e)/(d*x + c)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 2.58, size = 0, normalized size = 0.00

$$\int \left(g x + f\right)^{3} \left(B \ln\left(\frac{\left(b x + a\right) e}{d x + c}\right) + A\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((g*x+f)^3*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [B] time = 1.91, size = 2140, normalized size = 2.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/4*A^2*g^3*x^4 + A^2*f*g^2*x^3 + 3/2*A^2*f^2*g*x^2 + 2*(x*log(b*e*x/(d*x +
 c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*f^3 + 3*(x^
2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x
 + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*f^2*g + (2*x^3*log(b*e*x/(d*x + c) + a
*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d
 - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*f*g^2 + 1/12*(6*x
^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*lo
g(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
```

```
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*g^3 + A^2*f^3*x - 1/12*(6*a^
3*c*d^3*g^3 - 3*(8*c*d^3*f*g^2 - c^2*d^2*g^3)*a^2*b + 2*(18*c*d^3*f^2*g - 6
*c^2*d^2*f*g^2 + c^3*d*g^3)*a*b^2 + (24*c*d^3*f^3*log(e) - (6*g^3*log(e) +
11*g^3)*c^4 + 12*(2*f*g^2*log(e) + 3*f*g^2)*c^3*d - 36*(f^2*g*log(e) + f^2*
g)*c^2*d^2)*b^3)*B^2*log(d*x + c)/(b^3*d^4) + 1/2*(4*a*b^3*d^4*f^3 - 6*a^2*
b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3 - (4*c*d^3*f^3 - 6*c^2*d^2*
f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*b^4)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
- a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) + 1/12*(3*B^
2*b^4*d^4*g^3*x^4*log(e)^2 + 2*(a*b^3*d^4*g^3*log(e) + (6*d^4*f*g^2*log(e)^
2 - c*d^3*g^3*log(e))*b^4)*B^2*x^3 - ((3*g^3*log(e) - g^3)*a^2*b^2*d^4 - 2*
(6*d^4*f*g^2*log(e) - c*d^3*g^3)*a*b^3 - (18*d^4*f^2*g*log(e)^2 - 12*c*d^3*
f*g^2*log(e) + (3*g^3*log(e) + g^3)*c^2*d^2)*b^4)*B^2*x^2 + ((6*g^3*log(e)
- 5*g^3)*a^3*b*d^4 + (5*c*d^3*g^3 - 12*(2*f*g^2*log(e) - f*g^2)*d^4)*a^2*b^
2 + (36*d^4*f^2*g*log(e) - 24*c*d^3*f*g^2 + 5*c^2*d^2*g^3)*a*b^3 + (12*d^4*
f^3*log(e)^2 - 36*c*d^3*f^2*g*log(e) - (6*g^3*log(e) + 5*g^3)*c^3*d + 12*(2
*f*g^2*log(e) + f*g^2)*c^2*d^2)*b^4)*B^2*x + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2
*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*a*b
^3*d^4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3)*B^2)*lo
g(b*x + a)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4
*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*c*d^3*f^3 - 6*c^2*d^2*f^2*g + 4*c
^3*d*f*g^2 - c^4*g^3)*B^2*b^4)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(
e) + 2*(a*b^3*d^4*g^3 + (12*d^4*f*g^2*log(e) - c*d^3*g^3)*b^4)*B^2*x^3 + 3*
(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (12*d^4*f^2*g*log(e) - 4*c*d^3*f*g^2
 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4*a^2*b^2*d^4*f*g^2 +
 a^3*b*d^4*g^3 + (4*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^2*f*g^2 - c^3*
d*g^3)*b^4)*B^2*x - ((6*g^3*log(e) - 11*g^3)*a^4*d^4 + 2*(c*d^3*g^3 - 6*(2*
f*g^2*log(e) - 3*f*g^2)*d^4)*a^3*b - 3*(4*c*d^3*f*g^2 - c^2*d^2*g^3 - 12*(f
^2*g*log(e) - f^2*g)*d^4)*a^2*b^2 - 6*(4*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4
*c^2*d^2*f*g^2 - c^3*d*g^3)*a*b^3)*B^2)*log(b*x + a) - (6*B^2*b^4*d^4*g^3*x
^4*log(e) + 2*(a*b^3*d^4*g^3 + (12*d^4*f*g^2*log(e) - c*d^3*g^3)*b^4)*B^2*x
^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (12*d^4*f^2*g*log(e) - 4*c*d^
3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4*a^2*b^2*d^4*
f*g^2 + a^3*b*d^4*g^3 + (4*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^2*f*g^2
 - c^3*d*g^3)*b^4)*B^2*x + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3
 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*a*b^3*d^4*f^3 - 6*a^2
*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3)*B^2)*log(b*x + a))*log(d*
x + c))/(b^4*d^4)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)^3\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.241 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=532

$$\frac{2B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b^3d^3}+2B^2(bc-$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g^2*x/b^2/d^2+1/3*B^2*(-a*d+b*c)^3*g^2*ln((b*x+a)/(d*x
+c))/b^3/d^3-2/3*B*(-a*d+b*c)*g*(-a*d*g-2*b*c*g+3*b*d*f)*(b*x+a)*(A+B*ln(e*
(b*x+a)/(d*x+c)))/b^3/d^2-1/3*B*(-a*d+b*c)*g^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/
(d*x+c)))/b/d^3+2/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2
*g^2-3*c*d*f*g+3*d^2*f^2))*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+
c)))/b^3/d^3-1/3*(-a*g+b*f)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^3/g+1/3*(g*x+
f)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g+1/3*B^2*(-a*d+b*c)^3*g^2*ln(d*x+c)/b^3
/d^3+2/3*B^2*(-a*d+b*c)^2*g*(-a*d*g-2*b*c*g+3*b*d*f)*ln(d*x+c)/b^3/d^3+2/3*
B^2*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d
^2*f^2))*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^3
```

Rubi **[A]** time = 1.09, antiderivative size = 649, normalized size of antiderivative = 1.22, number of steps used = 29, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2(bf-ag)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3g}-\frac{2B^2(df-cg)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3d^3g}+\frac{a^2B^2g^2(bc-ad)\log(a+bx)}{3b^3d}-2ABgx$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^2*g^2*x)/(3*b^2*d^2) - (2*A*B*(b*c - a*d)*g*(3*b*d*f - b*c
*g - a*d*g)*x)/(3*b^2*d^2) + (a^2*B^2*(b*c - a*d)*g^2*Log[a + b*x])/(3*b^3*
d) + (B^2*(b*f - a*g)^3*Log[a + b*x]^2)/(3*b^3*g) - (2*B^2*(b*c - a*d)*g*(3
*b*d*f - b*c*g - a*d*g)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*b^3*d^2)
 - (B*(b*c - a*d)*g^2*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*d) - (
2*B*(b*f - a*g)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3
*g) + ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*g) - (B^2*c^2
*(b*c - a*d)*g^2*Log[c + d*x])/(3*b*d^3) + (2*B^2*(b*c - a*d)^2*g*(3*b*d*f
- b*c*g - a*d*g)*Log[c + d*x])/(3*b^3*d^3) - (2*B^2*(d*f - c*g)^3*Log[-((d*
(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^3*g) + (2*B*(d*f - c*g)^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*d^3*g) + (B^2*(d*f - c*g)^
3*Log[c + d*x]^2)/(3*d^3*g) - (2*B^2*(b*f - a*g)^3*Log[a + b*x]*Log[(b*(c +
 d*x))/(b*c - a*d)])/(3*b^3*g) - (2*B^2*(b*f - a*g)^3*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/(3*b^3*g) - (2*B^2*(d*f - c*g)^3*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])/(3*d^3*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{(2B)\int\frac{(bc-ad)(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{(2B(bc-ad))\int\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+}{c+d}\right.\right.}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{(2B(bc-ad))\int\left(\frac{g^2(3bdf-bcg-adg)\left(A\right.}{b^2d^2}\right.}{}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{\left(2B(bc-ad)g^2\right)\int x\left(A+B\log\left(\right.\right.}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{B(bc-ad)g^2x^2\left(A+B\log\left(\right.\right.}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-bcg-}{3b^3d}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-bcg-}{3b^3d}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-}{}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-}{}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-}{}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-}{}$$

Mathematica [A] time = 0.53, size = 486, normalized size = 0.91

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2-\frac{B\left(-Bg^3(bc-ad)\left(a^2d^2\log(a+bx)-b\left(dx(ad-bc)+bc^2\log(c+dx)\right)\right)-2b^3(df-cg)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx}{c+dx}\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(2*A*b*d*(b*c - a*
d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + 2*B*d*(b*c - a*d)*g^2*(3*b*d*f - b*c*g
 - a*d*g)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*(b*c - a*d)*g^3*
x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d^3*(b*f - a*g)^3*Log[a + b*x]
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*B*(b*c - a*d)^2*g^2*(-3*b*d*f + b
*c*g + a*d*g)*Log[c + d*x] - 2*b^3*(d*f - c*g)^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x] - B*(b*c - a*d)*g^3*(a^2*d^2*Log[a + b*x] - b*(d*(-
(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - B*d^3*(b*f - a*g)^3*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + b^3*B*(d*f - c*g)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)))/(b^3*d^3))/(3*g)
```

fricas [F] time = 0.83, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2g^2x^2+2\,A^2fgx+A^2f^2+\left(B^2g^2x^2+2\,B^2fgx+B^2f^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left(ABg^2x^2+2\,ABfgx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*x +
 B^2*f^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x + A
*B*f^2)*log((b*e*x + a*e)/(d*x + c)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 2.10, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)^{2} \left(B\ln\left(\frac{(bx+a)\,e}{dx+c}\right)+A\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((g*x+f)^2*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [B] time = 2.04, size = 1300, normalized size = 2.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/3*A^2*g^2*x^3 + A^2*f*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*f^2 + 2*(x^2*log(b*e*x/(d*x + c)
+ a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d
)*x/(b*d))*A*B*f*g + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*g^2 + A^2*f^2*x + 1/3*(2*a^2*c*d^2*g^
2 - (6*c*d^2*f*g - c^2*d*g^2)*a*b - (6*c*d^2*f^2*log(e) + (2*g^2*log(e) + 3
*g^2)*c^3 - 6*(f*g*log(e) + f*g)*c^2*d)*b^2)*B^2*log(d*x + c)/(b^2*d^3) + 2
/3*(3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2 - (3*c*d^2*f^2 - 3*c^2*
d*f*g + c^3*g^2)*b^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + di
log(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*l
og(e)^2 + (a*b^2*d^3*g^2*log(e) + (3*d^3*f*g*log(e)^2 - c*d^2*g^2*log(e))*b
^3)*B^2*x^2 - ((2*g^2*log(e) - g^2)*a^2*b*d^3 - 2*(3*d^3*f*g*log(e) - c*d^2
*g^2)*a*b^2 - (3*d^3*f^2*log(e)^2 - 6*c*d^2*f*g*log(e) + (2*g^2*log(e) + g^
2)*c^2*d)*b^3)*B^2*x + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2
*b^3*d^3*f^2*x + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2)*B^2)*log
(b*x + a)^2 + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2*b^3*d^3*
f^2*x + (3*c*d^2*f^2 - 3*c^2*d*f*g + c^3*g^2)*B^2*b^3)*log(d*x + c)^2 + (2*
B^2*b^3*d^3*g^2*x^3*log(e) + (a*b^2*d^3*g^2 + (6*d^3*f*g*log(e) - c*d^2*g^2
)*b^3)*B^2*x^2 + 2*(3*a*b^2*d^3*f*g - a^2*b*d^3*g^2 + (3*d^3*f^2*log(e) - 3
*c*d^2*f*g + c^2*d*g^2)*b^3)*B^2*x + ((2*g^2*log(e) - 3*g^2)*a^3*d^3 + (c*d
^2*g^2 - 6*(f*g*log(e) - f*g)*d^3)*a^2*b + 2*(3*d^3*f^2*log(e) - 3*c*d^2*f*
g + c^2*d*g^2)*a*b^2)*B^2)*log(b*x + a) - (2*B^2*b^3*d^3*g^2*x^3*log(e) + (
a*b^2*d^3*g^2 + (6*d^3*f*g*log(e) - c*d^2*g^2)*b^3)*B^2*x^2 + 2*(3*a*b^2*d^
3*f*g - a^2*b*d^3*g^2 + (3*d^3*f^2*log(e) - 3*c*d^2*f*g + c^2*d*g^2)*b^3)*B
^2*x + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x
 + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2)*B^2)*log(b*x + a))*log
(d*x + c))/(b^3*d^3)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int {\left(f+g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.242 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=270

$$\frac{B(bc-ad)(-adg-bcg+2bdf)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2d^2}-\frac{(bf-ag)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2b^2g}-Bg(a+$$

```
[Out] -B*(-a*d+b*c)*g*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2/d+B*(-a*d+b*c)*(-a*
d*g-b*c*g+2*b*d*f)*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b^2
/d^2-1/2*(-a*g+b*f)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b^2/g+1/2*(g*x+f)^2*(A+
B*ln(e*(b*x+a)/(d*x+c)))^2/g+B^2*(-a*d+b*c)^2*g*ln(d*x+c)/b^2/d^2+B^2*(-a*d
+b*c)*(-a*d*g-b*c*g+2*b*d*f)*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^2
```

Rubi [A] time = 0.82, antiderivative size = 444, normalized size of antiderivative = 1.64, number of steps used = 25, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2(bf-ag)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}-\frac{B^2(df-cg)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2g}-\frac{B(bf-ag)^2\log(a+bx)\left(B\log\left(\frac{e(a+b}{c+d}\right.\right.}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*x)/(b*d)) + (B^2*(b*f - a*g)^2*Log[a + b*x]^2)/(2*b^2*
g) - (B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^2*d) - (
B*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g)
+ ((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*g) + (B^2*(b*c -
a*d)^2*g*Log[c + d*x])/(b^2*d^2) - (B^2*(d*f - c*g)^2*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x])/(d^2*g) + (B*(d*f - c*g)^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)])*Log[c + d*x])/(d^2*g) + (B^2*(d*f - c*g)^2*Log[c + d*x]^2)/
(2*d^2*g) - (B^2*(b*f - a*g)^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])
/(b^2*g) - (B^2*(b*f - a*g)^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^
2*g) - (B^2*(d*f - c*g)^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{B\int \frac{(bc-ad)(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{(B(bc-ad))\int \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a-}{c+}\right.\right.}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{(B(bc-ad))\int\left(\frac{g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.}{bd}\right.}{}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{(B(bc-ad)g)\int\left(A+B\log\left(\frac{e(a+}{c+}\right.\right.}{bd}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B(bf-ag)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} +$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)}{}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)}{}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)}{}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)}{}$$

$$= -\frac{AB(bc-ad)gx}{bd} + \frac{B^2(bf-ag)^2\log^2(a+bx)}{2b^2g} - \frac{B^2(bc-ad)g(a+b}{b^2d}$$

$$= -\frac{AB(bc-ad)gx}{bd} + \frac{B^2(bf-ag)^2\log^2(a+bx)}{2b^2g} - \frac{B^2(bc-ad)g(a+b}{b^2d}$$

Mathematica [**A**]   time = 0.35, size = 346, normalized size = 1.28

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B\left(-2b^2(df-cg)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2d^2(bf-ag)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2Abdg\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] ((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(2*A*b*d*(b*c - a*
d)*g^2*x + 2*B*d*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 2
*d^2*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*
(b*c - a*d)^2*g^2*Log[c + d*x] - 2*b^2*(d*f - c*g)^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x] - B*d^2*(b*f - a*g)^2*(Log[a + b*x]*(Log[a + b*
x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
 + a*d)]) + b^2*B*(d*f - c*g)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
```

```
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b^2*d
^2))/(2*g)
```

fricas [F] time = 1.12, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABgx + ABf\right)\log\left(\frac{bex+ae}{dx+c}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b*e*x + a*e)/(d*x + c))^2
 + 2*(A*B*g*x + A*B*f)*log((b*e*x + a*e)/(d*x + c)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.67, size = 0, normalized size = 0.00

$$\int \left(gx+f\right)\left(B\ln\left(\frac{(bx+a)\,e}{dx+c}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((g*x+f)*(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [B] time = 1.92, size = 673, normalized size = 2.49

$$\frac{1}{2}A^2gx^2+2\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)ABf+\left(x^2\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/
b - c*log(d*x + c)/d)*A*B*f + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a
^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*g + A
^2*f*x - (a*c*d*g + (2*c*d*f*log(e) - (g*log(e) + g)*c^2)*b)*B^2*log(d*x +
c)/(b*d^2) + (2*a*b*d^2*f - a^2*d^2*g - (2*c*d*f - c^2*g)*b^2)*(log(b*x + a
)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B
^2/(b^2*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(a*b*d^2*g*log(e) + (d^2
*f*log(e)^2 - c*d*g*log(e))*b^2)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2
*f*x + (2*a*b*d^2*f - a^2*d^2*g)*B^2)*log(b*x + a)^2 + (B^2*b^2*d^2*g*x^2 +
 2*B^2*b^2*d^2*f*x + (2*c*d*f - c^2*g)*B^2*b^2)*log(d*x + c)^2 + 2*(B^2*b^2
*d^2*g*x^2*log(e) + (a*b*d^2*g + (2*d^2*f*log(e) - c*d*g)*b^2)*B^2*x - ((g*
log(e) - g)*a^2*d^2 - (2*d^2*f*log(e) - c*d*g)*a*b)*B^2)*log(b*x + a) - 2*(
B^2*b^2*d^2*g*x^2*log(e) + (a*b*d^2*g + (2*d^2*f*log(e) - c*d*g)*b^2)*B^2*x
 + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x + (2*a*b*d^2*f - a^2*d^2*g)*B^2)*
log(b*x + a))*log(d*x + c))/(b^2*d^2)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
[Out] int((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
[Out] Timed out
```

3.243 $\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=125

$$\frac{2B(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b}+\frac{2B^2(bc-ad)\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{bd}$$

```
[Out] 2*B*(-a*d+b*c)*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))/b/d+(b*
x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/b+2*B^2*(-a*d+b*c)*polylog(2,d*(b*x+a)/b
/(d*x+c))/b/d
```

Rubi [A] time = 0.64, antiderivative size = 246, normalized size of antiderivative = 1.97, number of steps used = 22, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2523, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2aB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b}+\frac{2B^2c\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d}+\frac{2aB\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b}-\frac{2Bc\log(c+dx)\Big(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((a*B^2*Log[a + b*x]^2)/b) + (2*a*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/b + x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (2*B^2*c*Log[-(
(d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (2*B*c*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x])/d - (B^2*c*Log[c + d*x]^2)/d + (2*a*B^2*Log[a
+ b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (2*a*B^2*PolyLog[2, -((d*(a + b*
x))/(b*c - a*d))])/b + (2*B^2*c*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/d
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - (2B)\int \frac{(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - (2B(bc-ad))\int \frac{x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - (2B(bc-ad))\int \Bigg(-\frac{a\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)} + \frac{c\,(}{(}$$

$$= x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 + (2aB)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}dx - (2Bc)\int \frac{A+B}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\,(A}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\,(A}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\,(A}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\,(A}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 + \frac{2B^2c\log}{}$$

$$= -\frac{aB^2\log^2(a+bx)}{b} + \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(}{}\right.\right.$$

$$= -\frac{aB^2\log^2(a+bx)}{b} + \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(}{}\right.\right.$$

Mathematica [A] time = 0.21, size = 214, normalized size = 1.71

$$\frac{B\left(2ad\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2bc\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-aBd\left(\log(a+bx)\left(\log(a+bx)\right.\right.\right.}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*a*d*Log[a + b*x]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) - 2*b*c*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Lo
g[c + d*x] - a*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*c*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/(b*d)
```

fricas [F] time = 1.17, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
+ c)) + A^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.52, size = 0, normalized size = 0.00

$$\int \left(B\ln\left(\frac{(bx+a)\,e}{dx+c}\right)+A\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\left(x\log\left(\frac{(bx+a)e}{dx+c}\right)+\frac{\frac{ae\log(bx+a)}{b}-\frac{ce\log(dx+c)}{d}}{e}\right)AB+A^{2}x+B^{2}\left(\frac{bdx\log(bx+a)^{2}+(bdx+bc)\log(dx+c)^{2}-2\left(}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 2*(x*log((b*x + a)*e/(d*x + c)) + (a*e*log(b*x + a)/b - c*e*log(d*x + c)/d)
/e)*A*B + A^2*x + B^2*((b*d*x*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2
 - 2*(b*d*x*log(e) + (b*d*x + a*d)*log(b*x + a))*log(d*x + c))/(b*d) + inte
grate(((log(e)^2 + 2*log(e))*b^2*d*x^2 + a*b*c*log(e)^2 + (b^2*c*log(e)^2 +
 (log(e)^2 + 2*log(e))*a*b*d)*x + 2*(b^2*d*x^2*log(e) + a*b*c*log(e) + a^2*
d + (a*b*d*(log(e) + 2) + b^2*c*(log(e) - 1))*x)*log(b*x + a))/(b^2*d*x^2 +
 a*b*c + (b^2*c + a*b*d)*x), x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.244 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{f+gx}\,dx$

Optimal. Leaf size=277

$$\frac{2B\text{Li}_2\left(\frac{(df-cg)(a+bx)}{(bf-ag)(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}+\frac{\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g}-\frac{2B\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\Big(B\log\Big(}{g}$$

```
[Out] -ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g+(A+B*ln(e*(b*x+a)
/(d*x+c)))^2*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/g-2*B*(A+B*ln(e*(b
*x+a)/(d*x+c)))*polylog(2,d*(b*x+a)/b/(d*x+c))/g+2*B*(A+B*ln(e*(b*x+a)/(d*x
+c)))*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/g+2*B^2*polylog(3,d*
(b*x+a)/b/(d*x+c))/g-2*B^2*polylog(3,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))
/g
```

Rubi [B] time = 4.90, antiderivative size = 1998, normalized size of antiderivative = 7.21, number of steps used = 41, number of rules used = 21, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.724, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2437, 2435, 2315}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x),x]
```

```
[Out] -((B^2*Log[a + b*x]^2*Log[f + g*x])/g) - (2*A*B*Log[-((g*(a + b*x))/(b*f -
a*g))]*Log[f + g*x])/g - (B^2*Log[(c + d*x)^(-1)]^2*Log[f + g*x])/g + (2*B^
2*Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - L
og[(e*(a + b*x))/(c + d*x)])*Log[f + g*x])/g + ((A + B*Log[(e*(a + b*x))/(c
 + d*x)])^2*Log[f + g*x])/g + (2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
c + d*x]*Log[f + g*x])/g - (2*B^2*Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[(c
 + d*x)^(-1)] + Log[c + d*x])*Log[f + g*x])/g + (2*B^2*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)]*Log[f + g*x])/g + (2*A*B*Log[-((g*(c + d*x))/(d*f -
 c*g))]*Log[f + g*x])/g - (2*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[
(e*(a + b*x))/(c + d*x)])*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g
 + (B^2*Log[a + b*x]^2*Log[(b*(f + g*x))/(b*f - a*g)])/g + (B^2*Log[(c + d*
x)^(-1)]^2*Log[(d*(f + g*x))/(d*f - c*g)])/g + (B^2*(Log[(b*(c + d*x))/(b*c
 - a*d)] + Log[(b*f - a*g)/(b*(f + g*x))] - Log[((b*f - a*g)*(c + d*x))/((b
*c - a*d)*(f + g*x))])*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)
))]^2)/g - (B^2*(Log[(b*(c + d*x))/(b*c - a*d)] - Log[-((g*(c + d*x))/(d*f
- c*g))])*(Log[a + b*x] + Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b
*x)))])^2)/g + (B^2*(Log[-((d*(a + b*x))/(b*c - a*d))] + Log[(d*f - c*g)/(d
*(f + g*x))] - Log[-(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])*Log
[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]^2)/g - (B^2*(Log[-((d*(a
+ b*x))/(b*c - a*d))] - Log[-((g*(a + b*x))/(b*f - a*g))])*(Log[c + d*x] +
Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])^2)/g + (2*B^2*(Log[f
+ g*x] - Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2
, -((d*(a + b*x))/(b*c - a*d))])/g + (2*B^2*Log[a + b*x]*PolyLog[2, -((g*(a
 + b*x))/(b*f - a*g))])/g + (2*B^2*(Log[f + g*x] - Log[((b*c - a*d)*(f + g*
x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/g - (2
*B^2*Log[(c + d*x)^(-1)]*PolyLog[2, -((g*(c + d*x))/(d*f - c*g))])/g - (2*B
^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]*PolyLog[2, (g*(a
 + b*x))/(b*(f + g*x))])/g + (2*B^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c
*g)*(a + b*x)))]*PolyLog[2, -(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x
)))])/g - (2*B^2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]*PolyL
og[2, (g*(c + d*x))/(d*(f + g*x))])/g + (2*B^2*Log[((b*c - a*d)*(f + g*x))/
((b*f - a*g)*(c + d*x))]*PolyLog[2, ((b*f - a*g)*(c + d*x))/((b*c - a*d)*(f
```

```
 + g*x))])/g - (2*A*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2*B^2*(Lo
g[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
 (b*(f + g*x))/(b*f - a*g)])/g - (2*B^2*(Log[(c + d*x)^(-1)] + Log[c + d*x]
)*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2*B^2*(Log[c + d*x] + Log[((b
*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(f + g*x))/(b*
f - a*g)])/g + (2*A*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (2*B^2*(Lo
g[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)])/g + (2*B^2*(Log[a + b*x] + Log[-(((b*c - a*d)*
(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)]
)/g - (2*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/g - (2*B^2*PolyLog[3
, -((g*(a + b*x))/(b*f - a*g))])/g - (2*B^2*PolyLog[3, (b*(c + d*x))/(b*c -
 a*d)])/g - (2*B^2*PolyLog[3, -((g*(c + d*x))/(d*f - c*g))])/g - (2*B^2*Pol
yLog[3, (g*(a + b*x))/(b*(f + g*x))])/g + (2*B^2*PolyLog[3, -(((d*f - c*g)*
(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (2*B^2*PolyLog[3, (g*(c + d*x))/(
d*(f + g*x))])/g + (2*B^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((b*c - a*d)*(
f + g*x))])/g - (2*B^2*PolyLog[3, (b*(f + g*x))/(b*f - a*g)])/g - (2*B^2*Po
lyLog[3, (d*(f + g*x))/(d*f - c*g)])/g
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
```

```
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2435

```
Int[(Log[(a_) + (b_.)*(x_)]*Log[(c_) + (d_.)*(x_)])/(x_), x_Symbol] :> Simp
[Log[-((b*x)/a)]*Log[a + b*x]*Log[c + d*x], x] + (Simp[(1*(Log[-((b*x)/a)]
- Log[-(((b*c - a*d)*x)/(a*(c + d*x)))] + Log[(b*c - a*d)/(b*(c + d*x))])*L
og[(a*(c + d*x))/(c*(a + b*x))]^2)/2, x] - Simp[(1*(Log[-((b*x)/a)] - Log[-
((d*x)/c)])*(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])^2)/2, x] + Si
mp[(Log[c + d*x] - Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1 + (b*x)/a
], x] + Simp[(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1
 + (d*x)/c], x] + Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2, (c*(a +
b*x))/(a*(c + d*x))], x] - Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))], x] - Simp[PolyLog[3, 1 + (b*x)/a], x] - Simp
[PolyLog[3, 1 + (d*x)/c], x] + Simp[PolyLog[3, (c*(a + b*x))/(a*(c + d*x))]
, x] - Simp[PolyLog[3, (d*(a + b*x))/(b*(c + d*x))], x]) /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2437

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*Log[(h_.)*((i_.) + (j_.)*(x_))^(m
_.)])/(x_), x_Symbol] :> Dist[m, Int[(Log[i + j*x]*Log[c*(d + e*x)^n])/x, x
], x] - Dist[m*Log[i + j*x] - Log[h*(i + j*x)^m], Int[Log[c*(d + e*x)^n]/x,
 x], x] /; FreeQ[{c, d, e, h, i, j, m, n}, x] && NeQ[e*i - d*j, 0] && NeQ[i
```

```
 + j*x, h*(i + j*x)^m]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{f+gx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{e(a+bx)}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(}{a+bx}}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{(bc-ad)(a+bx)} - \right.}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2bB)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{a+bx}\,dx}{g} + \frac{(2Bd)}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2bB)\int \left(\frac{A\log(f+gx)}{a+bx} + \frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)\log(f+gx)}{a+bx}\right)}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2AbB)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} - \frac{\left(2bB^2\right)\int \frac{\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+b}}{g}$$

$$= -\frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} + 2AB\log$$

$$= -\frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{2B^2\log\left(-\frac{g(a+bx)}{bf-ag}\right)\left(\log(a+bx)+\log\left(\frac{1}{c+dx}\right)\right.}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)}{g}$$

Mathematica [**A**] time = 0.85, size = 431, normalized size = 1.56

$$\frac{2AB\log(f+gx)\log\left(\frac{e(a+bx)}{c+dx}\right)+2AB\text{Li}_2\left(\frac{g(a+bx)}{ag-bf}\right)-2AB\log\left(\frac{a}{b}+x\right)\log(f+gx)+2AB\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(f+g}{bf-a}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x),x]
```

```
[Out] (-(B^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)]) + A^2
*Log[f + g*x] - 2*A*B*Log[a/b + x]*Log[f + g*x] + 2*A*B*Log[c/d + x]*Log[f
+ g*x] + 2*A*B*Log[(e*(a + b*x))/(c + d*x)]*Log[f + g*x] + 2*A*B*Log[a/b +
x]*Log[(b*(f + g*x))/(b*f - a*g)] - 2*A*B*Log[c/d + x]*Log[(d*(f + g*x))/(d
*f - c*g)] + B^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[((b*c - a*d)*(f + g*x))
/((b*f - a*g)*(c + d*x))] + 2*A*B*PolyLog[2, (g*(a + b*x))/(-(b*f) + a*g)]
- 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
] + 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, ((d*f - c*g)*(a + b*x))/(
(b*f - a*g)*(c + d*x))] - 2*A*B*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)] +
2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 2*B^2*PolyLog[3, ((d*f - c*
g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/g
```

fricas [**F**] time = 1.08, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g*x + f), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 0.08, size = 2428, normalized size = 8.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f),x)
```

```
[Out] 2*d*A*B/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln((-a*e*g+b*e*f+(c*g-d
*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*f))/(c*g-d*f)*f*b*c+2*A*B/g/
(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c
)/d*e)*d)/b/e)*b*c-2*d*A*B/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln(-
(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*a+2*d*A*B/(a*d-b*c)*dilog((-a*e
*g+b*e*f+(c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*f))/(c*g-d*f)
*c*a-2*B^2/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*polylog(2,-(c*g-d*f)
/(-a*e*g+b*e*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*b*c+2*A*B/g/(a*d-b*c)*dilog(
-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*b*c+B^2/g/(a*d-b*c)*ln(b/d*e+(
```

```
a*d-b*c)/(d*x+c)/d*e)^2*ln(-(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b*d/e+1)*b*c+2*B^
2/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*polylog(2,(b/d*e+(a*d-b*c)/(d
*x+c)/d*e)/b*d/e)*b*c+d*B^2/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*l
n(1+(c*g-d*f)/(-a*e*g+b*e*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*a-2*d*B^2/g/(a*
d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*polylog(2,(b/d*e+(a*d-b*c)/(d*x+c)/d
*e)/b*d/e)*a-d*B^2/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^2*ln(-(b/d*e
+(a*d-b*c)/(d*x+c)/d*e)/b*d/e+1)*a-2*d^2*A*B/g/(a*d-b*c)*dilog((-a*e*g+b*e*
f+(c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*f))/(c*g-d*f)*f*a+2*
d*A*B/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln((-a*e*g+b*e*f+(c*g-d*f)*
(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*f))/(c*g-d*f)*c*a-2*A*B/(a*d-b*c
)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln((-a*e*g+b*e*f+(c*g-d*f)*(b/d*e+(a*d-b*
c)/(d*x+c)/d*e))/(-a*e*g+b*e*f))/(c*g-d*f)*c^2*b-2*d*B^2/g/(a*d-b*c)*polylo
g(3,-(c*g-d*f)/(-a*e*g+b*e*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*a-d*A^2/g/(a*d
-b*c)*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)*a+d*A^2/g/(a*d-b*c)*ln(-a*e*
g+b*e*f+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c*g-(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d*f
)*a+2*d*B^2/g/(a*d-b*c)*polylog(3,(b/d*e+(a*d-b*c)/(d*x+c)/d*e)/b*d/e)*a-A^
2/g/(a*d-b*c)*ln(-a*e*g+b*e*f+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*c*g-(b/d*e+(a*d
-b*c)/(d*x+c)/d*e)*d*f)*b*c+A^2/g/(a*d-b*c)*ln(-b*e+(b/d*e+(a*d-b*c)/(d*x+c
)/d*e)*d)*b*c+2*d*B^2/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*polylog(2
,-(c*g-d*f)/(-a*e*g+b*e*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*a-2*A*B/(a*d-b*c)
*dilog((-a*e*g+b*e*f+(c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*f
))/(c*g-d*f)*c^2*b-2*B^2/g/(a*d-b*c)*polylog(3,(b/d*e+(a*d-b*c)/(d*x+c)/d*e
)/b*d/e)*b*c+2*B^2/g/(a*d-b*c)*polylog(3,-(c*g-d*f)/(-a*e*g+b*e*f)*(b/d*e+(
a*d-b*c)/(d*x+c)/d*e))*b*c-B^2/g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)^
2*ln(1+(c*g-d*f)/(-a*e*g+b*e*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))*b*c-2*d*A*B/
g/(a*d-b*c)*dilog(-(-b*e+(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*d)/b/e)*a-2*d^2*A*B/
g/(a*d-b*c)*ln(b/d*e+(a*d-b*c)/(d*x+c)/d*e)*ln((-a*e*g+b*e*f+(c*g-d*f)*(b/d
*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*f))/(c*g-d*f)*f*a+2*d*A*B/g/(a*d-b*c
)*dilog((-a*e*g+b*e*f+(c*g-d*f)*(b/d*e+(a*d-b*c)/(d*x+c)/d*e))/(-a*e*g+b*e*
f))/(c*g-d*f)*f*b*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{A^2\log\left(gx+f\right)}{g}-\int-\frac{B^2\log(bx+a)^2+B^2\log(e)^2+2\,AB\log(e)+2\left(B^2\log(e)+AB\right)\log(bx+a)-2\big(B^2\log(}{gx+f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x, algorithm="maxima")
```

```
[Out] A^2*log(g*x + f)/g - integrate(-(B^2*log(b*x + a)^2 + B^2*log(e)^2 + 2*A*B*
log(e) + 2*(B^2*log(e) + A*B)*log(b*x + a) - 2*(B^2*log(b*x + a) + B^2*log(
e) + A*B)*log(d*x + c))/(g*x + f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{f+g\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)\right)^2}{f+gx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f),x)
```

```
[Out] Integral((A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x)))**2/(f + g*x), x)
```

3.245 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^2}\,dx$

Optimal. Leaf size=196

$$\frac{2B(bc-ad)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{(bf-ag)(df-cg)}+\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{(f+gx)(bf-ag)}+\frac{2B^2(bc-ad)\mathrm{Li}_2\left(\frac{(df-cg}{(bf-ag}\right.}{(bf-ag)(df-cg}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/(-a*g+b*f)/(g*x+f)+2*B*(-a*d+b*c)*(A+
B*ln(e*(b*x+a)/(d*x+c)))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+
b*f)/(-c*g+d*f)+2*B^2*(-a*d+b*c)*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d
*x+c))/(-a*g+b*f)/(-c*g+d*f)
```

Rubi [**B**] time = 1.12, antiderivative size = 612, normalized size of antiderivative = 3.12, number of steps used = 32, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2bB^2\mathrm{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g(bf-ag)}+\frac{2B^2d\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g(df-cg)}-\frac{2B^2(bc-ad)\mathrm{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{(bf-ag)(df-cg)}+\frac{2B^2(bc-ad)\mathrm{PolyLog}}{(bf-ag)(df}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^2,x]
```

```
[Out] -((b*B^2*Log[a + b*x]^2)/(g*(b*f - a*g))) + (2*b*B*Log[a + b*x]*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x))/(c +
d*x)])^2/(g*(f + g*x)) + (2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
 d*x])/(g*(d*f - c*g)) - (2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x])/(g*(d*f - c*g)) - (B^2*d*Log[c + d*x]^2)/(g*(d*f - c*g)) + (2*b*B^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g)) - (2*B^2*(b*c
 - a*d)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)*(d*f -
 c*g)) + (2*B*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x]
)/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(b*c - a*d)*Log[-((g*(c + d*x))/(d*f -
 c*g))]*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (2*b*B^2*PolyLog[2, -((d*
(a + b*x))/(b*c - a*d))])/(g*(b*f - a*g)) + (2*B^2*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(g*(d*f - c*g)) - (2*B^2*(b*c - a*d)*PolyLog[2, (b*(f + g*
x))/(b*f - a*g)])/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(b*c - a*d)*PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)])/((b*f - a*g)*(d*f - c*g))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad))\int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(-df+cg)(c+dx}\right.}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{\left(2b^2B\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{g(bf-ag)} - \frac{\left(2Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,d}{g(df-cg)}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\right.}{g(}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\right.}{g(}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\right.}{g(}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\right.}{g(}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{2B^2d\log\left(-\frac{d(a+}{bc-}\right.}{g(df}$$

$$= -\frac{bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{g(f+gx)}$$

$$= -\frac{bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{g(f+gx)}$$

Mathematica [B] time = 0.58, size = 402, normalized size = 2.05

$$\frac{B\left(2b\log(a+bx)(df-cg)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2d(bf-ag)\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2g(bc-ad)\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-bB(df-cg)\left(\log(a+bx\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)) + (B*(2*b*(d*f - c*g)*
Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(b*f - a*g)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*(b*c - a*d)*g*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[f + g*x] - b*B*(d*f - c*g)*(Log[a + b*x]*(Log[a
+ b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(
b*c) + a*d)]) + B*d*(b*f - a*g)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
```

```
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 2*B*(b
*c - a*d)*g*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f)
 + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)*(d*f - c*g)))/g
```

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{g^2x^2+2\,fgx+f^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^2*x^2 + 2*f*g*x + f^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.80, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(gx+f\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^2,x)
```

```
[Out] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,AB\left(\frac{b\log(bx+a)}{bfg-ag^2}-\frac{d\log(dx+c)}{dfg-cg^2}+\frac{(bc-ad)\log\left(gx+f\right)}{bdf^2+acg^2-(bc+ad)fg}-\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{g^2x+fg}\right)-B^2\left(\frac{\log(dx+c)^2}{g^2x+fg}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] 2*A*B*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) + (b
*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b*e*x/(d
*x + c) + a*e/(d*x + c))/(g^2*x + f*g)) - B^2*(log(d*x + c)^2/(g^2*x + f*g)
 + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + (d*g*x + c*g)*log(b*x + a)^2
 + 2*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 2*((g*log(e) - g)*d*x + c*g
*log(e) - d*f + (d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(d*g^3*x^3 + c*f^
2*g + (2*d*f*g^2 + c*g^3)*x^2 + (d*f^2*g + 2*c*f*g^2)*x), x)) - A^2/(g^2*x
+ f*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}{{\left(f+g\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**2,x)
```

```
[Out] Timed out
```

3.246 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^3}\,dx$

Optimal. Leaf size=369

$$\frac{b^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g(bf-ag)^2}+\frac{Bg(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{(f+gx)(bf-ag)^2(df-cg)}+\frac{B(bc-ad)(-adg-bcg+2bdf)\log\left(1-\right.}{(bf-ag)^2(d}$$

```
[Out] B*(-a*d+b*c)*g*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*g+b*f)^2/(-c*g+d*f)/
(g*x+f)+1/2*b^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g/(-a*g+b*f)^2-1/2*(A+B*ln(e*
(b*x+a)/(d*x+c)))^2/g/(g*x+f)^2+B^2*(-a*d+b*c)^2*g*ln((g*x+f)/(d*x+c))/(-a*
g+b*f)^2/(-c*g+d*f)^2+B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(A+B*ln(e*(b*x+a)
/(d*x+c)))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^2/(-c*g+d
*f)^2+B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*polylog(2,(-c*g+d*f)*(b*x+a)/(-
a*g+b*f)/(d*x+c))/(-a*g+b*f)^2/(-c*g+d*f)^2
```

Rubi [B] time = 1.48, antiderivative size = 883, normalized size of antiderivative = 2.39, number of steps used = 36, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2\log^2(a+bx)b^2}{2g(bf-ag)^2}+\frac{B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^2}{g(bf-ag)^2}+\frac{B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^2}{g(bf-ag)^2}+\frac{B^2\text{PolyLog}\left(2,-\right.}{g(bf-a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^3,x]
```

```
[Out] (b*B^2*(b*c - a*d)*Log[a + b*x])/((b*f - a*g)^2*(d*f - c*g)) - (b^2*B^2*Log
[a + b*x]^2)/(2*g*(b*f - a*g)^2) - (B*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/((b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*Log[a + b*x]*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*
x))/(c + d*x)])^2/(2*g*(f + g*x)^2) - (B^2*d*(b*c - a*d)*Log[c + d*x])/((b*
f - a*g)*(d*f - c*g)^2) + (B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/(g*(d*f - c*g)^2) - (B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x])/(g*(d*f - c*g)^2) - (B^2*d^2*Log[c + d*x]^2)/(2*g*(d*f - c*g)^2)
 + (b^2*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g)^2)
+ (B^2*(b*c - a*d)^2*g*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) - (B^2*(
b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[
f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x])/((b*f - a*g)^2*(
d*f - c*g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[-((g*(c + d*
x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (b^2*B^2*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f - a*g)^2) + (B^2*d^2*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*g)^2) - (B^2*(b*c - a*d)*(2*b*
d*f - b*c*g - a*d*g)*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)^2*
(d*f - c*g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLog[2, (d*(
f + g*x))/(d*f - c*g)])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
```

```
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2}+\frac{B\int\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2}+\frac{(B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2}+\frac{(B(bc-ad))\int\left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{(bc-ad)(-df+cg)^2(}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2}+\frac{\left(b^3B\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{g(bf-ag)^2}-\frac{\left(Bd^3\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,d}{g(df-cg)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)^2}-$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)^2}-$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)^2}-$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)}{g(b}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)}{g(b}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{b^2B^2\log^2(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(bf-ag)(df-cg)(f+gx)}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{b^2B^2\log^2(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{(bf-ag)(df-cg)(f+gx)}$$

Mathematica [A] time = 1.54, size = 595, normalized size = 1.61

$$-\frac{\frac{B(f+gx)\left(-2b^2(f+gx)\log(a+bx)(df-cg)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2d^2(f+gx)(bf-ag)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+2g(bc-ad)(bf-ag)(df-cg)\left(B\,l\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^3,x]
```

```
[Out] -1/2*((A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(f + g*x)*(2*(b*c - a*d)*
g*(b*f - a*g)*(d*f - c*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b^2*(d*f
 - c*g)^2*(f + g*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d
^2*(b*f - a*g)^2*(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x
] + 2*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*Log[(e*(a +
 b*x))/(c + d*x)])*Log[f + g*x] - 2*B*(b*c - a*d)*g*(f + g*x)*(b*(d*f - c*g
)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*
x]) + b^2*B*(d*f - c*g)^2*(f + g*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*
(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - B*
d^2*(b*f - a*g)^2*(f + g*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
 d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 2*B*(b*c -
 a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*((Log[(g*(a + b*x))/(-(b*f) +
a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f
+ g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g
)^2*(d*f - c*g)^2))/(g*(f + g*x)^2)
```

fricas [F] time = 0.90, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^{2}\log\left(\frac{bex+ae}{dx+c}\right)^{2}+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^{2}}{g^{3}x^{3}+3\,fg^{2}x^{2}+3\,f^{2}gx+f^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^3*x^3 + 3*f*g^2*x^2 + 3*f^2*g*x + f^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 2.73, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}{\left(gx+f\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^3,x)
```

```
[Out] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(\frac{b^{2}\log\left(bx+a\right)}{b^{2}f^{2}g-2\,abfg^{2}+a^{2}g^{3}}-\frac{d^{2}\log\left(dx+c\right)}{d^{2}f^{2}g-2\,cdfg^{2}+c^{2}g^{3}}+\frac{\left(2\left(b^{2}cd-abd^{2}\right)f-\left(b^{2}c^{2}-a^{2}d^{2}\right)g\right)\mathrm{lo}}{b^{2}d^{2}f^{4}+a^{2}c^{2}g^{4}-2\left(b^{2}cd+abd^{2}\right)f^{3}g+\left(b^{2}c^{2}+4\,abcd+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] (b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c)/(d
^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2 - a
^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d^2)*
f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)*f*g
^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g + a
*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b*e*x/(d*x + c) + a*e/(d*x + c))/(g^3*
x^2 + 2*f*g^2*x + f^2*g))*A*B - 1/2*B^2*(log(d*x + c)^2/(g^3*x^2 + 2*f*g^2*
x + f^2*g) + 2*integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + (d*g*x + c*g)*lo
g(b*x + a)^2 + 2*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - ((2*g*log(e) -
g)*d*x + 2*c*g*log(e) - d*f + 2*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(
d*g^4*x^4 + c*f^3*g + (3*d*f*g^3 + c*g^4)*x^3 + 3*(d*f^2*g^2 + c*f*g^3)*x^2
 + (d*f^3*g + 3*c*f^2*g^2)*x), x)) - 1/2*A^2/(g^3*x^2 + 2*f*g^2*x + f^2*g)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{\left(f+g\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^3, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**3,x)
```

```
[Out] Timed out
```

3.247 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^4}\,dx$

Optimal. Leaf size=714

$$\frac{2B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3(bf-ag)^3(df-cg)^3}+$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*g^2*(d*x+c)/(-a*g+b*f)^2/(-c*g+d*f)^3/(g*x+f)+1/3*B^2*
(-a*d+b*c)^3*g^2*ln((b*x+a)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3-1/3*B*(-a*d+
b*c)*g^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*g+b*f)/(-c*g+d*f)^3/(g*x
+f)^2+2/3*B*(-a*d+b*c)*g*(-2*a*d*g-b*c*g+3*b*d*f)*(b*x+a)*(A+B*ln(e*(b*x+a)
/(d*x+c)))/(-a*g+b*f)^3/(-c*g+d*f)^2/(g*x+f)+1/3*b^3*(A+B*ln(e*(b*x+a)/(d*x
+c)))^2/g/(-a*g+b*f)^3-1/3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g/(g*x+f)^3-1/3*B^
2*(-a*d+b*c)^3*g^2*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3+2/3*B^2*(-
a*d+b*c)^2*g*(-2*a*d*g-b*c*g+3*b*d*f)*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^3/(-c*
g+d*f)^3+2/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*
c*d*f*g+3*d^2*f^2))*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-(-c*g+d*f)*(b*x+a)/(-a
*g+b*f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3+2/3*B^2*(-a*d+b*c)*(a^2*d^2*g^2-
a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))*polylog(2,(-c*g+d*f
)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3
```

Rubi [A] time = 2.38, antiderivative size = 1356, normalized size of antiderivative = 1.90, number of steps used = 40, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2\log^2(a+bx)b^3}{3g(bf-ag)^3}+\frac{2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^3}{3g(bf-ag)^3}+\frac{2B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^3}{3g(bf-ag)^3}+\frac{2B^2\text{PolyLog}\left(2,-\right.}{3g(bf-a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^4,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^2*B^2
*(b*c - a*d)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)) + (2*b*B^2*(b*c -
a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)^2
) - (b^3*B^2*Log[a + b*x]^2)/(3*g*(b*f - a*g)^3) - (B*(b*c - a*d)*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (2*B
*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*b^3*B*Log[a + b*x]*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x
))/(c + d*x)])^2/(3*g*(f + g*x)^3) - (B^2*d^2*(b*c - a*d)*Log[c + d*x])/(3*
(b*f - a*g)*(d*f - c*g)^3) - (2*B^2*d*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)
*Log[c + d*x])/(3*(b*f - a*g)^2*(d*f - c*g)^3) + (2*B^2*d^3*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/(3*g*(d*f - c*g)^3) - (2*B*d^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*g*(d*f - c*g)^3) - (B^2*d^3*Log[
c + d*x]^2)/(3*g*(d*f - c*g)^3) + (2*b^3*B^2*Log[a + b*x]*Log[(b*(c + d*x))
/(b*c - a*d)])/(3*g*(b*f - a*g)^3) + (B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g
- a*d*g)*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3) - (2*B^2*(b*c - a*d)*(
a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)
)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c
*g)^3) + (2*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2
*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g
*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*
b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[-((g*(c +
d*x))/(d*f - c*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*b^3*
```

```
B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*g*(b*f - a*g)^3) + (2*B^2*
d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*g*(d*f - c*g)^3) - (2*B^2*(b*
c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g
+ c^2*g^2))*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/(3*(b*f - a*g)^3*(d*f -
c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*
d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/(3*(
b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3}+\frac{(2B)\int\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3}+\frac{(2B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3}+\frac{(2B(bc-ad))\int\left(\frac{b^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)^3(a+bx)}+\frac{d^4\left(A+B\log\left(\frac{e(a}{c}\right.\right.}{(bc-ad)(-df+cg)^3}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3}+\frac{\left(2b^4B\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{3g(bf-ag)^3}-\frac{\left(2Bd^4\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right.}{c+dx}}{3g(df-cg)^3}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2}-\frac{2B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2}-\frac{2B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2}-\frac{2B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)}+\frac{2bB^2(bc-ad)(}{3(b}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)}+\frac{2bB^2(bc-ad)(}{3(b}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)}+\frac{2bB^2(bc-ad)(}{3(b}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)}+\frac{2bB^2(bc-ad)(}{3(b}$$

Mathematica [A] time = 3.18, size = 894, normalized size = 1.25

$$-\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2+\frac{B(f+gx)\left(2d^3(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)(bf-ag)^3-Bd^3(f+gx)^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^4,x]
```

```
[Out] -1/3*((A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(f + g*x)*((b*c - a*d)*g*
(b*f - a*g)^2*(d*f - c*g)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c -
 a*d)*g*(b*f - a*g)*(-(d*f) + c*g)*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A
+ B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b^3*(d*f - c*g)^3*(f + g*x)^2*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d^3*(b*f - a*g)^3*(f + g*x)^
2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*(b*c - a*d)*g*(a^2*
```

```
d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(
f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x] - 2*B*(b*c - a
*d)*g*(2*b*d*f - b*c*g - a*d*g)*(f + g*x)^2*(b*(d*f - c*g)*Log[a + b*x] + (
-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]) + B*(b*c - a*d
)*g*(f + g*x)*((b*c - a*d)*g*(b*f - a*g)*(d*f - c*g) - b^2*(d*f - c*g)^2*(f
 + g*x)*Log[a + b*x] + d^2*(b*f - a*g)^2*(f + g*x)*Log[c + d*x] + (b*c - a*
d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*Log[f + g*x]) + b^3*B*(d*f - c*g)
^3*(f + g*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d
)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - B*d^3*(b*f - a*g)^3*(f
+ g*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*B*(b*c - a*d)*g*(a^2*d^2*g^
2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(f + g*
x)^2*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)
])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f
+ g*x))/(d*f - c*g)])))/((b*f - a*g)^3*(d*f - c*g)^3))/(g*(f + g*x)^3)
```

fricas [F] time = 1.16, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{B^{2} \log\left(\frac{bex+ae}{dx+c}\right)^{2} + 2\,AB \log\left(\frac{bex+ae}{dx+c}\right) + A^{2}}{g^{4}x^{4} + 4\,fg^{3}x^{3} + 6\,f^{2}g^{2}x^{2} + 4\,f^{3}gx + f^{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^4*x^4 + 4*f*g^3*x^3 + 6*f^2*g^2*x^2 + 4*f^3*g*x + f^4), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 4.24, size = 0, normalized size = 0.00

$$\int \frac{\left(B \ln\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^{2}}{\left(gx+f\right)^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^4,x)
```

```
[Out] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
```

```
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - 2*log(b*e*x/(d*x + c) + a*e/(d*
x + c))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*A*B - 1/3*B^2*(log(d
*x + c)^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) + 3*integrate(-1/3*
(3*d*g*x*log(e)^2 + 3*c*g*log(e)^2 + 3*(d*g*x + c*g)*log(b*x + a)^2 + 6*(d*
g*x*log(e) + c*g*log(e))*log(b*x + a) - 2*((3*g*log(e) - g)*d*x + 3*c*g*log
(e) - d*f + 3*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(d*g^5*x^5 + c*f^4*
g + (4*d*f*g^4 + c*g^5)*x^4 + 2*(3*d*f^2*g^3 + 2*c*f*g^4)*x^3 + 2*(2*d*f^3*
g^2 + 3*c*f^2*g^3)*x^2 + (d*f^4*g + 4*c*f^3*g^2)*x), x)) - 1/3*A^2/(g^4*x^3
 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}{{\left(f+g\,x\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^4,x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**4,x)
```

```
[Out] Timed out
```

3.248 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^5}\,dx$

Optimal. Leaf size=1159

$$\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 b^4}{4g(bf-ag)^4}-\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4}+\frac{B^2(bc-ad)^3g^2(4bdf-bcg-3adg)\log\left(\frac{a+bx}{c+dx}\right)}{4(bf-ag)^4(df-cg)^4}-\frac{B^2(bc-ad)^4g}{6(bf-ag)^4\left(\right.}$$

```
[Out] -1/12*B^2*(-a*d+b*c)^2*g^3*(d*x+c)^2/(-a*g+b*f)^2/(-c*g+d*f)^4/(g*x+f)^2-1/
6*B^2*(-a*d+b*c)^3*g^3*(d*x+c)/(-a*g+b*f)^3/(-c*g+d*f)^4/(g*x+f)+1/4*B^2*(-
a*d+b*c)^2*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*(d*x+c)/(-a*g+b*f)^3/(-c*g+d*f)^4/(
g*x+f)-1/6*B^2*(-a*d+b*c)^4*g^3*ln((b*x+a)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)
^4+1/4*B^2*(-a*d+b*c)^3*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*ln((b*x+a)/(d*x+c))/(-
a*g+b*f)^4/(-c*g+d*f)^4+1/6*B*(-a*d+b*c)*g^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)/(d
*x+c)))/(-a*g+b*f)/(-c*g+d*f)^4/(g*x+f)^3-1/4*B*(-a*d+b*c)*g^2*(-3*a*d*g-b*
c*g+4*b*d*f)*(d*x+c)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*g+b*f)^2/(-c*g+d*f)^
4/(g*x+f)^2+1/2*B*(-a*d+b*c)*g*(3*a^2*d^2*g^2-2*a*b*d*g*(-c*g+4*d*f)+b^2*(c
^2*g^2-4*c*d*f*g+6*d^2*f^2))*(b*x+a)*(A+B*ln(e*(b*x+a)/(d*x+c)))/(-a*g+b*f)
^4/(-c*g+d*f)^3/(g*x+f)+1/4*b^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g/(-a*g+b*f)^
4-1/4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2/g/(g*x+f)^4+1/6*B^2*(-a*d+b*c)^4*g^3*ln
((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-1/4*B^2*(-a*d+b*c)^3*g^2*(-3*a*
d*g-b*c*g+4*b*d*f)*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4+1/2*B^2*(-
a*d+b*c)^2*g*(3*a^2*d^2*g^2-2*a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*g+6
*d^2*f^2))*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-1/2*B*(-a*d+b*c)*(
-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d
^2*f^2))*(A+B*ln(e*(b*x+a)/(d*x+c)))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*
x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-1/2*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(
2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*polylog(2,(-c*
g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4
```

Rubi **[A]** time = 3.40, antiderivative size = 1881, normalized size of antiderivative = 1.62, number of steps used = 44, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g)/(12*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (5*B^
2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g))/(12*(b*f - a*g)^3*(d*f - c*g)^
3*(f + g*x)) + (b^3*B^2*(b*c - a*d)*Log[a + b*x])/(6*(b*f - a*g)^4*(d*f - c
*g)) + (b^2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/(4*(b*f
 - a*g)^4*(d*f - c*g)^2) + (b*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f
 - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[a + b*x])/(2*(b*f - a*
g)^4*(d*f - c*g)^3) - (b^4*B^2*Log[a + b*x]^2)/(4*g*(b*f - a*g)^4) - (B*(b*
c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*(b*f - a*g)*(d*f - c*g)*(
f + g*x)^3) - (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(4*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*(b*c - a
*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2
*g^2))*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*f - a*g)^3*(d*f - c*g)^3
*(f + g*x)) + (b^4*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*
g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(4*g*(f + g*x)^4)
 - (B^2*d^3*(b*c - a*d)*Log[c + d*x])/(6*(b*f - a*g)*(d*f - c*g)^4) - (B^2*
d^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(4*(b*f - a*g)^2*(d
*f - c*g)^4) - (B^2*d*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^
2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[c + d*x])/(2*(b*f - a*g)^3*(d*f -
```

```
c*g)^4) + (B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*g*(d*
f - c*g)^4) - (B*d^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(2*
g*(d*f - c*g)^4) - (B^2*d^4*Log[c + d*x]^2)/(4*g*(d*f - c*g)^4) + (b^4*B^2*
Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*g*(b*f - a*g)^4) + (B^2*(b*
c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)^2*Log[f + g*x])/(4*(b*f - a*g)^4*(d*
f - c*g)^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
 b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a*g)^4*(d*f
 - c*g)^4) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^
2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[-((g*(a + b*x))/(b*f
 - a*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c - a*d)*(2
*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c
*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x])/(2*(b
*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*
a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[-((g
*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) + (
b^4*B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*g*(b*f - a*g)^4) + (B^
2*d^4*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*g*(d*f - c*g)^4) + (B^2*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^
2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/(2*(b*
f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a
*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2
, (d*(f + g*x))/(d*f - c*g)])/(2*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{B\int\frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int\left(\frac{b^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{(bc-ad)(-df+cg)^4(c}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{\left(b^5B\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{2g(bf-ag)^4} - \frac{\left(Bd^5\right)\int\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,d}{2g(df-cg)^4}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\right.}{4(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\right.}{4(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\right.}{4(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B}{6}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B}{6}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B}{6}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B}{6}$$

Mathematica [A] time = 7.42, size = 1448, normalized size = 1.25

$$\frac{B(bc-ad)\left(\frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^4}{(bc-ad)(bf-ag)^4} - \frac{B\left(\log^2(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a+bx)-2\mathrm{Li}_2\left(-\frac{d(a+bx)}{bc-ad}\right)\right)b^4}{2(bc-ad)(bf-ag)^4} - \frac{g\left(\left(3d^2f^2-3cdgf+c^2g^2\right)b^2-ad\right.}{(bf-ag}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^5,x]
```

```
[Out] -1/4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(g*(f + g*x)^4) + (B*(b*c - a*d
)*(-1/3*(g*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*f - a*g)*(d*f - c*g)*(
f + g*x)^3) - (g*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 - a*b*d
*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a
```

```
+ b*x))/(c + d*x)]))/((b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)*(b*f - a*g)^4) - (
d^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)*(d*f -
c*g)^4) + (g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 - 2*b^2*c*d*f*g - 2*a
*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) + (B*(b*c - a*d)*g*(a^2*d^2*g
^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*((b*Log
[a + b*x])/((b*c - a*d)*(b*f - a*g)) - (d*Log[c + d*x])/((b*c - a*d)*(d*f -
 c*g)) + (g*Log[f + g*x])/((b*f - a*g)*(d*f - c*g))))/((b*f - a*g)^3*(d*f -
 c*g)^3) - (B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*(g/((b*f - a*g)*(d*f
- c*g)*(f + g*x)) - (b^2*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + (d^2*L
og[c + d*x])/((b*c - a*d)*(d*f - c*g)^2) - (g*(2*b*d*f - b*c*g - a*d*g)*Log
[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)))/(2*(b*f - a*g)^2*(d*f - c*g)^2)
- (B*(b*c - a*d)*g*(g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (2*g*(2*b*d*f
 - b*c*g - a*d*g))/((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) - (2*b^3*Log[a +
 b*x])/((b*c - a*d)*(b*f - a*g)^3) + (2*d^3*Log[c + d*x])/((b*c - a*d)*(d*f
 - c*g)^3) - (2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3
*c*d*f*g + c^2*g^2))*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(6*(b*f
- a*g)*(d*f - c*g)) - (b^4*B*(Log[a + b*x]^2 - 2*Log[a + b*x]*Log[(b*(c + d
*x))/(b*c - a*d)] - 2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]))/(2*(b*c -
a*d)*(b*f - a*g)^4) + (B*d^4*(2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d
*x] - Log[c + d*x]^2 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(b*c -
a*d)*(d*f - c*g)^4) - (B*g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 - 2*b^2
*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(Log[-((g*(a + b*x))/
(b*f - a*g))]*Log[f + g*x] - Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x]
 + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f -
c*g)]))/((b*f - a*g)^4*(d*f - c*g)^4)))/(2*g)
```

fricas [F] time = 1.21, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,AB\log\left(\frac{bex+ae}{dx+c}\right) + A^2}{g^5x^5 + 5\,fg^4x^4 + 10\,f^2g^3x^3 + 10\,f^3g^2x^2 + 5\,f^4gx + f^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^5*x^5 + 5*f*g^4*x^4 + 10*f^2*g^3*x^3 + 10*f^3*g^2*x^2 + 5*
f^4*g*x + f^5), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 6.98, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}{\left(gx+f\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^5,x)
```

```
[Out] int((B*ln((b*x+a)/(d*x+c)*e)+A)^2/(g*x+f)^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/12*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 6*log(b*e*x/(d*x + c) + a*
e/(d*x + c))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g))
*A*B - 1/4*B^2*(log(d*x + c)^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f
^3*g^2*x + f^4*g) + 4*integrate(-1/2*(2*d*g*x*log(e)^2 + 2*c*g*log(e)^2 + 2
*(d*g*x + c*g)*log(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a)
- ((4*g*log(e) - g)*d*x + 4*c*g*log(e) - d*f + 4*(d*g*x + c*g)*log(b*x + a)
)*log(d*x + c))/(d*g^6*x^6 + c*f^5*g + (5*d*f*g^5 + c*g^6)*x^5 + 5*(2*d*f^2
*g^4 + c*f*g^5)*x^4 + 10*(d*f^3*g^3 + c*f^2*g^4)*x^3 + 5*(d*f^4*g^2 + 2*c*f
^3*g^3)*x^2 + (d*f^5*g + 5*c*f^4*g^2)*x), x)) - 1/4*A^2/(g^5*x^4 + 4*f*g^4*
x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)^2}{{\left(f+g\,x\right)}^5} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^5,x)
```

```
[Out] int((A + B*log((e*(a + b*x))/(c + d*x)))^2/(f + g*x)^5, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**5,x)
```

```
[Out] Timed out
```

3.249 $\int \frac{\log\left(\frac{1+x}{-1+x}\right)}{x^2}\,dx$

Optimal. Leaf size=35

$$2\log\left(-\frac{x}{1-x}\right)-\frac{(x+1)\log\left(-\frac{x+1}{1-x}\right)}{x}$$

```
[Out] 2*ln(-x/(1-x))-(1+x)*ln((-1-x)/(1-x))/x
```

Rubi [A] time = 0.01, antiderivative size = 34, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {2490, 36, 29, 31}

$$2\log(x)-2\log(x+1)-\frac{(1-x)\log\left(-\frac{x+1}{1-x}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(1 + x)/(-1 + x)]/x^2,x]
```

```
[Out] 2*Log[x] - 2*Log[1 + x] - ((1 - x)*Log[-((1 + x)/(1 - x))])/x
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rubi steps

$$\begin{aligned}\int \frac{\log\left(\frac{1+x}{-1+x}\right)}{x^2}\,dx &= -\frac{(1-x)\log\left(-\frac{1+x}{1-x}\right)}{x} + 2\int \frac{1}{x(1+x)}\,dx \\ &= -\frac{(1-x)\log\left(-\frac{1+x}{1-x}\right)}{x} + 2\int \frac{1}{x}\,dx - 2\int \frac{1}{1+x}\,dx \\ &= 2\log(x) - 2\log(1+x) - \frac{(1-x)\log\left(-\frac{1+x}{1-x}\right)}{x}\end{aligned}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 0.86

$$-\log\left(1-x^2\right) + 2\log(x) - \frac{\log\left(\frac{x+1}{x-1}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(1 + x)/(-1 + x)]/x^2,x]
```

```
[Out] 2*Log[x] - Log[(1 + x)/(-1 + x)]/x - Log[1 - x^2]
```

fricas [A] time = 1.00, size = 29, normalized size = 0.83

$$-\frac{x\log\left(x^2-1\right) - 2\,x\log(x) + \log\left(\frac{x+1}{x-1}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((1+x)/(-1+x))/x^2,x, algorithm="fricas")
```

```
[Out] -(x*log(x^2 - 1) - 2*x*log(x) + log((x + 1)/(x - 1)))/x
```

giac [B] time = 0.42, size = 103, normalized size = 2.94

$$\frac{2\,\log\left(\frac{\frac{\frac{x+1}{x-1}+1}{\frac{x+1}{x-1}-1}+1}{\frac{\frac{x+1}{x-1}+1}{\frac{x+1}{x-1}-1}-1}\right)}{\frac{x+1}{x-1}+1} - 2\,\log\left(\frac{|x+1|}{|x-1|}\right) + 2\,\log\left(\left|\frac{x+1}{x-1}+1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((1+x)/(-1+x))/x^2,x, algorithm="giac")
```

```
[Out] 2*log((((x + 1)/(x - 1) + 1)/((x + 1)/(x - 1) - 1) + 1)/(((x + 1)/(x - 1) +
 1)/((x + 1)/(x - 1) - 1) - 1))/((x + 1)/(x - 1) + 1) - 2*log(abs(x + 1)/ab
s(x - 1)) + 2*log(abs((x + 1)/(x - 1) + 1))
```

maple [A] time = 0.10, size = 46, normalized size = 1.31

$$-\frac{2\left(1+\frac{2}{x-1}\right)\ln\left(1+\frac{2}{x-1}\right)}{\frac{2}{x-1}+2} + 2\ln\left(\frac{2}{x-1}+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((x+1)/(x-1))/x^2,x)
```

```
[Out] 2*ln(2/(x-1)+2)-2*ln(1+2/(x-1))*(1+2/(x-1))/(2/(x-1)+2)
```

maxima [**A**] time = 0.48, size = 32, normalized size = 0.91

$$-\frac{\log\left(\frac{x+1}{x-1}\right)}{x} - \log\left(x+1\right) - \log\left(x-1\right) + 2\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((1+x)/(-1+x))/x^2,x, algorithm="maxima")
[Out] -log((x + 1)/(x - 1))/x - log(x + 1) - log(x - 1) + 2*log(x)
```

mupad [**B**] time = 0.19, size = 28, normalized size = 0.80

$$2\ln(x) - \ln\left(x^2-1\right) - \frac{\ln\left(\frac{x+1}{x-1}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log((x + 1)/(x - 1))/x^2,x)
[Out] 2*log(x) - log(x^2 - 1) - log((x + 1)/(x - 1))/x
```

sympy [**A**] time = 0.15, size = 20, normalized size = 0.57

$$2\log\left(x\right) - \log\left(x^2-1\right) - \frac{\log\left(\frac{x+1}{x-1}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((1+x)/(-1+x))/x**2,x)
[Out] 2*log(x) - log(x**2 - 1) - log((x + 1)/(x - 1))/x
```

3.250 $\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=32

$$\mathrm{Int}\left(\frac{(f+gx)^2}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable((g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + 2*f*g*Defer[
Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x] + g^2*Defer[Int][x^2/(A + B
*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int\left(\frac{f^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{2fgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{g^2x^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= f^2\int\frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+(2fg)\int\frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+g^2\int\frac{x^2}{A+B\log\left(\frac{e(a}{c}\right.}\end{aligned}$$

Mathematica [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

fricas [A] time = 0.75, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.15, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
[Out] int((g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
[Out] integrate((g*x + f)^2/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(f+g\,x\right)^{2}}{A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x))),x)
[Out] int((f + g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(f+gx\right)^{2}}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
[Out] Integral((f + g*x)**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)
```

3.251 $\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=30

$$\text{Int}\left(\frac{f+gx}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + g*Defer[Int][x
/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{f}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= f\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+g\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

fricas [A] time = 0.90, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{gx+f}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

giac [**F(-1)**]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
[Out] Timed out
```

maple [**A**]   time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
[Out] int((g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
[Out] integrate((g*x + f)/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

mupad [**A**]   time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f+g\,x}{A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)/(A + B*log((e*(a + b*x))/(c + d*x))),x)
[Out] int((f + g*x)/(A + B*log((e*(a + b*x))/(c + d*x))), x)
```

sympy [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
[Out] Integral((f + g*x)/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)
```

3.252 $\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=24

$$\mathrm{Int}\left(\frac{1}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable(1/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1),x]
```

```
[Out] Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x]
```

Rubi steps

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx=\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Mathematica [A] time = 0.02, size = 0, normalized size = 0.00

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x]
```

fricas [A] time = 0.98, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.92, size = 0, normalized size = 0.00

$$\int \frac{1}{B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int(1/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A + B*log((e*(a + b*x))/(c + d*x))),x)
```

```
[Out] int(1/(A + B*log((e*(a + b*x))/(c + d*x))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Integral(1/(A + B*log(e*(a + b*x)/(c + d*x))), x)
```

3.253 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.90, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

fricas [A] time = 0.89, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Agx+Af+\left(Bgx+Bf\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
[Out] integral(1/(A*g*x + A*f + (B*g*x + B*f)*log((b*e*x + a*e)/(d*x + c))), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int(1/(g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))),x)
```

```
[Out] int(1/((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)\right)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Integral(1/((A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x)))*(f + g*x)), x)
```

3.254 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

fricas [A] time = 0.75, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ag^2x^2+2\,Afgx+Af^2+\left(Bg^2x^2+2\,Bfgx+Bf^2\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
[Out] integral(1/(A*g^2*x^2 + 2*A*f*g*x + A*f^2 + (B*g^2*x^2 + 2*B*f*g*x + B*f^2)
*log((b*e*x + a*e)/(d*x + c))), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
[Out] int(1/(g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)^{2}\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))),x)
[Out] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)\right)\left(f+gx\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
[Out] Integral(1/((A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x)))*(f + g*x)**2), x)
```

3.255 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 8.15, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

fricas [A] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ag^3x^3+3\,Afg^2x^2+3\,Af^2gx+Af^3+\left(Bg^3x^3+3\,Bfg^2x^2+3\,Bf^2gx+Bf^3\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
[Out] integral(1/(A*g^3*x^3 + 3*A*f*g^2*x^2 + 3*A*f^2*g*x + A*f^3 + (B*g^3*x^3 +
3*B*f*g^2*x^2 + 3*B*f^2*g*x + B*f^3)*log((b*e*x + a*e)/(d*x + c))), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3} \left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

```
[Out] int(1/(g*x+f)^3/(B*ln((b*x+a)/(d*x+c)*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3} \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))),x)
```

```
[Out] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

3.256 $\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\mathrm{Int}\left(\frac{(f+gx)^2}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + 2*f*g*Defer[
Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x] + g^2*Defer[Int][x^2/(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{f^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{2fgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx\\ &= f^2\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+(2fg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+g^2\int\end{aligned}$$

Mathematica [A] time = 1.37, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

fricas [A] time = 0.89, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*
A*B*log((b*e*x + a*e)/(d*x + c)) + A^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdg^{2}x^{4}+acf^{2}+\left(adg^{2}+\left(2\,dfg+cg^{2}\right)b\right)x^{3}+\left(\left(2\,dfg+cg^{2}\right)a+\left(df^{2}+2\,cfg\right)b\right)x^{2}+\left(bcf^{2}+\left(df^{2}+2\,cfg\right)\right.}{(bc-ad)B^{2}\log\left(bx+a\right)-(bc-ad)B^{2}\log\left(dx+c\right)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*g^2*x^4 + a*c*f^2 + (a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^3 + ((2*d*f*g +
 c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x^2 + (b*c*f^2 + (d*f^2 + 2*c*f*g)*a)*x)/(
(b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A
*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate((4*b*d*g^2*x^3 + b*c*f^2 +
3*(a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^2 + (d*f^2 + 2*c*f*g)*a + 2*((2*d*f*g +
 c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c -
a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2), x
)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(f+g\,x\right)}^2}{{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((f + g*x)^2/(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{acf^{2}+2acfgx+acg^{2}x^{2}+adf^{2}x+2adfgx^{2}+adg^{2}x^{3}+bcf^{2}x+2bcfgx^{2}+bcg^{2}x^{3}+bdf^{2}x^{2}+2bdfgx^{3}+b}{ABad-ABbc+\left(B^{2}ad-B^{2}bc\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (a*c*f**2 + 2*a*c*f*g*x + a*c*g**2*x**2 + a*d*f**2*x + 2*a*d*f*g*x**2 + a*d
*g**2*x**3 + b*c*f**2*x + 2*b*c*f*g*x**2 + b*c*g**2*x**3 + b*d*f**2*x**2 +
2*b*d*f*g*x**3 + b*d*g**2*x**4)/(A*B*a*d - A*B*b*c + (B**2*a*d - B**2*b*c)*
log(e*(a + b*x)/(c + d*x))) - (Integral(a*d*f**2/(A + B*log(a*e/(c + d*x) +
 b*e*x/(c + d*x))), x) + Integral(b*c*f**2/(A + B*log(a*e/(c + d*x) + b*e*x
/(c + d*x))), x) + Integral(2*a*c*f*g/(A + B*log(a*e/(c + d*x) + b*e*x/(c +
 d*x))), x) + Integral(2*a*c*g**2*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d
*x))), x) + Integral(3*a*d*g**2*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c +
d*x))), x) + Integral(3*b*c*g**2*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c +
 d*x))), x) + Integral(2*b*d*f**2*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d
*x))), x) + Integral(4*b*d*g**2*x**3/(A + B*log(a*e/(c + d*x) + b*e*x/(c +
d*x))), x) + Integral(4*a*d*f*g*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x
))), x) + Integral(4*b*c*f*g*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x)))
, x) + Integral(6*b*d*f*g*x**2/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x)))
, x))/(B*(a*d - b*c))
```

3.257 $\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=30

$$\text{Int}\left(\frac{f+gx}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + g*Defer[Int][x
/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{f}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx\\ &= f\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+g\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

fricas [A] time = 1.00, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{gx+f}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x +
 a*e)/(d*x + c)) + A^2), x)
```

giac [**F(-1)**]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**]   time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int((g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdgx^{3}+acf+\left(adg+\left(df+cg\right)b\right)x^{2}+\left(bcf+\left(df+cg\right)a\right)x}{(bc-ad)B^{2}\log\left(bx+a\right)-(bc-ad)B^{2}\log\left(dx+c\right)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^{2}}+\int\frac{}{(bc-ad)B^{2}\,\mathrm{lo}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*g*x^3 + a*c*f + (a*d*g + (d*f + c*g)*b)*x^2 + (b*c*f + (d*f + c*g)*a)
*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a
*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate((3*b*d*g*x^2 + b*c*f +
 (d*f + c*g)*a + 2*(a*d*g + (d*f + c*g)*b)*x)/((b*c - a*d)*B^2*log(b*x + a)
 - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e
))*B^2), x)
```

mupad [**A**]   time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f+g\,x}{{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)/(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int((f + g*x)/(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{acf+acgx+adfx+adgx^{2}+bcfx+bcgx^{2}+bdfx^{2}+bdgx^{3}}{ABad-ABbc+\left(B^{2}ad-B^{2}bc\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}-\frac{\int\frac{acg}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+\int\frac{adf}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (a*c*f + a*c*g*x + a*d*f*x + a*d*g*x**2 + b*c*f*x + b*c*g*x**2 + b*d*f*x**2
 + b*d*g*x**3)/(A*B*a*d - A*B*b*c + (B**2*a*d - B**2*b*c)*log(e*(a + b*x)/(
c + d*x))) - (Integral(a*c*g/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))),
x) + Integral(a*d*f/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Inte
gral(b*c*f/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integral(2*a*
d*g*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integral(2*b*c*g*x
/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integral(2*b*d*f*x/(A +
 B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x) + Integral(3*b*d*g*x**2/(A + B
*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x))/(B*(a*d - b*c))
```

3.258 $\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{1}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2),x]
```

```
[Out] Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x]
```

Rubi steps

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.59, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d
*x + c)) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^(-2), x)
```

maple [**A**]   time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdx^2+ac+(bc+ad)x}{(bc-ad)B^2\log(bx+a)-(bc-ad)B^2\log(dx+c)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^2}+\int\frac{}{(bc-ad)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d
)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + int
egrate((2*b*d*x + b*c + a*d)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^
2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2), x)
```

mupad [**A**]   time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)}{c+d\,x}\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A + B*log((e*(a + b*x))/(c + d*x)))^2,x)
```

```
[Out] int(1/(A + B*log((e*(a + b*x))/(c + d*x)))^2, x)
```

sympy [**A**]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{ac+adx+bcx+bdx^2}{ABad-ABbc+\left(B^2ad-B^2bc\right)\log\left(\frac{e(a+bx)}{c+dx}\right)}-\frac{\int\frac{ad}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+\int\frac{bc}{A+B\log\left(\frac{ae}{c+dx}+\frac{bex}{c+dx}\right)}\,dx+\int\frac{2bdx}{A+B\log\left(\frac{ae}{c+dx}\right.}}{B\,(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] (a*c + a*d*x + b*c*x + b*d*x**2)/(A*B*a*d - A*B*b*c + (B**2*a*d - B**2*b*c)
*log(e*(a + b*x)/(c + d*x))) - (Integral(a*d/(A + B*log(a*e/(c + d*x) + b*e
*x/(c + d*x))), x) + Integral(b*c/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x
))), x) + Integral(2*b*d*x/(A + B*log(a*e/(c + d*x) + b*e*x/(c + d*x))), x)
)/(B*(a*d - b*c))
```

3.259 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\mathrm{Int}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 2.60, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

fricas [A] time = 0.82, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{A^2gx+A^2f+\left(B^2gx+B^2f\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left(ABgx+ABf\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b*e*x + a*e)/(d*x + c)
)^2 + 2*(A*B*g*x + A*B*f)*log((b*e*x + a*e)/(d*x + c))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

maple [A] time = 1.37, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(g*x+f)/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdx^{2}+ac+\left(bc+ad\right.}{\left(bcf-adf\right)AB+\left(bcf\log(e)-adf\log(e)\right)B^{2}+\left(\left(bcg-adg\right)AB+\left(bcg\log(e)-adg\log(e)\right)B^{2}\right)x+\left(\left(bcg-\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f - a*d*f)*A*B + (b*c*f*log(e) - a*d
*f*log(e))*B^2 + ((b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2)*
x + ((b*c*g - a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(b*x + a) - ((b*c*g -
a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(d*x + c)) + integrate((b*d*g*x^2 +
2*b*d*f*x + b*c*f + (d*f - c*g)*a)/((b*c*f^2 - a*d*f^2)*A*B + (b*c*f^2*log(
e) - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*log(e) - a*d
*g^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*log(e) - a*d*
f*g*log(e))*B^2)*x + ((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B
^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - ((b*c*g^2 - a*d*g^2)*B^2*x^2
 + 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(d*x + c)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2),x)
```

```
[Out] int(1/((f + g*x)*(A + B*log((e*(a + b*x))/(c + d*x)))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.260 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 3.93, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

fricas [A] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2g^2x^2+2\,A^2fgx+A^2f^2+\left(B^2g^2x^2+2\,B^2fgx+B^2f^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left(ABg^2x^2+2\,ABfgx+AB\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*
x + B^2*f^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x
+ A*B*f^2)*log((b*e*x + a*e)/(d*x + c))), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

maple [**A**] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(g*x+f)^2/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(bcf^{2}-adf^{2}\right)AB+\left(bcf^{2}\log(e)-adf^{2}\log(e)\right)B^{2}+\left(\left(bcg^{2}-adg^{2}\right)AB+\left(bcg^{2}\log(e)-adg^{2}\log(e)\right)B^{2}\right)x^{2}+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f^2 - a*d*f^2)*A*B + (b*c*f^2*log(e)
 - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*log(e) - a*d*g
^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*log(e) - a*d*f*
g*log(e))*B^2)*x + ((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B^2
*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - ((b*c*g^2 - a*d*g^2)*B^2*x^2 +
 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(d*x + c)) - int
egrate(-(b*c*f + (d*f - 2*c*g)*a - (a*d*g - (2*d*f - c*g)*b)*x)/(((b*c*g^3
- a*d*g^3)*A*B + (b*c*g^3*log(e) - a*d*g^3*log(e))*B^2)*x^3 + (b*c*f^3 - a*
d*f^3)*A*B + (b*c*f^3*log(e) - a*d*f^3*log(e))*B^2 + 3*((b*c*f*g^2 - a*d*f*
g^2)*A*B + (b*c*f*g^2*log(e) - a*d*f*g^2*log(e))*B^2)*x^2 + 3*((b*c*f^2*g -
 a*d*f^2*g)*A*B + (b*c*f^2*g*log(e) - a*d*f^2*g*log(e))*B^2)*x + ((b*c*g^3
- a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d
*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(b*x + a) - ((b*c*g^3 - a*d*g^3
)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B
^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(d*x + c)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2),x)
```

```
[Out] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x))/(c + d*x)))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.261 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 30.01, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

fricas [A] time = 0.89, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2g^3x^3+3\,A^2fg^2x^2+3\,A^2f^2gx+A^2f^3+\left(B^2g^3x^3+3\,B^2fg^2x^2+3\,B^2f^2gx+B^2f^3\right)\log\left(\frac{bex+ae}{dx+c}\right)^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*
g^3*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b*e*x + a*e)/(d*x
 + c))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*log(
(b*e*x + a*e)/(d*x + c))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

maple [A] time = 1.80, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\ln\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

```
[Out] int(1/(g*x+f)^3/(B*ln((b*x+a)/(d*x+c)*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{\left(\left(bcg^{3}-adg^{3}\right)AB+\left(bcg^{3}\log(e)-adg^{3}\log(e)\right)B^{2}\right)x^{3}+\left(bcf^{3}-adf^{3}\right)AB+\left(bcf^{3}\log(e)-adf^{3}\log(e)\right)B^{2}+3\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/(((b*c*g^3 - a*d*g^3)*A*B + (b*c*g^3*log(e
) - a*d*g^3*log(e))*B^2)*x^3 + (b*c*f^3 - a*d*f^3)*A*B + (b*c*f^3*log(e) -
a*d*f^3*log(e))*B^2 + 3*((b*c*f*g^2 - a*d*f*g^2)*A*B + (b*c*f*g^2*log(e) -
a*d*f*g^2*log(e))*B^2)*x^2 + 3*((b*c*f^2*g - a*d*f^2*g)*A*B + (b*c*f^2*g*lo
g(e) - a*d*f^2*g*log(e))*B^2)*x + ((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g
^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*
f^3)*B^2)*log(b*x + a) - ((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*
f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)
*log(d*x + c)) - integrate((b*d*g*x^2 - b*c*f - (d*f - 3*c*g)*a + 2*(a*d*g
- (d*f - c*g)*b)*x)/(((b*c*g^4 - a*d*g^4)*A*B + (b*c*g^4*log(e) - a*d*g^4*l
og(e))*B^2)*x^4 + 4*((b*c*f*g^3 - a*d*f*g^3)*A*B + (b*c*f*g^3*log(e) - a*d*
f*g^3*log(e))*B^2)*x^3 + (b*c*f^4 - a*d*f^4)*A*B + (b*c*f^4*log(e) - a*d*f^
4*log(e))*B^2 + 6*((b*c*f^2*g^2 - a*d*f^2*g^2)*A*B + (b*c*f^2*g^2*log(e) -
a*d*f^2*g^2*log(e))*B^2)*x^2 + 4*((b*c*f^3*g - a*d*f^3*g)*A*B + (b*c*f^3*g*
log(e) - a*d*f^3*g*log(e))*B^2)*x + ((b*c*g^4 - a*d*g^4)*B^2*x^4 + 4*(b*c*f
*g^3 - a*d*f*g^3)*B^2*x^3 + 6*(b*c*f^2*g^2 - a*d*f^2*g^2)*B^2*x^2 + 4*(b*c*
f^3*g - a*d*f^3*g)*B^2*x + (b*c*f^4 - a*d*f^4)*B^2)*log(b*x + a) - ((b*c*g^
4 - a*d*g^4)*B^2*x^4 + 4*(b*c*f*g^3 - a*d*f*g^3)*B^2*x^3 + 6*(b*c*f^2*g^2 -
 a*d*f^2*g^2)*B^2*x^2 + 4*(b*c*f^3*g - a*d*f^3*g)*B^2*x + (b*c*f^4 - a*d*f^
4)*B^2)*log(d*x + c)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^3\,{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)}{c+d\,x}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2),x)
```

```
[Out] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x))/(c + d*x)))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

3.262 $\int (f+gx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=357

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{5b^3d^3}+\frac{2Bgx(bc-ad)(a^3d^3g^3-a^2bd^2g^2(5d}{}$$

```
[Out] 2/5*B*(-a*d+b*c)*g*(a^3*d^3*g^3-a^2*b*d^2*g^2*(-c*g+5*d*f)+a*b^2*d*g*(c^2*g
^2-5*c*d*f*g+10*d^2*f^2)-b^3*(-c^3*g^3+5*c^2*d*f*g^2-10*c*d^2*f^2*g+10*d^3*
f^3))*x/b^4/d^4-1/5*B*(-a*d+b*c)*g^2*(a^2*d^2*g^2-a*b*d*g*(-c*g+5*d*f)+b^2*
(c^2*g^2-5*c*d*f*g+10*d^2*f^2))*x^2/b^3/d^3-2/15*B*(-a*d+b*c)*g^3*(-a*d*g-b
*c*g+5*b*d*f)*x^3/b^2/d^2-1/10*B*(-a*d+b*c)*g^4*x^4/b/d-2/5*B*(-a*g+b*f)^5*
ln(b*x+a)/b^5/g+1/5*(g*x+f)^5*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/g+2/5*B*(-c*g
+d*f)^5*ln(d*x+c)/d^5/g
```

Rubi [A] time = 0.50, antiderivative size = 341, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2525, 12, 72}

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{5b^3d^3}+\frac{2Bgx(-10a^2b^2d^4f^2g+5a^3bd^4fg^2-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (2*B*g*(10*a*b^3*d^4*f^3 - 10*a^2*b^2*d^4*f^2*g + 5*a^3*b*d^4*f*g^2 - a^4*d
^4*g^3 - b^4*c*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*d*f*g^2 - c^3*g^3))*x)/
(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*d*g*(5*d*f - c*g) + b^2
*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*x^2)/(5*b^3*d^3) - (2*B*(b*c - a*d)*g^
3*(5*b*d*f - b*c*g - a*d*g)*x^3)/(15*b^2*d^2) - (B*(b*c - a*d)*g^4*x^4)/(10
*b*d) - (2*B*(b*f - a*g)^5*Log[a + b*x])/(5*b^5*g) + ((f + g*x)^5*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*g) + (2*B*(d*f - c*g)^5*Log[c + d*x])/(
5*d^5*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5g}-\frac{B\int\frac{2(bc-ad)(f+gx)^5}{(a+bx)(c+dx)}dx}{5g}$$

$$=\frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5g}-\frac{(2B(bc-ad))\int\frac{(f+gx)^5}{(a+bx)(c+dx)}dx}{5g}$$

$$=\frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5g}-\frac{(2B(bc-ad))\int\left(\frac{g^2\left(-a^3d^3g^3+a^2bd\right.}{}\right.}{}$$

$$=\frac{2B(bc-ad)g\left(a^3d^3g^3-a^2bd^2g^2(5df-cg)+ab^2dg\left(10d^2f^2-5cd\right.\right.}{5b^4d^4}$$

Mathematica [A] time = 0.60, size = 282, normalized size = 0.79

$$\frac{Bg^2x(ad-bc)\left(-12a^3d^3g^3+6a^2bd^2g^2(-2cg+10df+dgx)-2ab^2dg\left(6c^2g^2-3cdg(10f+gx)+d^2\left(60f^2+15fgx+2g^2x^2\right)\right)+b^3\left(-12c^3g^3+6c^2dg^2(10f+gx)-2c\right.\right.}{6b^4d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] ((B*(-(b*c) + a*d)*g^2*x*(-12*a^3*d^3*g^3 + 6*a^2*b*d^2*g^2*(10*d*f - 2*c*g
 + d*g*x) - 2*a*b^2*d*g*(6*c^2*g^2 - 3*c*d*g*(10*f + g*x) + d^2*(60*f^2 + 1
5*f*g*x + 2*g^2*x^2)) + b^3*(-12*c^3*g^3 + 6*c^2*d*g^2*(10*f + g*x) - 2*c*d
^2*g*(60*f^2 + 15*f*g*x + 2*g^2*x^2) + d^3*(120*f^3 + 60*f^2*g*x + 20*f*g^2
*x^2 + 3*g^3*x^3))))/(6*b^4*d^4) - (2*B*(b*f - a*g)^5*Log[a + b*x])/b^5 + (
f + g*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (2*B*(d*f - c*g)^5*Lo
g[c + d*x])/d^5)/(5*g)
```

fricas [A] time = 2.35, size = 660, normalized size = 1.85

$$\frac{6\,Ab^5d^5g^4x^5+3\left(10\,Ab^5d^5fg^3-\left(Bb^5cd^4-Bab^4d^5\right)g^4\right)x^4+4\left(15\,Ab^5d^5f^2g^2-5\left(Bb^5cd^4-Bab^4d^5\right)fg^3+\left(Bb\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/30*(6*A*b^5*d^5*g^4*x^5 + 3*(10*A*b^5*d^5*f*g^3 - (B*b^5*c*d^4 - B*a*b^4*
d^5)*g^4)*x^4 + 4*(15*A*b^5*d^5*f^2*g^2 - 5*(B*b^5*c*d^4 - B*a*b^4*d^5)*f*g
^3 + (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*g^4)*x^3 + 6*(10*A*b^5*d^5*f^3*g - 10*
(B*b^5*c*d^4 - B*a*b^4*d^5)*f^2*g^2 + 5*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f*g
^3 - (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g^4)*x^2 + 6*(5*A*b^5*d^5*f^4 - 20*(B*
b^5*c*d^4 - B*a*b^4*d^5)*f^3*g + 20*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f^2*g^2
 - 10*(B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*f*g^3 + 2*(B*b^5*c^4*d - B*a^4*b*d^5)
*g^4)*x + 12*(5*B*a*b^4*d^5*f^4 - 10*B*a^2*b^3*d^5*f^3*g + 10*B*a^3*b^2*d^5
*f^2*g^2 - 5*B*a^4*b*d^5*f*g^3 + B*a^5*d^5*g^4)*log(b*x + a) - 12*(5*B*b^5*
c*d^4*f^4 - 10*B*b^5*c^2*d^3*f^3*g + 10*B*b^5*c^3*d^2*f^2*g^2 - 5*B*b^5*c^4
*d*f*g^3 + B*b^5*c^5*g^4)*log(d*x + c) + 6*(B*b^5*d^5*g^4*x^5 + 5*B*b^5*d^5
*f*g^3*x^4 + 10*B*b^5*d^5*f^2*g^2*x^3 + 10*B*b^5*d^5*f^3*g*x^2 + 5*B*b^5*d^
5*f^4*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b
^5*d^5)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.15, size = 2438, normalized size = 6.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^4*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] A*x*f^4+1/5*A*x^5*g^4-8*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2
*c*f^3*g-12/d^2*B/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^2*f^2*g^2+16/d^3*
B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^4*f*g^3+2/d^3*B/b/(a*d-b*
c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c^4*g^4-8/d^2*B/(a*d-b*c)*ln(1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*b*f^3*g+12/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1
/(d*x+c)*b*c+b)*c^4*b*f^2*g^2+8/d^3*B*g^3*a/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*
c+b)*c^3*f+8/d*B*g/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c*f^3-24/d^2*B/(a*
d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^3*f^2*g^2+16/d*B/(a*d-b*c)*ln(
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^2*f^3*g-8/d^4*B/(a*d-b*c)*ln(1/(d*x+c)*a
*d-1/(d*x+c)*b*c+b)*c^5*b*f*g^3+5/6/d^5*B*g^4*c^5+B*ln((1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)^2/d^2*e)*x*f^4+1/5*B*g^4*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d
^2*e)*x^5+1/d*A*c*f^4+1/5/d^5*A*c^5*g^4+A*x^4*f*g^3+2*A*x^2*f^3*g+2*A*x^3*f
^2*g^2-8/d^2*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c^3*f*g^3+
12/d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c^2*f^2*g^2-2/d^2*
B/b*a*c^2*f^2*g^2+2/3/d^3*B*g^3*a/b*c^3*f+1/d^2*B*g^3*a^2/b^2*c^2*f+4/d*B*g
/b*a*f^3*c+2/d*B*g^3*a^3/b^3*f*c-4/d*B*g^2*a^2/b^2*f^2*c+4*B*g/b^2*ln(1/(d*
x+c))*a^2*f^3+2*B*g^3*a^4/b^4*ln(1/(d*x+c))*f-2*B*g^3*a^4/b^4*ln(1/(d*x+c)*
a*d-1/(d*x+c)*b*c+b)*f+2/3*B*g^3*a/b*f*x^3-1/10/d*B*g^4*c*x^4-2/5*B*g^4*a^4
/b^4*x+1/10*B*g^4*a/b*x^4+1/5*B*g^4*a^3/b^3*x^2-2/15*B*g^4*a^2/b^2*x^3-4/d^
4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^5*g^4+2/d*B/(a*d-b*c)*l
n(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2*b*f^4+2*d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a
*d-1/(d*x+c)*b*c+b)*a^2*f^4-2/d^4*B*g^4*a/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+
b)*c^4+2/d^5*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^6*b*g^4+2/5/d^
5*B*ln(1/(d*x+c))*c^5*g^4+8/5/d^5*B*g^4*c^5*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+
b)+2*B*g*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f^3*x^2+B*g^3*ln((1/(d
*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f*x^4+2*B*g^2*ln((1/(d*x+c)*a*d-1/(d*x+
c)*b*c+b)^2/d^2*e)*f^2*x^3-2/5*B*g^4*a^5/b^5*ln(1/(d*x+c))+2/5*B*g^4*a^5/b^
5*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-2*B/b*ln(1/(d*x+c))*a*f^4+2/15/d^2*B*g^
4*c^2*x^3-1/5/d^3*B*g^4*c^3*x^2+2/5/d^4*B*g^4*c^4*x+1/d*B*ln((1/(d*x+c)*a*d
-1/(d*x+c)*b*c+b)^2/d^2*e)*c*f^4+2/d*B*ln(1/(d*x+c))*c*f^4+1/5/d^5*B*g^4*ln
((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c^5-11/3/d^4*B*g^3*c^4*f+6/d^3*B*
c^3*f^2*g^2-4/d^2*B*c^2*f^3*g-1/d^4*A*c^4*f*g^3+2/d^3*A*c^3*f^2*g^2-2/d^2*A
*c^2*f^3*g-1/10/d^4*B*g^4*a/b*c^4-1/5/d^2*B*g^4*a^3/b^3*c^2-2/15/d^3*B*g^4*
a^2/b^2*c^3-2/5/d*B*g^4*a^4/b^4*c-4/d*B*g*c*f^3*x-4*B*g^2*a^3/b^3*ln(1/(d*x
+c))*f^2-4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c*f^4+4*B*g^2*a^
3/b^3*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*f^2-4*B*g/b^2*ln(1/(d*x+c)*a*d-1/(d
*x+c)*b*c+b)*a^2*f^3+4/d^3*B*ln(1/(d*x+c))*c^3*f^2*g^2-4/d^2*B*ln(1/(d*x+c)
)*c^2*f^3*g-6/d^4*B*g^3*c^4*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*f+8/d^3*B*ln(
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*f^2*g^2-4/d^2*B*g*ln(1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)*c^2*f^3-1/d^4*B*g^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)
*c^4*f+2/d^3*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c^3*f^2*g^2-2/d^
2*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c^2*f^3*g+4*B*g/b*a*f^3*x+2
*B*g^3*a^3/b^3*f*x-4*B*g^2*a^2/b^2*f^2*x+2*B*g^2*a/b*f^2*x^2-2/d^4*B*ln(1/(
d*x+c))*c^4*f*g^3-B*g^3*a^2/b^2*f*x^2+4/d^2*B*c^2*f^2*g^2*x+1/d^2*B*g^3*c^2
*f*x^2-2/d^3*B*g^3*c^3*f*x-2/3/d*B*g^3*c*f*x^3-2/d*B*g^2*c*f^2*x^2
```

maxima [**B**] time = 1.17, size = 855, normalized size = 2.39

$$\frac{1}{5}Ag^4x^5+Afg^3x^4+2Af^2g^2x^3+2Af^3gx^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2cdx+c^2}+\frac{2abex}{d^2x^2+2cdx+c^2}+\frac{a^2e}{d^2x^2+2cdx+c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/5*A*g^4*x^5 + A*f*g^3*x^4 + 2*A*f^2*g^2*x^3 + 2*A*f^3*g*x^2 + (x*log(b^2*
e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2
*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*
f^4 + 2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 +
 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2
 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*f^3*g + 2*(x^3*log(b^2
*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^
2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f^
2*g^2 + 1/3*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2
*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x +
a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c
^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*f*g^3 + 1/30*
(6*x^5*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d
*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 12*a^5*log(b*x + a)/b^5 - 12
*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a
^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)
/(b^4*d^4))*B*g^4 + A*f^4*x
```

mupad [**B**] time = 5.33, size = 1403, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^4*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] log((e*(a + b*x)^2)/(c + d*x)^2)*((B*g^4*x^5)/5 + B*f^4*x + 2*B*f^2*g^2*x^3
 + 2*B*f^3*g*x^2 + B*f*g^3*x^4) + x^2*((20*A*a*c*f*g^3 + 20*A*b*d*f^3*g + 3
0*A*a*d*f^2*g^2 + 30*A*b*c*f^2*g^2 + 20*B*a*d*f^2*g^2 - 20*B*b*c*f^2*g^2)/(
10*b*d) + ((5*a*d + 5*b*c)*((((5*A*a*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*
B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a
*d + 5*b*c))/(5*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 10*
B*a*d*f*g^3 - 10*B*b*c*f*g^3 + 30*A*b*d*f^2*g^2)/(5*b*d) + (A*a*c*g^4)/(b*d
)))/(10*b*d) - (a*c*((5*A*a*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*B*b*c*g^4
 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d)))/(2*b*d)) + x
^4*((5*A*a*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*B*b*c*g^4 + 20*A*b*d*f*g^3
)/(20*b*d) - (A*g^4*(5*a*d + 5*b*c))/(20*b*d)) + x*((5*A*b*d*f^4 + 20*A*a*d
*f^3*g + 20*A*b*c*f^3*g + 20*B*a*d*f^3*g - 20*B*b*c*f^3*g + 30*A*a*c*f^2*g^
2)/(5*b*d) - ((5*a*d + 5*b*c)*((20*A*a*c*f*g^3 + 20*A*b*d*f^3*g + 30*A*a*d*
f^2*g^2 + 30*A*b*c*f^2*g^2 + 20*B*a*d*f^2*g^2 - 20*B*b*c*f^2*g^2)/(5*b*d) +
 ((5*a*d + 5*b*c)*((((5*A*a*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*B*b*c*g^4
 + 20*A*b*d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*
c))/(5*b*d) - (5*A*a*c*g^4 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 10*B*a*d*f*g
^3 - 10*B*b*c*f*g^3 + 30*A*b*d*f^2*g^2)/(5*b*d) + (A*a*c*g^4)/(b*d)))/(5*b*
d) - (a*c*((5*A*a*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*B*b*c*g^4 + 20*A*b*
d*f*g^3)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d)))/(b*d)))/(5*b*d) + (a*c
*((((5*A*a*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*B*b*c*g^4 + 20*A*b*d*f*g^3
)/(5*b*d) - (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*
A*a*c*g^4 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 10*B*a*d*f*g^3 - 10*B*b*c*f*g
^3 + 30*A*b*d*f^2*g^2)/(5*b*d) + (A*a*c*g^4)/(b*d)))/(b*d)) - x^3*((((5*A*a
```

```
*d*g^4 + 5*A*b*c*g^4 + 2*B*a*d*g^4 - 2*B*b*c*g^4 + 20*A*b*d*f*g^3)/(5*b*d)
- (A*g^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(15*b*d) - (5*A*a*c*g^4
 + 20*A*a*d*f*g^3 + 20*A*b*c*f*g^3 + 10*B*a*d*f*g^3 - 10*B*b*c*f*g^3 + 30*A
*b*d*f^2*g^2)/(15*b*d) + (A*a*c*g^4)/(3*b*d)) + (A*g^4*x^5)/5 + (log(a + b*
x)*((2*B*a^5*g^4)/5 + 2*B*a*b^4*f^4 - 4*B*a^2*b^3*f^3*g + 4*B*a^3*b^2*f^2*g
^2 - 2*B*a^4*b*f*g^3))/b^5 - (log(c + d*x)*(2*B*c^5*g^4 + 10*B*c*d^4*f^4 -
20*B*c^2*d^3*f^3*g + 20*B*c^3*d^2*f^2*g^2 - 10*B*c^4*d*f*g^3))/(5*d^5)
```

sympy [**B**] time = 26.59, size = 1477, normalized size = 4.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**4*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g**4*x**5/5 + 2*B*a*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g**2
 - 10*a*b**3*f**3*g + 5*b**4*f**4)*log(x + (2*B*a**5*c*d**4*g**4 - 10*B*a**
4*b*c*d**4*f*g**3 + 20*B*a**3*b**2*c*d**4*f**2*g**2 - 20*B*a**2*b**3*c*d**4
*f**3*g + 2*B*a**2*d**5*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g*
*2 - 10*a*b**3*f**3*g + 5*b**4*f**4)/b + 2*B*a*b**4*c**5*g**4 - 10*B*a*b**4
*c**4*d*f*g**3 + 20*B*a*b**4*c**3*d**2*f**2*g**2 - 20*B*a*b**4*c**2*d**3*f*
*3*g + 20*B*a*b**4*c*d**4*f**4 - 2*B*a*c*d**4*(a**4*g**4 - 5*a**3*b*f*g**3
+ 10*a**2*b**2*f**2*g**2 - 10*a*b**3*f**3*g + 5*b**4*f**4))/(2*B*a**5*d**5*
g**4 - 10*B*a**4*b*d**5*f*g**3 + 20*B*a**3*b**2*d**5*f**2*g**2 - 20*B*a**2*
b**3*d**5*f**3*g + 10*B*a*b**4*d**5*f**4 + 2*B*b**5*c**5*g**4 - 10*B*b**5*c
**4*d*f*g**3 + 20*B*b**5*c**3*d**2*f**2*g**2 - 20*B*b**5*c**2*d**3*f**3*g +
 10*B*b**5*c*d**4*f**4))/(5*b**5) - 2*B*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10
*c**2*d**2*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4)*log(x + (2*B*a**5*c*
d**4*g**4 - 10*B*a**4*b*c*d**4*f*g**3 + 20*B*a**3*b**2*c*d**4*f**2*g**2 - 2
0*B*a**2*b**3*c*d**4*f**3*g + 2*B*a*b**4*c**5*g**4 - 10*B*a*b**4*c**4*d*f*g
**3 + 20*B*a*b**4*c**3*d**2*f**2*g**2 - 20*B*a*b**4*c**2*d**3*f**3*g + 20*B
*a*b**4*c*d**4*f**4 - 2*B*a*b**4*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d
**2*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4) + 2*B*b**5*c**2*(c**4*g**4
- 5*c**3*d*f*g**3 + 10*c**2*d**2*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4
)/d)/(2*B*a**5*d**5*g**4 - 10*B*a**4*b*d**5*f*g**3 + 20*B*a**3*b**2*d**5*f*
*2*g**2 - 20*B*a**2*b**3*d**5*f**3*g + 10*B*a*b**4*d**5*f**4 + 2*B*b**5*c**
5*g**4 - 10*B*b**5*c**4*d*f*g**3 + 20*B*b**5*c**3*d**2*f**2*g**2 - 20*B*b**
5*c**2*d**3*f**3*g + 10*B*b**5*c*d**4*f**4))/(5*d**5) + x**4*(A*f*g**3 + B*
a*g**4/(10*b) - B*c*g**4/(10*d)) + x**3*(2*A*f**2*g**2 - 2*B*a**2*g**4/(15*
b**2) + 2*B*a*f*g**3/(3*b) + 2*B*c**2*g**4/(15*d**2) - 2*B*c*f*g**3/(3*d))
+ x**2*(2*A*f**3*g + B*a**3*g**4/(5*b**3) - B*a**2*f*g**3/b**2 + 2*B*a*f**2
*g**2/b - B*c**3*g**4/(5*d**3) + B*c**2*f*g**3/d**2 - 2*B*c*f**2*g**2/d) +
x*(A*f**4 - 2*B*a**4*g**4/(5*b**4) + 2*B*a**3*f*g**3/b**3 - 4*B*a**2*f**2*g
**2/b**2 + 4*B*a*f**3*g/b + 2*B*c**4*g**4/(5*d**4) - 2*B*c**3*f*g**3/d**3 +
 4*B*c**2*f**2*g**2/d**2 - 4*B*c*f**3*g/d) + (B*f**4*x + 2*B*f**3*g*x**2 +
2*B*f**2*g**2*x**3 + B*f*g**3*x**4 + B*g**4*x**5/5)*log(e*(a + b*x)**2/(c +
 d*x)**2)
```

3.263 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=229

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{2b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4g}-$$

```
[Out] -1/2*B*(-a*d+b*c)*g*(a^2*d^2*g^2-a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*
g+6*d^2*f^2))*x/b^3/d^3-1/4*B*(-a*d+b*c)*g^2*(-a*d*g-b*c*g+4*b*d*f)*x^2/b^2
/d^2-1/6*B*(-a*d+b*c)*g^3*x^3/b/d-1/2*B*(-a*g+b*f)^4*ln(b*x+a)/b^4/g+1/4*(g
*x+f)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/g+1/2*B*(-c*g+d*f)^4*ln(d*x+c)/d^4/
g
```

Rubi [A] time = 0.32, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2525, 12, 72}

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{2b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4g}-$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*x)/(2*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g -
 a*d*g)*x^2)/(4*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3)/(6*b*d) - (B*(b*f - a*g)
^4*Log[a + b*x])/(2*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(4*g) + (B*(d*f - c*g)^4*Log[c + d*x])/(2*d^4*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx = \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4g} - \frac{B\int \frac{2(bc-ad)(f+gx)^4}{(a+bx)(c+dx)}dx}{4g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4g} - \frac{(B(bc-ad))\int \frac{(f+gx)^4}{(a+bx)(c+dx)}dx}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4g} - \frac{(B(bc-ad))\int \left(\frac{g^2\left(a^2d^2g^2-abdg(4df-c\right.}{}\right.}{}$$

$$= -\frac{B(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right.}{2b^3d^3}$$

Mathematica [A] time = 0.26, size = 217, normalized size = 0.95

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-\frac{B\left(6bdg^2x(bc-ad)\left(a^2d^2g^2+abdg(cg-4df)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)+2b^3d^3g^4x^3(bc-ad)+3b^2d^2g^3x^2(bc-a\right.}{3b^4d^4}}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - (B*(6*b*d*(b*c - a*
d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g +
 c^2*g^2))*x + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2 + 2*
b^3*d^3*(b*c - a*d)*g^4*x^3 + 6*d^4*(b*f - a*g)^4*Log[a + b*x] - 6*b^4*(d*f
 - c*g)^4*Log[c + d*x]))/(3*b^4*d^4))/(4*g)
```

fricas [B] time = 1.31, size = 468, normalized size = 2.04

$$\frac{3\,Ab^4d^4g^3x^4+2\left(6\,Ab^4d^4fg^2-\left(Bb^4cd^3-Bab^3d^4\right)g^3\right)x^3+3\left(6\,Ab^4d^4f^2g-4\left(Bb^4cd^3-Bab^3d^4\right)fg^2+\left(Bb^4c^2d^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/12*(3*A*b^4*d^4*g^3*x^4 + 2*(6*A*b^4*d^4*f*g^2 - (B*b^4*c*d^3 - B*a*b^3*d
^4)*g^3)*x^3 + 3*(6*A*b^4*d^4*f^2*g - 4*(B*b^4*c*d^3 - B*a*b^3*d^4)*f*g^2 +
 (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g^3)*x^2 + 6*(2*A*b^4*d^4*f^3 - 6*(B*b^4*c
*d^3 - B*a*b^3*d^4)*f^2*g + 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*f*g^2 - (B*b^
4*c^3*d - B*a^3*b*d^4)*g^3)*x + 6*(4*B*a*b^3*d^4*f^3 - 6*B*a^2*b^2*d^4*f^2*
g + 4*B*a^3*b*d^4*f*g^2 - B*a^4*d^4*g^3)*log(b*x + a) - 6*(4*B*b^4*c*d^3*f^
3 - 6*B*b^4*c^2*d^2*f^2*g + 4*B*b^4*c^3*d*f*g^2 - B*b^4*c^4*g^3)*log(d*x +
c) + 3*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*d^4*f*g^2*x^3 + 6*B*b^4*d^4*f^2*g*x^2 +
 4*B*b^4*d^4*f^3*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
+ c^2)))/(b^4*d^4)
```

giac [B] time = 167.45, size = 447, normalized size = 1.95

$$\frac{1}{4}\left(Ag^3+Bg^3\right)x^4+\frac{\left(6\,Abdfg^2+6\,Bbdfg^2-Bbcg^3+Badg^3\right)x^3}{6\,bd}+\frac{1}{4}\left(Bg^3x^4+4\,Bfg^2x^3+6\,Bf^2gx^2+4\,Bf^3x\right)\log\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] 1/4*(A*g^3 + B*g^3)*x^4 + 1/6*(6*A*b*d*f*g^2 + 6*B*b*d*f*g^2 - B*b*c*g^3 +
B*a*d*g^3)*x^3/(b*d) + 1/4*(B*g^3*x^4 + 4*B*f*g^2*x^3 + 6*B*f^2*g*x^2 + 4*B
*f^3*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) + 1/4*(6*A
*b^2*d^2*f^2*g + 6*B*b^2*d^2*f^2*g - 4*B*b^2*c*d*f*g^2 + 4*B*a*b*d^2*f*g^2
+ B*b^2*c^2*g^3 - B*a^2*d^2*g^3)*x^2/(b^2*d^2) + 1/2*(4*B*a*b^3*f^3 - 6*B*a
^2*b^2*f^2*g + 4*B*a^3*b*f*g^2 - B*a^4*g^3)*log(b*x + a)/b^4 - 1/2*(4*B*c*d
^3*f^3 - 6*B*c^2*d^2*f^2*g + 4*B*c^3*d*f*g^2 - B*c^4*g^3)*log(-d*x - c)/d^4
 + 1/2*(2*A*b^3*d^3*f^3 + 2*B*b^3*d^3*f^3 - 6*B*b^3*c*d^2*f^2*g + 6*B*a*b^2
*d^3*f^2*g + 4*B*b^3*c^2*d*f*g^2 - 4*B*a^2*b*d^3*f*g^2 - B*b^3*c^3*g^3 + B*
a^3*d^3*g^3)*x/(b^3*d^3)
```

maple [B] time = 0.09, size = 1783, normalized size = 7.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] -3/2/d^2*A*c^2*f^2*g-3/d^2*B*c^2*f^2*g+1/d^3*A*c^3*f*g^2+3/d^3*B*c^3*f*g^2-
1/2/d^3*B*c^3*g^3*x+1/4/d^2*B*c^2*g^3*x^2+B*g^2*ln((1/(d*x+c)*a*d-1/(d*x+c)
*b*c+b)^2/d^2*e)*f*x^3+3/2*B*g*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*
f^2*x^2-2*B/b*ln(1/(d*x+c))*a*f^3+2/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c
)*b*c+b)*c^2*b*f^3+2/d^3*B*g^3*a/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3+2*
d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*f^3-11/12/d^4*B*g^3*c
^4-1/4/d^4*A*c^4*g^3+1/d*A*c*f^3+A*x^3*f*g^2+3/2*A*x^2*f^2*g+1/4*B*g^3*ln((
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x^4+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^2/d^2*e)*x*f^3-2/d^2*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*
a^2*c^3*g^3+6/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^4*b*f*g^2
-12/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^3*f*g^2-6/d^2*B/(
a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*b*f^2*g-6/d^2*B/b*ln(1/(d*x+
c)*a*d-1/(d*x+c)*b*c+b)*a*c^2*f*g^2+6/d*B*g/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*
c+b)*a*c*f^2+12/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^2*f^2*g
-6*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c*f^2*g+1/4*A*x^4*g^
3+A*x*f^3+6/d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*c^2*f*g^2
+1/2/d*B*g^3*a^3/b^3*c+1/4/d^2*B*g^3*a^2/b^2*c^2+1/6/d^3*B*g^3*a/b*c^3+1/d^
3*B*g^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f*c^3-3/d^2*B*g*ln(1/(d
*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2*f^2-3/2/d^2*B*g*ln((1/(d*x+c)*a*d-1/(d*x+c)*
b*c+b)^2/d^2*e)*f^2*c^2+4/d^3*B*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*f*g^2
-1/2/d^4*B*ln(1/(d*x+c))*c^4*g^3-1/4/d^4*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+
b)^2/d^2*e)*c^4*g^3+1/d*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c*f^3
+2/d*B*ln(1/(d*x+c))*c*f^3-3/2/d^4*B*g^3*c^4*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c
+b)-1/2*B*g^3*a^4/b^4*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)+1/2*B*g^3*a^4/b^4*l
n(1/(d*x+c))+1/6*B*g^3*a/b*x^3-1/4*B*g^3*a^2/b^2*x^2+1/2*B*g^3*a^3/b^3*x-1/
6/d*B*g^3*c*x^3+2*B*g^2*a^3/b^3*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*f-2*B*g^2
*a^3/b^3*ln(1/(d*x+c))*f+3*B*g/b*a*f^2*x-2*B*g^2*a^2/b^2*f*x+2/d^2*B*c^2*f*
g^2*x-1/d*B*g^2*c*f*x^2-3/d*B*g*c*f^2*x+2/d^3*B*ln(1/(d*x+c))*c^3*f*g^2-3*B
*g/b^2*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*f^2+3*B*g/b^2*ln(1/(d*x+c))*a^
2*f^2+B*g^2*a/b*f*x^2-3/d^2*B*ln(1/(d*x+c))*c^2*f^2*g-4*B/(a*d-b*c)*ln(1/(d
*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c*f^3+4/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)*a*c^4*g^3-2/d^4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c
^5*b*g^3+3/d*B*g/b*a*f^2*c-1/d^2*B/b*a*c^2*f*g^2-2/d*B*g^2*a^2/b^2*f*c
```

maxima [B] time = 1.06, size = 623, normalized size = 2.72

$$\frac{1}{4}\,Ag^3x^4+Afg^2x^3+\frac{3}{2}\,Af^2gx^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/4*A*g^3*x^4 + A*f*g^2*x^3 + 3/2*A*f^2*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 +
 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*
c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*f^3 + 3/2*(x^2*l
og(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2
) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d
*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*f^2*g + (x^3*log(b^2*e*x^2/(d^2*x^2
+ 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2
*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f*g^2 + 1/12*(3*x^
4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x +
c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*lo
g(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*g^3 + A*f^3*x
```

mupad [B] time = 5.03, size = 743, normalized size = 3.24

$$\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\left(B\,f^3\,x+\frac{3\,B\,f^2\,g\,x^2}{2}+B\,f\,g^2\,x^3+\frac{B\,g^3\,x^4}{4}\right)+x\left(\frac{2\,A\,b\,d\,f^3+6\,A\,a\,c\,f\,g^2+6\,A\,a\,d\,f^2\,g+6\,A\,b\,c}{2\,b\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] log((e*(a + b*x)^2)/(c + d*x)^2)*((B*g^3*x^4)/4 + B*f^3*x + (3*B*f^2*g*x^2)
/2 + B*f*g^2*x^3) + x*((2*A*b*d*f^3 + 6*A*a*c*f*g^2 + 6*A*a*d*f^2*g + 6*A*b
*c*f^2*g + 6*B*a*d*f^2*g - 6*B*b*c*f^2*g)/(2*b*d) + ((2*a*d + 2*b*c)*((((2*
A*a*d*g^3 + 2*A*b*c*g^3 + B*a*d*g^3 - B*b*c*g^3 + 6*A*b*d*f*g^2)/(2*b*d) -
(A*g^3*(2*a*d + 2*b*c))/(2*b*d))*(2*a*d + 2*b*c))/(2*b*d) - (2*A*a*c*g^3 +
6*A*a*d*f*g^2 + 6*A*b*c*f*g^2 + 6*A*b*d*f^2*g + 4*B*a*d*f*g^2 - 4*B*b*c*f*g
^2)/(2*b*d) + (A*a*c*g^3)/(b*d)))/(2*b*d) - (a*c*((2*A*a*d*g^3 + 2*A*b*c*g^
3 + B*a*d*g^3 - B*b*c*g^3 + 6*A*b*d*f*g^2)/(2*b*d) - (A*g^3*(2*a*d + 2*b*c)
)/(2*b*d)))/(b*d)) - x^2*((((2*A*a*d*g^3 + 2*A*b*c*g^3 + B*a*d*g^3 - B*b*c*
g^3 + 6*A*b*d*f*g^2)/(2*b*d) - (A*g^3*(2*a*d + 2*b*c))/(2*b*d))*(2*a*d + 2*
b*c))/(4*b*d) - (2*A*a*c*g^3 + 6*A*a*d*f*g^2 + 6*A*b*c*f*g^2 + 6*A*b*d*f^2*
g + 4*B*a*d*f*g^2 - 4*B*b*c*f*g^2)/(4*b*d) + (A*a*c*g^3)/(2*b*d)) + x^3*((2
*A*a*d*g^3 + 2*A*b*c*g^3 + B*a*d*g^3 - B*b*c*g^3 + 6*A*b*d*f*g^2)/(6*b*d) -
 (A*g^3*(2*a*d + 2*b*c))/(6*b*d)) + (A*g^3*x^4)/4 - (log(a + b*x)*(B*a^4*g^
3 - 4*B*a*b^3*f^3 + 6*B*a^2*b^2*f^2*g - 4*B*a^3*b*f*g^2))/(2*b^4) + (log(c
+ d*x)*(B*c^4*g^3 - 4*B*c*d^3*f^3 + 6*B*c^2*d^2*f^2*g - 4*B*c^3*d*f*g^2))/(
2*d^4)
```

sympy [B] time = 12.64, size = 998, normalized size = 4.36

$$\frac{Ag^3x^4}{4}-\frac{Ba\left(ag-2bf\right)\left(a^2g^2-2abfg+2b^2f^2\right)\log\left(x+\frac{Ba^4cd^3g^3-4Ba^3bcd^3fg^2+6Ba^2b^2cd^3f^2g+\frac{Ba^2d^4\left(ag-2bf\right)\left(a^2g^2-2abfg+2b^2f^2\right)}{b}+}{Ba^4d^4g^3-4Ba^3bd^4fg^2+6Ba^2b^2d^4f^2g-4B}\right.}{2b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g**3*x**4/4 - B*a*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)*log
(x + (B*a**4*c*d**3*g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*
f**2*g + B*a**2*d**4*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)/b
+ B*a*b**3*c**4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2
```

```
*g - 8*B*a*b**3*c*d**3*f**3 - B*a*c*d**3*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f
*g + 2*b**2*f**2))/(B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b*
*2*d**4*f**2*g - 4*B*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*
f*g**2 + 6*B*b**4*c**2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(2*b**4) + B*c*
(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)*log(x + (B*a**4*c*d**3*
g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*f**2*g + B*a*b**3*c*
*4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2*g - 8*B*a*b*
*3*c*d**3*f**3 - B*a*b**3*c*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f
**2) + B*b**4*c**2*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)/d)/(
B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b**2*d**4*f**2*g - 4*B
*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*f*g**2 + 6*B*b**4*c*
*2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(2*d**4) + x**3*(A*f*g**2 + B*a*g**
3/(6*b) - B*c*g**3/(6*d)) + x**2*(3*A*f**2*g/2 - B*a**2*g**3/(4*b**2) + B*a
*f*g**2/b + B*c**2*g**3/(4*d**2) - B*c*f*g**2/d) + x*(A*f**3 + B*a**3*g**3/
(2*b**3) - 2*B*a**2*f*g**2/b**2 + 3*B*a*f**2*g/b - B*c**3*g**3/(2*d**3) + 2
*B*c**2*f*g**2/d**2 - 3*B*c*f**2*g/d) + (B*f**3*x + 3*B*f**2*g*x**2/2 + B*f
*g**2*x**3 + B*g**3*x**4/4)*log(e*(a + b*x)**2/(c + d*x)**2)
```

3.264 $\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=152

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3g}-\frac{2B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{2Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{Bg^2x^2(bc-ad)}{3bd}$$

```
[Out] -2/3*B*(-a*d+b*c)*g*(-a*d*g-b*c*g+3*b*d*f)*x/b^2/d^2-1/3*B*(-a*d+b*c)*g^2*x
^2/b/d-2/3*B*(-a*g+b*f)^3*ln(b*x+a)/b^3/g+1/3*(g*x+f)^3*(A+B*ln(e*(b*x+a)^2
/(d*x+c)^2))/g+2/3*B*(-c*g+d*f)^3*ln(d*x+c)/d^3/g
```

Rubi [A] time = 0.16, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = $\{2525, 12, 72\}$

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3g}-\frac{2Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{2B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2x^2(bc-ad)}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (-2*B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*g^2*x^2)/(3*b*d) - (2*B*(b*f - a*g)^3*Log[a + b*x])/(3*b^3*g) + ((f + g*
x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*g) + (2*B*(d*f - c*g)^3*L
og[c + d*x])/(3*d^3*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3g} - \frac{B\int \frac{2(bc-ad)(f+gx)^3}{(a+bx)(c+dx)}\,dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3g} - \frac{(2B(bc-ad))\int \frac{(f+gx)^3}{(a+bx)(c+dx)}\,dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3g} - \frac{(2B(bc-ad))\int\left(\frac{g^2(3bdf-bcg-adg}{b^2d^2}\right.}{}$$

$$= -\frac{2B(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{B(bc-ad)g^2x^2}{3bd} - \frac{2B(bf-a}{}$$

Mathematica [A] time = 0.14, size = 142, normalized size = 0.93

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right) - \frac{B\left(b^2d^2g^3x^2(bc-ad)+2bdg^2x(bc-ad)(-adg-bcg+3bdf)+2d^3(bf-ag)^3\log(a+bx)-2b^3(df-cg)^3\log(c+d\right.}{b^3d^3}}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - (B*(2*b*d*(b*c - a*
d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + b^2*d^2*(b*c - a*d)*g^3*x^2 + 2*d^3*(b
*f - a*g)^3*Log[a + b*x] - 2*b^3*(d*f - c*g)^3*Log[c + d*x]))/(b^3*d^3))/(3
*g)
```

fricas [B] time = 0.99, size = 301, normalized size = 1.98

$$\frac{Ab^3d^3g^2x^3 + \left(3\,Ab^3d^3fg - \left(Bb^3cd^2 - Bab^2d^3\right)g^2\right)x^2 + \left(3\,Ab^3d^3f^2 - 6\left(Bb^3cd^2 - Bab^2d^3\right)fg + 2\left(Bb^3c^2d - Ba\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/3*(A*b^3*d^3*g^2*x^3 + (3*A*b^3*d^3*f*g - (B*b^3*c*d^2 - B*a*b^2*d^3)*g^2
)*x^2 + (3*A*b^3*d^3*f^2 - 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*f*g + 2*(B*b^3*c^2
*d - B*a^2*b*d^3)*g^2)*x + 2*(3*B*a*b^2*d^3*f^2 - 3*B*a^2*b*d^3*f*g + B*a^3
*d^3*g^2)*log(b*x + a) - 2*(3*B*b^3*c*d^2*f^2 - 3*B*b^3*c^2*d*f*g + B*b^3*c
^3*g^2)*log(d*x + c) + (B*b^3*d^3*g^2*x^3 + 3*B*b^3*d^3*f*g*x^2 + 3*B*b^3*d
^3*f^2*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(
b^3*d^3)
```

giac [A] time = 12.58, size = 279, normalized size = 1.84

$$\frac{1}{3}\left(Ag^2+Bg^2\right)x^3 + \frac{1}{3}\left(Bg^2x^3 + 3\,Bfgx^2 + 3\,Bf^2x\right)\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right) + \frac{\left(3\,Abdfg + 3\,Bbdfg - Bbcg^2 + B\right.}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] 1/3*(A*g^2 + B*g^2)*x^3 + 1/3*(B*g^2*x^3 + 3*B*f*g*x^2 + 3*B*f^2*x)*log((b^
2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) + 1/3*(3*A*b*d*f*g + 3*B*
b*d*f*g - B*b*c*g^2 + B*a*d*g^2)*x^2/(b*d) + 2/3*(3*B*a*b^2*f^2 - 3*B*a^2*b
```

```
*f*g + B*a^3*g^2)*log(b*x + a)/b^3 - 2/3*(3*B*c*d^2*f^2 - 3*B*c^2*d*f*g + B
*c^3*g^2)*log(-d*x - c)/d^3 + 1/3*(3*A*b^2*d^2*f^2 + 3*B*b^2*d^2*f^2 - 6*B*
b^2*c*d*f*g + 6*B*a*b*d^2*f*g + 2*B*b^2*c^2*g^2 - 2*B*a^2*d^2*g^2)*x/(b^2*d
^2)
```

maple [B] time = 0.08, size = 1188, normalized size = 7.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] A*x*f^2+1/3*A*x^3*g^2+1/3/d^3*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)
*c^3*g^2+1/3/d^3*A*c^3*g^2+1/d*A*c*f^2+1/3*B*g^2*ln((1/(d*x+c)*a*d-1/(d*x+c
)*b*c+b)^2/d^2*e)*x^3+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x*f^2+A
*x^2*f*g+1/d^3*B*c^3*g^2-4*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*
a^2*c*f*g-4/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*b*f*g+4/d
*B*g/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c*f+8/d*B/(a*d-b*c)*ln(1/(d*x+c)
*a*d-1/(d*x+c)*b*c+b)*a*c^2*f*g+2/d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c
)*b*c+b)*a^2*c^2*g^2-2/3*B*g^2*a^2/b^2*x+1/3*B*g^2*a/b*x^2+2/d*B*ln(1/(d*x+
c))*c*f^2+2/3*B*g^2*a^3/b^3*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)-2/3*B*g^2*a^3
/b^3*ln(1/(d*x+c))+B*g*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f*x^2+1/
d*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c*f^2+4/3/d^3*B*ln(1/(d*x+c
)*a*d-1/(d*x+c)*b*c+b)*c^3*g^2-2*B/b*ln(1/(d*x+c))*a*f^2-1/3/d*B*g^2*c*x^2+
2/3/d^2*B*c^2*g^2*x+2/3/d^3*B*ln(1/(d*x+c))*c^3*g^2-1/d^2*A*c^2*f*g-2/d^2*B
*g*c^2*f-2*B*g/b^2*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*f-2/d*B*g*c*f*x-2/
d^2*B*ln(1/(d*x+c))*c^2*f*g-1/d^2*B*g*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/
d^2*e)*f*c^2-2/d^2*B*g*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2*f+2*B*g/b^2*ln
(1/(d*x+c))*a^2*f-4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c*f^2+2
*B*g/b*a*f*x-2/3/d*B*g^2*a^2/b^2*c-1/3/d^2*B*g^2*a/b*c^2-4/d^2*B/(a*d-b*c)*
ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c^3*g^2+2*d*B/b/(a*d-b*c)*ln(1/(d*x+c)*
a*d-1/(d*x+c)*b*c+b)*a^2*f^2-2/d^2*B/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*
c^2*g^2+2/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2*b*f^2+2/d^3*B
/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^4*b*g^2+2/d*B*g/b*a*c*f
```

maxima [B] time = 0.79, size = 419, normalized size = 2.76

$$\frac{1}{3}\,Ag^{2}x^{3}+Afgx^{2}+\left(x\log\left(\frac{b^{2}ex^{2}}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{2\,abex}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+\frac{2\,a\log\left(bx+a\right)}{b}-2\,c\,\mathrm{lo}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/3*A*g^2*x^3 + A*f*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*
a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*
log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*f^2 + (x^2*log(b^2*e*x^2/(d^2*x^2 +
2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c
*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a
*d)*x/(b*d))*B*f*g + 1/3*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a
*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3
*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(
b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*g^2 + A*f^2*x
```

mupad [B] time = 4.79, size = 362, normalized size = 2.38

$$\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\,\left(B\,f^2\,x+B\,f\,g\,x^2+\frac{B\,g^2\,x^3}{3}\right)+x^2\,\left(\frac{3\,A\,a\,d\,g^2+3\,A\,b\,c\,g^2+2\,B\,a\,d\,g^2-2\,B\,b\,c\,g^2+6\,A\,b\,d\,f\,g}{6\,b\,d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] log((e*(a + b*x)^2)/(c + d*x)^2)*((B*g^2*x^3)/3 + B*f^2*x + B*f*g*x^2) + x^
2*((3*A*a*d*g^2 + 3*A*b*c*g^2 + 2*B*a*d*g^2 - 2*B*b*c*g^2 + 6*A*b*d*f*g)/(6
*b*d) - (A*g^2*(3*a*d + 3*b*c))/(6*b*d)) - x*((((3*A*a*d*g^2 + 3*A*b*c*g^2
+ 2*B*a*d*g^2 - 2*B*b*c*g^2 + 6*A*b*d*f*g)/(3*b*d) - (A*g^2*(3*a*d + 3*b*c)
)/(3*b*d))*(3*a*d + 3*b*c))/(3*b*d) - (3*A*a*c*g^2 + 3*A*b*d*f^2 + 6*A*a*d*
f*g + 6*A*b*c*f*g + 6*B*a*d*f*g - 6*B*b*c*f*g)/(3*b*d) + (A*a*c*g^2)/(b*d))
 + (log(a + b*x)*(2*B*a^3*g^2 + 6*B*a*b^2*f^2 - 6*B*a^2*b*f*g))/(3*b^3) - (
log(c + d*x)*(2*B*c^3*g^2 + 6*B*c*d^2*f^2 - 6*B*c^2*d*f*g))/(3*d^3) + (A*g^
2*x^3)/3
```

sympy [B] time = 6.81, size = 692, normalized size = 4.55

$$\frac{Ag^2x^3}{3}+\frac{2Ba\left(a^2g^2-3abfg+3b^2f^2\right)\log\left(x+\frac{2Ba^3cd^2g^2-6Ba^2bcd^2fg+\frac{2Ba^2d^3\left(a^2g^2-3abfg+3b^2f^2\right)}{b}+2Bab^2c^3g^2-6Bab^2c^2dfg+12Bab}{2Ba^3d^3g^2-6Ba^2bd^3fg+6Bab^2d^3f^2+2Bb^3c^3g^2-6Bb^3c^2dfg}\right.}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g**2*x**3/3 + 2*B*a*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2)*log(x + (2*B*a*
*3*c*d**2*g**2 - 6*B*a**2*b*c*d**2*f*g + 2*B*a**2*d**3*(a**2*g**2 - 3*a*b*f
*g + 3*b**2*f**2)/b + 2*B*a*b**2*c**3*g**2 - 6*B*a*b**2*c**2*d*f*g + 12*B*a
*b**2*c*d**2*f**2 - 2*B*a*c*d**2*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2))/(2*
B*a**3*d**3*g**2 - 6*B*a**2*b*d**3*f*g + 6*B*a*b**2*d**3*f**2 + 2*B*b**3*c*
*3*g**2 - 6*B*b**3*c**2*d*f*g + 6*B*b**3*c*d**2*f**2))/(3*b**3) - 2*B*c*(c*
*2*g**2 - 3*c*d*f*g + 3*d**2*f**2)*log(x + (2*B*a**3*c*d**2*g**2 - 6*B*a**2
*b*c*d**2*f*g + 2*B*a*b**2*c**3*g**2 - 6*B*a*b**2*c**2*d*f*g + 12*B*a*b**2*
c*d**2*f**2 - 2*B*a*b**2*c*(c**2*g**2 - 3*c*d*f*g + 3*d**2*f**2) + 2*B*b**3
*c**2*(c**2*g**2 - 3*c*d*f*g + 3*d**2*f**2)/d)/(2*B*a**3*d**3*g**2 - 6*B*a*
*2*b*d**3*f*g + 6*B*a*b**2*d**3*f**2 + 2*B*b**3*c**3*g**2 - 6*B*b**3*c**2*d
*f*g + 6*B*b**3*c*d**2*f**2))/(3*d**3) + x**2*(A*f*g + B*a*g**2/(3*b) - B*c
*g**2/(3*d)) + x*(A*f**2 - 2*B*a**2*g**2/(3*b**2) + 2*B*a*f*g/b + 2*B*c**2*
g**2/(3*d**2) - 2*B*c*f*g/d) + (B*f**2*x + B*f*g*x**2 + B*g**2*x**3/3)*log(
e*(a + b*x)**2/(c + d*x)**2)
```

3.265 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=104

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{b^2g}-\frac{Bgx(bc-ad)}{bd}+\frac{B(df-cg)^2\log(c+dx)}{d^2g}$$

```
[Out] -B*(-a*d+b*c)*g*x/b/d-B*(-a*g+b*f)^2*ln(b*x+a)/b^2/g+1/2*(g*x+f)^2*(A+B*ln(
e*(b*x+a)^2/(d*x+c)^2))/g+B*(-c*g+d*f)^2*ln(d*x+c)/d^2/g
```

Rubi [**A**] time = 0.09, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$, Rules used = $\{2525, 12, 72\}$

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{b^2g}-\frac{Bgx(bc-ad)}{bd}+\frac{B(df-cg)^2\log(c+dx)}{d^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -((B*(b*c - a*d)*g*x)/(b*d)) - (B*(b*f - a*g)^2*Log[a + b*x])/(b^2*g) + ((f
 + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*g) + (B*(d*f - c*g)^
2*Log[c + d*x])/(d^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx &= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g} - \frac{B\int \frac{2(bc-ad)(f+gx)^2}{(a+bx)(c+dx)}\,dx}{2g} \\ &= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g} - \frac{(B(bc-ad))\int \frac{(f+gx)^2}{(a+bx)(c+dx)}\,dx}{g} \\ &= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g} - \frac{(B(bc-ad))\int \left(\frac{g^2}{bd} + \frac{(bf-ag)^2}{b(bc-ad)(a+bx}\right.}{g} \\ &= -\frac{B(bc-ad)gx}{bd} - \frac{B(bf-ag)^2\log(a+bx)}{b^2g} + \frac{(f+gx)^2\left(A+B\log\left(\right.\right.}{2g}\end{aligned}$$

Mathematica [A] time = 0.11, size = 118, normalized size = 1.13

$$\frac{b\left(d\left(2Bg^2x(ad-bc)+Abd(f+gx)^2\right)+bBd^2(f+gx)^2\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+2bB(df-cg)^2\log(c+dx)\right)-2Bd^2(bf}{2b^2d^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (-2*B*d^2*(b*f - a*g)^2*Log[a + b*x] + b*(d*(2*B*(-(b*c) + a*d)*g^2*x + A*b
*d*(f + g*x)^2) + b*B*d^2*(f + g*x)^2*Log[(e*(a + b*x)^2)/(c + d*x)^2] + 2*
b*B*(d*f - c*g)^2*Log[c + d*x]))/(2*b^2*d^2*g)
```

fricas [A] time = 0.87, size = 174, normalized size = 1.67

$$\frac{Ab^2d^2gx^2+2\left(Ab^2d^2f-\left(Bb^2cd-Babd^2\right)g\right)x+2\left(2\,Babd^2f-Ba^2d^2g\right)\log\left(bx+a\right)-2\left(2\,Bb^2cdf-Bb^2c^2g\right)\mathrm{l}}{2\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + 2*(A*b^2*d^2*f - (B*b^2*c*d - B*a*b*d^2)*g)*x + 2*(2
*B*a*b*d^2*f - B*a^2*d^2*g)*log(b*x + a) - 2*(2*B*b^2*c*d*f - B*b^2*c^2*g)*
log(d*x + c) + (B*b^2*d^2*g*x^2 + 2*B*b^2*d^2*f*x)*log((b^2*e*x^2 + 2*a*b*e
*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b^2*d^2)
```

giac [A] time = 1.11, size = 145, normalized size = 1.39

$$\frac{1}{2}\left(Ag+Bg\right)x^2+\frac{1}{2}\left(Bgx^2+2\,Bfx\right)\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right)+\frac{\left(Abdf+Bbdf-Bbcg+Badg\right)x}{bd}+\frac{\left(2\,Babf-Ba^2\right.}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] 1/2*(A*g + B*g)*x^2 + 1/2*(B*g*x^2 + 2*B*f*x)*log((b^2*x^2 + 2*a*b*x + a^2)
/(d^2*x^2 + 2*c*d*x + c^2)) + (A*b*d*f + B*b*d*f - B*b*c*g + B*a*d*g)*x/(b*
d) + (2*B*a*b*f - B*a^2*g)*log(b*x + a)/b^2 - (2*B*c*d*f - B*c^2*g)*log(-d*
x - c)/d^2
```

maple [B] time = 0.08, size = 656, normalized size = 6.31

$$-\frac{2B\,a^2cg\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{(ad-bc)\,b}+\frac{2B\,a^2df\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{(ad-bc)\,b}+\frac{4Ba\,c^2g\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{(ad-bc)\,d}-\frac{4Bacf\ln\left(\frac{ad}{dx+c}-\right.}{ad-bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] -2/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^3*b*g+1/2*B*g*ln((1/
(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x^2+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c
+b)^2/d^2*e)*x*f-1/2/d^2*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c^2*
g-1/d^2*B*g*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2-1/d^2*B*ln(1/(d*x+c))*c^2
*g+1/d*B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c*f-B*g/b^2*ln(1/(d*x+
c)*a*d-1/(d*x+c)*b*c+b)*a^2+2/d*B*ln(1/(d*x+c))*c*f-1/d*B*c*g*x+B*g/b^2*ln(
1/(d*x+c))*a^2-2*B/b*ln(1/(d*x+c))*a*f+B*g/b*a*x-1/d^2*B*c^2*g-1/2/d^2*A*c^
2*g+1/d*A*c*f+1/2*A*x^2*g+A*x*f-4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*
c+b)*a*c*f+1/d*B*g/b*a*c+2/d*B*g/b*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c+2*
d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2*f+2/d*B/(a*d-b*c)*ln(
1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2*b*f+4/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(
d*x+c)*b*c+b)*a*c^2*g-2*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a^2
*c*g
```

maxima [B] time = 0.76, size = 246, normalized size = 2.37

$$\frac{1}{2}Agx^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2cdx+c^2}+\frac{2abex}{d^2x^2+2cdx+c^2}+\frac{a^2e}{d^2x^2+2cdx+c^2}\right)+\frac{2a\log(bx+a)}{b}-\frac{2c\log(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/2*A*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x
^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b
 - 2*c*log(d*x + c)/d)*B*f + 1/2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^
2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))
 - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))
*B*g + A*f*x
```

mupad [B] time = 4.50, size = 133, normalized size = 1.28

$$\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\left(\frac{B\,g\,x^2}{2}+B\,f\,x\right)+x\left(\frac{A\,a\,d\,g+A\,b\,c\,g+A\,b\,d\,f+B\,a\,d\,g-B\,b\,c\,g}{b\,d}-\frac{A\,g\,(a\,d+b\,c)}{b\,d}\right)+\frac{A\,g\,x^2}{2}-\frac{B}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] log((e*(a + b*x)^2)/(c + d*x)^2)*(B*f*x + (B*g*x^2)/2) + x*((A*a*d*g + A*b*
c*g + A*b*d*f + B*a*d*g - B*b*c*g)/(b*d) - (A*g*(a*d + b*c))/(b*d)) + (A*g*
x^2)/2 - (B*a*log(a + b*x)*(a*g - 2*b*f))/b^2 + (B*c*log(c + d*x)*(c*g - 2*
d*f))/d^2
```

sympy [B] time = 2.79, size = 314, normalized size = 3.02

$$\frac{Agx^2}{2}-\frac{Ba\left(ag-2bf\right)\log\left(x+\frac{Ba^2cdg+\frac{Ba^2d^2\left(ag-2bf\right)}{b}+Babc^2g-4Babcdf-Bacd\left(ag-2bf\right)}{Ba^2d^2g-2Babd^2f+Bb^2c^2g-2Bb^2cdf}\right)}{b^2}+\frac{Bc\left(cg-2df\right)\log\left(x+\frac{Ba^2cdg+Babc^2g}{Ba^2d^2}\right.}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g*x**2/2 - B*a*(a*g - 2*b*f)*log(x + (B*a**2*c*d*g + B*a**2*d**2*(a*g - 2
*b*f)/b + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*c*d*(a*g - 2*b*f))/(B*a**2*d**
2*g - 2*B*a*b*d**2*f + B*b**2*c**2*g - 2*B*b**2*c*d*f))/b**2 + B*c*(c*g - 2
```

```
*d*f)*log(x + (B*a**2*c*d*g + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*b*c*(c*g -
 2*d*f) + B*b**2*c**2*(c*g - 2*d*f)/d)/(B*a**2*d**2*g - 2*B*a*b*d**2*f + B*
b**2*c**2*g - 2*B*b**2*c*d*f))/d**2 + x*(A*f + B*a*g/b - B*c*g/d) + (B*f*x
+ B*g*x**2/2)*log(e*(a + b*x)**2/(c + d*x)**2)
```

3.266 $\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx$

Optimal. Leaf size=54

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x+B*(b*x+a)*ln(e*(b*x+a)^2/(d*x+c)^2)/b-2*B*(-a*d+b*c)*ln(d*x+c)/b/d
```

Rubi [A] time = 0.03, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/b - (2*B*(b*c - a*d)*L
og[c + d*x])/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rubi steps

$$\begin{aligned}\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx &= Ax+B\int \log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)dx\\ &= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{(2B(bc-ad))\int \frac{1}{c+dx}\,dx}{b}\\ &= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}\end{aligned}$$

Mathematica [A] time = 0.02, size = 54, normalized size = 1.00

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/b - (2*B*(b*c - a*d)*L
og[c + d*x])/(b*d)
```

fricas [**A**] time = 0.87, size = 80, normalized size = 1.48

$$\frac{Bbdx\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+Abdx+2\,Bad\log\left(bx+a\right)-2\,Bbc\log\left(dx+c\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^2/(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] (B*b*d*x*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) + A
*b*d*x + 2*B*a*d*log(b*x + a) - 2*B*b*c*log(d*x + c))/(b*d)
```

giac [**A**] time = 0.26, size = 83, normalized size = 1.54

$$\left(2\left(bc-ad\right)\left(\frac{a\log\left(|bx+a|\right)}{b^2c-abd}-\frac{c\log\left(|dx+c|\right)}{bcd-ad^2}\right)+x\log\left(\frac{\left(bx+a\right)^2e}{\left(dx+c\right)^2}\right)\right)B+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^2/(d*x+c)^2),x, algorithm="giac")
```

```
[Out] (2*(b*c - a*d)*(a*log(abs(b*x + a))/(b^2*c - a*b*d) - c*log(abs(d*x + c))/(
b*c*d - a*d^2)) + x*log((b*x + a)^2*e/(d*x + c)^2))*B + A*x
```

maple [**B**] time = 0.06, size = 233, normalized size = 4.31

$$\frac{2B\,a^2d\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{\left(ad-bc\right)b}-\frac{4Bac\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{ad-bc}+\frac{2Bb\,c^2\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)}{\left(ad-bc\right)d}+Bx\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2}{d^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(B*ln((b*x+a)^2/(d*x+c)^2*e)+A,x)
```

```
[Out] A*x+B*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*x+B/d*ln((1/(d*x+c)*a*d-1
/(d*x+c)*b*c+b)^2/d^2*e)*c+2*B*d/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c
+b)*a^2-4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*a*c+2*B/d/(a*d-b*c)
*ln(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)*c^2*b-2*B/b*ln(1/(d*x+c))*a+2*B/d*ln(1/(
d*x+c))*c
```

maxima [**A**] time = 0.63, size = 57, normalized size = 1.06

$$\left(x\log\left(\frac{\left(bx+a\right)^2e}{\left(dx+c\right)^2}\right)+\frac{2\left(\frac{ae\log\left(bx+a\right)}{b}-\frac{ce\log\left(dx+c\right)}{d}\right)}{e}\right)B+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^2/(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] (x*log((b*x + a)^2*e/(d*x + c)^2) + 2*(a*e*log(b*x + a)/b - c*e*log(d*x + c
)/d)/e)*B + A*x
```

mupad [**B**] time = 4.29, size = 50, normalized size = 0.93

$$A\,x+B\,x\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)+\frac{2\,B\,a\,\ln\left(a+b\,x\right)}{b}-\frac{2\,B\,c\,\ln\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A + B*log((e*(a + b*x)^2)/(c + d*x)^2),x)
```

```
[Out] A*x + B*x*log((e*(a + b*x)^2)/(c + d*x)^2) + (2*B*a*log(a + b*x))/b - (2*B*
c*log(c + d*x))/d
```

sympy [B] time = 1.07, size = 104, normalized size = 1.93

$$Ax + \frac{2Ba\log\left(x + \frac{\frac{2Ba^2d}{b} + 2Bac}{2Bad + 2Bbc}\right)}{b} - \frac{2Bc\log\left(x + \frac{2Bac + \frac{2Bbc^2}{d}}{2Bad + 2Bbc}\right)}{d} + Bx\log\left(\frac{e\left(a + bx\right)^2}{\left(c + dx\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*(b*x+a)**2/(d*x+c)**2),x)
```

```
[Out] A*x + 2*B*a*log(x + (2*B*a**2*d/b + 2*B*a*c)/(2*B*a*d + 2*B*b*c))/b - 2*B*c
*log(x + (2*B*a*c + 2*B*b*c**2/d)/(2*B*a*d + 2*B*b*c))/d + B*x*log(e*(a + b
*x)**2/(c + d*x)**2)
```

3.267 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{f+gx}\,dx$

Optimal. Leaf size=144

$$\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}-\frac{2B\mathrm{Li}_2\left(\frac{b(f+gx)}{bf-ag}\right)}{g}-\frac{2B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}+\frac{2B\mathrm{Li}_2\left(\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{2B\log(}{}$$

```
[Out] -2*B*ln(-g*(b*x+a)/(-a*g+b*f))*ln(g*x+f)/g+(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*
ln(g*x+f)/g+2*B*ln(-g*(d*x+c)/(-c*g+d*f))*ln(g*x+f)/g-2*B*polylog(2,b*(g*x+
f)/(-a*g+b*f))/g+2*B*polylog(2,d*(g*x+f)/(-c*g+d*f))/g
```

Rubi [**A**] time = 0.31, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.207$, Rules used = {2524, 12, 2418, 2394, 2393, 2391}

$$-\frac{2B\mathrm{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{2B\mathrm{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}-\frac{2B\log(f+gx)\log\left(\right.}{g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x),x]
```

```
[Out] (-2*B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g + ((A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/g + (2*B*Log[-((g*(c + d*x))/(d*f -
c*g))]*Log[f + g*x])/g - (2*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2
*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{f+gx}\,dx &= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}-\frac{B\int\frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(f+gx)}{e(a+bx)^2}\,dx}{g}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}-\frac{B\int\frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(f+gx)}{(a+bx)^2}\,dx}{eg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}-\frac{B\int\left(\frac{2be\log(f+gx)}{a+bx}-\frac{2de\log(f+gx)}{c+dx}\right)dx}{eg}\\
&= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}-\frac{(2bB)\int\frac{\log(f+gx)}{a+bx}\,dx}{g}+\frac{(2Bd)\int\frac{\log(f+gx)}{c+dx}\,dx}{g}\\
&= -\frac{2B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g}+\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}+\frac{2B\log\left(-\frac{g(c}{d}\right.}{}\\
&= -\frac{2B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g}+\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}+\frac{2B\log\left(-\frac{g(c}{d}\right.}{}\\
&= -\frac{2B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g}+\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g}+\frac{2B\log\left(-\frac{g(c}{d}\right.}{}
\end{aligned}
$$

Mathematica [A] time = 0.06, size = 119, normalized size = 0.83

$$
\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)-2B\log\left(\frac{g(a+bx)}{ag-bf}\right)+A+2B\log\left(\frac{g(c+dx)}{cg-df}\right)\right)-2B\operatorname{Li}_2\left(\frac{b(f+gx)}{bf-ag}\right)+2B\operatorname{Li}_2\left(\frac{d(f+gx)}{df-cg}\right)}{g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x),x]
```

```
[Out] ((A - 2*B*Log[(g*(a + b*x))/(-(b*f) + a*g)] + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2] + 2*B*Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] - 2*B*PolyLog[2
, (b*(f + g*x))/(b*f - a*g)] + 2*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$
\operatorname{integral}\left(\frac{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A}{gx+f},x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A)/(g*x + f), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}{gx+f}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)/(g*x + f), x)
```

maple [B] time = 0.15, size = 1143, normalized size = 7.94

$$-\frac{2Bacd \ln\left(\frac{adg-bdf+\left(-g+\frac{cg-df}{dx+c}\right)(ad-bc)}{adg-bdf}\right) \ln\left(-g+\frac{cg-df}{dx+c}\right)}{\left(cg-df\right)(ad-bc)}+\frac{2Ba\, d^2 f \ln\left(\frac{adg-bdf+\left(-g+\frac{cg-df}{dx+c}\right)(ad-bc)}{adg-bdf}\right) \ln\left(-g+\frac{cg-df}{dx+c}\right)}{\left(cg-df\right)(ad-bc)\, g}+-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)/(g*x+f),x)
```

```
[Out] A/g*ln(1/(d*x+c)*c*g-d/(d*x+c)*f-g)-A/g*ln(1/(d*x+c))+B*ln((c*g-d*f)/(d*x+c
)-g)/(c*g-d*f)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c-d*B/g*ln((c*g-
d*f)/(d*x+c)-g)/(c*g-d*f)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f-2*d
*B/(c*g-d*f)*dilog((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d
*f))/(a*d-b*c)*a*c+2*d^2*B/g/(c*g-d*f)*dilog((((c*g-d*f)/(d*x+c)-g)*(a*d-b*
c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*a*f+2*B/(c*g-d*f)*dilog((((c*g-d*f
)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*b*c^2-2*d*B/g/
(c*g-d*f)*dilog((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f)
)/(a*d-b*c)*b*c*f-2*d*B/(c*g-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f)/(d
*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*a*c+2*d^2*B/g/(c*g
-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d
*f)/(a*d*g-b*d*f))/(a*d-b*c)*a*f+2*B/(c*g-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((
((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*b*c^2
-2*d*B/g/(c*g-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f)/(d*x+c)-g)*(a*d-b
*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*b*c*f-B/g*ln(1/(d*x+c))*ln((1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+2*d*B/g*dilog((b+1/(d*x+c)*(a*d-b*c))/b)
/(a*d-b*c)*a-2*B/g*dilog((b+1/(d*x+c)*(a*d-b*c))/b)/(a*d-b*c)*b*c+2*d*B/g*l
n(1/(d*x+c))*ln((b+1/(d*x+c)*(a*d-b*c))/b)/(a*d-b*c)*a-2*B/g*ln(1/(d*x+c))*
ln((b+1/(d*x+c)*(a*d-b*c))/b)/(a*d-b*c)*b*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-B \int -\frac{2\,\log\left(bx+a\right) - 2\,\log\left(dx+c\right) + \log(e)}{gx+f}\, dx + \frac{A \log\left(gx+f\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(2*log(b*x + a) - 2*log(d*x + c) + log(e))/(g*x + f), x) + A*
log(g*x + f)/g
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A + B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)}{f+g\,x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(f + g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(f + g*x), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A + B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2} + \frac{2abex}{c^2+2cdx+d^2x^2} + \frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}{f + gx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f),x)
```

```
[Out] Integral((A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 +
 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)))/(f + g*x
), x)
```

3.268 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^2}\,dx$

Optimal. Leaf size=90

$$\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{(f+gx)(bf-ag)}+\frac{2B(bc-ad)\log\left(\frac{f+gx}{c+dx}\right)}{(bf-ag)(df-cg)}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)/(g*x+f)+2*B*(-a*d+b*c)*l
n((g*x+f)/(d*x+c))/(-a*g+b*f)/(-c*g+d*f)
```

Rubi [A] time = 0.09, antiderivative size = 117, normalized size of antiderivative = 1.30, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{g(f+gx)}+\frac{2B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}+\frac{2bB\log(a+bx)}{g(bf-ag)}-\frac{2Bd\log(c+dx)}{g(df-cg)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^2,x]
```

```
[Out] (2*b*B*Log[a + b*x])/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2])/(g*(f + g*x)) - (2*B*d*Log[c + d*x])/(g*(d*f - c*g)) + (2*B*(b*c - a*d
)*Log[f + g*x])/((b*f - a*g)*(d*f - c*g))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)}+\frac{B\int\frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}\\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)}+\frac{(2B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)}\,dx}{g}\\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)}+\frac{(2B(bc-ad))\int\left(\frac{b^2}{(bc-ad)(bf-ag)(a+bx)}+\frac{d^2}{(bc-ad)(-df+cg)(c+dx)}+\right.}{g}\\
&= \frac{2bB\log(a+bx)}{g(bf-ag)}-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)}-\frac{2Bd\log(c+dx)}{g(df-cg)}+\frac{2B(bc-ad)\log(f+g}{(bf-ag)(df-cg)}
\end{aligned}
$$

Mathematica [**A**]   time = 0.13, size = 108, normalized size = 1.20

$$
\frac{\frac{2B(b\log(a+bx)(df-cg)+\log(c+dx)(adg-bdf)+g(bc-ad)\log(f+gx))}{(bf-ag)(df-cg)}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{f+gx}}{g}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)) + (2*B*(b*(d*f - c*g
)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*
x]))/((b*f - a*g)*(d*f - c*g)))/g
```

fricas [**B**]   time = 10.61, size = 279, normalized size = 3.10

$$
-\frac{Abdf^2+Aacg^2-(Abc+Aad)fg-2\left(Bbdf^2-Bbcfg+\left(Bbdfg-Bbcg^2\right)x\right)\log(bx+a)+2\left(Bbdf^2-Badfg\right.}{bdf^3g+acfg^3-}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] -(A*b*d*f^2 + A*a*c*g^2 - (A*b*c + A*a*d)*f*g - 2*(B*b*d*f^2 - B*b*c*f*g +
(B*b*d*f*g - B*b*c*g^2)*x)*log(b*x + a) + 2*(B*b*d*f^2 - B*a*d*f*g + (B*b*d
*f*g - B*a*d*g^2)*x)*log(d*x + c) - 2*((B*b*c - B*a*d)*g^2*x + (B*b*c - B*a
*d)*f*g)*log(g*x + f) + (B*b*d*f^2 + B*a*c*g^2 - (B*b*c + B*a*d)*f*g)*log((
b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b*d*f^3*g + a*c
*f*g^3 - (b*c + a*d)*f^2*g^2 + (b*d*f^2*g^2 + a*c*g^4 - (b*c + a*d)*f*g^3)*
x)
```

giac [**F(-2)**]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Undef
/Unsigned Inf encountered in limitUndef/Unsigned Inf encountered in limitB*
(-(g*x+f)^-1/g*ln((b*(-f+1/g/(g*x+f)^-1*g)/g+a)^2*exp(1)/(d*(-f+1/g/(g*x+f)
^-1*g)/g+c)^2)-(-2*a*d*g^2+2*b*c*g^2)*(1/(2*a*c*g^4-2*a*g^3*d*f-2*c*g^3*f*b
+2*g^2*d*f^2*b)*ln(abs((-(g*x+f)^-1/g)^2*a*c*g^4-(-(g*x+f)^-1/g)^2*a*g^3*d*
```

```
f-(-(g*x+f)^-1/g)^2*c*g^3*f*b+(-(g*x+f)^-1/g)^2*g^2*d*f^2*b+(g*x+f)^-1/g*a*
g^2*d+(g*x+f)^-1/g*c*g^2*b-2*(g*x+f)^-1/g*g*d*f*b+d*b))+(a*g*d+c*g*b-2*d*f*
b)/(2*a*c*g^3-2*a*g^2*d*f-2*c*g^2*f*b+2*g*d*f^2*b)/abs(a*g^2*d-g^2*c*b)*ln(
abs(-2*(g*x+f)^-1/g*a*c*g^4+2*(g*x+f)^-1/g*a*g^3*d*f+2*(g*x+f)^-1/g*c*g^3*f
*b-2*(g*x+f)^-1/g*g^2*d*f^2*b-a*g^2*d-c*g^2*b+2*g*d*f*b-abs(a*g^2*d-g^2*c*b
))/abs(-2*(g*x+f)^-1/g*a*c*g^4+2*(g*x+f)^-1/g*a*g^3*d*f+2*(g*x+f)^-1/g*c*g^
3*f*b-2*(g*x+f)^-1/g*g^2*d*f^2*b-a*g^2*d-c*g^2*b+2*g*d*f*b+abs(a*g^2*d-g^2*
c*b)))))-A*(g*x+f)^-1/g
```

maple [B] time = 0.09, size = 388, normalized size = 4.31

$$\frac{Bad\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2 e}{d^2}\right)}{\left(\frac{cg}{dx+c}-\frac{df}{dx+c}-g\right)\left(ag-bf\right)(dx+c)}-\frac{2Bad\ln\left(\frac{cg}{dx+c}-\frac{df}{dx+c}-g\right)}{acg^2-adfg-bcfg+bdf^2}-\frac{Bbc\ln\left(\frac{\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2 e}{d^2}\right)}{\left(\frac{cg}{dx+c}-\frac{df}{dx+c}-g\right)\left(ag-bf\right)(dx+c)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)/(g*x+f)^2,x)
```

```
[Out] d*A/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)/(c*g-d*f)+1/(1/(d*x+c)*c*g-1/(d*x+c)*d*
f-g)*b*B/(a*g-b*f)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)+d/(1/(d*x+c)
*c*g-1/(d*x+c)*d*f-g)*B/(a*g-b*f)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b
)^2/d^2*e)*a-1/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*B/(a*g-b*f)/(d*x+c)*ln((1/(d
*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*b*c-2*d*B/(a*c*g^2-a*d*f*g-b*c*f*g+b*d*
f^2)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*a+2*B/(a*c*g^2-a*d*f*g-b*c*f*g+b*d*f
^2)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*b*c
```

maxima [B] time = 0.70, size = 192, normalized size = 2.13

$$B\left(\frac{2\,b\log\left(bx+a\right)}{bfg-ag^2}-\frac{2\,d\log\left(dx+c\right)}{dfg-cg^2}+\frac{2\,(bc-ad)\log\left(gx+f\right)}{bdf^2+acg^2-(bc+ad)fg}-\frac{\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\right.}{g^2x+fg}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] B*(2*b*log(b*x + a)/(b*f*g - a*g^2) - 2*d*log(d*x + c)/(d*f*g - c*g^2) + 2*
(b*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b^2*e*
x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e
/(d^2*x^2 + 2*c*d*x + c^2))/(g^2*x + f*g)) - A/(g^2*x + f*g)
```

mupad [B] time = 5.34, size = 191, normalized size = 2.12

$$\frac{2\,B\,d\,\ln\left(c+d\,x\right)}{c\,g^2-d\,f\,g}-\frac{B\,\ln\left(\frac{e\,a^2+2\,e\,a\,b\,x+e\,b^2\,x^2}{c^2+2\,c\,d\,x+d^2\,x^2}\right)}{x\,g^2+f\,g}-\frac{2\,B\,b\,\ln\left(a+b\,x\right)}{a\,g^2-b\,f\,g}-\frac{A}{x\,g^2+f\,g}-\frac{2\,B\,a\,d\,\ln\left(f+g\,x\right)}{a\,c\,g^2+b\,d\,f^2-a\,d\,f\,g-b\,c\,f\,g}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(f + g*x)^2,x)
```

```
[Out] (2*B*d*log(c + d*x))/(c*g^2 - d*f*g) - (B*log((a^2*e + b^2*e*x^2 + 2*a*b*e*
x)/(c^2 + d^2*x^2 + 2*c*d*x)))/(f*g + g^2*x) - (2*B*b*log(a + b*x))/(a*g^2
- b*f*g) - A/(f*g + g^2*x) - (2*B*a*d*log(f + g*x))/(a*c*g^2 + b*d*f^2 - a*
d*f*g - b*c*f*g) + (2*B*b*c*log(f + g*x))/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*
c*f*g)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

3.269 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^3}\,dx$

Optimal. Leaf size=175

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{g(bf-ag)^2}-\frac{B(bc-ad)}{(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2}{(bf-ag)^2(df-cg)^2}$$

```
[Out] -B*(-a*d+b*c)/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)+b^2*B*ln(b*x+a)/g/(-a*g+b*f)^2+
1/2*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/g/(g*x+f)^2-B*d^2*ln(d*x+c)/g/(-c*g+d*
f)^2+B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*ln(g*x+f)/(-a*g+b*f)^2/(-c*g+d*f)^
2
```

Rubi **[A]** time = 0.17, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{g(bf-ag)^2}-\frac{B(bc-ad)}{(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2}{(bf-ag)^2(df-cg)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^3,x]
```

```
[Out] -((B*(b*c - a*d))/((b*f - a*g)*(d*f - c*g)*(f + g*x))) + (b^2*B*Log[a + b*x
])/(g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*g*(f + g
*x)^2) - (B*d^2*Log[c + d*x])/(g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f -
 b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^3}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2} + \frac{B\int \frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2} + \frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2} + \frac{(B(bc-ad))\int \left(\frac{b^3}{(bc-ad)(bf-ag)^2(a+bx)} - \frac{d^3}{(bc-ad)(-df+cg)^2(c+dx)} + \right.}{g}$$

$$= -\frac{B(bc-ad)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)}{g(bf-ag)^2} - \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2} - \frac{Bd^2\log(c}{g(df-c}$$

Mathematica [**A**] time = 0.55, size = 172, normalized size = 0.98

$$\frac{2B(bc-ad)\left(\frac{b^2\log(a+bx)}{(bc-ad)(bf-ag)^2} + \frac{\frac{d^2\log(c+dx)}{ad-bc}+\frac{g(cg-df)}{(f+gx)(bf-ag)}-\frac{g\log(f+gx)(adg+bcg-2bdf)}{(bf-ag)^2}}{(df-cg)^2}\right) - \frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{(f+gx)^2}}{2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^3,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^2) + 2*B*(b*c - a*d)*
((b^2*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + ((g*(-(d*f) + c*g))/((b*f
 - a*g)*(f + g*x)) + (d^2*Log[c + d*x])/(-(b*c) + a*d) - (g*(-2*b*d*f + b*c
*g + a*d*g)*Log[f + g*x])/(b*f - a*g)^2)/(d*f - c*g)^2))/(2*g)
```

fricas [**B**] time = 151.72, size = 1036, normalized size = 5.92

$$-\frac{Ab^2d^2f^4 + Aa^2c^2g^4 - 2\left((A-B)b^2cd + (A+B)abd^2\right)f^3g + \left((A-2B)b^2c^2 + 4Aabcd + (A+2B)a^2d^2\right)f^2g^2 - 2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(A*b^2*d^2*f^4 + A*a^2*c^2*g^4 - 2*((A - B)*b^2*c*d + (A + B)*a*b*d^2)
*f^3*g + ((A - 2*B)*b^2*c^2 + 4*A*a*b*c*d + (A + 2*B)*a^2*d^2)*f^2*g^2 - 2*
((A - B)*a*b*c^2 + (A + B)*a^2*c*d)*f*g^3 + 2*((B*b^2*c*d - B*a*b*d^2)*f^2*
g^2 - (B*b^2*c^2 - B*a^2*d^2)*f*g^3 + (B*a*b*c^2 - B*a^2*c*d)*g^4)*x - 2*(B
*b^2*d^2*f^4 - 2*B*b^2*c*d*f^3*g + B*b^2*c^2*f^2*g^2 + (B*b^2*d^2*f^2*g^2 -
 2*B*b^2*c*d*f*g^3 + B*b^2*c^2*g^4)*x^2 + 2*(B*b^2*d^2*f^3*g - 2*B*b^2*c*d*
f^2*g^2 + B*b^2*c^2*f*g^3)*x)*log(b*x + a) + 2*(B*b^2*d^2*f^4 - 2*B*a*b*d^2
*f^3*g + B*a^2*d^2*f^2*g^2 + (B*b^2*d^2*f^2*g^2 - 2*B*a*b*d^2*f*g^3 + B*a^2
*d^2*g^4)*x^2 + 2*(B*b^2*d^2*f^3*g - 2*B*a*b*d^2*f^2*g^2 + B*a^2*d^2*f*g^3)
*x)*log(d*x + c) - 2*(2*(B*b^2*c*d - B*a*b*d^2)*f^3*g - (B*b^2*c^2 - B*a^2*
d^2)*f^2*g^2 + (2*(B*b^2*c*d - B*a*b*d^2)*f*g^3 - (B*b^2*c^2 - B*a^2*d^2)*g
^4)*x^2 + 2*(2*(B*b^2*c*d - B*a*b*d^2)*f^2*g^2 - (B*b^2*c^2 - B*a^2*d^2)*f*
g^3)*x)*log(g*x + f) + (B*b^2*d^2*f^4 + B*a^2*c^2*g^4 - 2*(B*b^2*c*d + B*a*
b*d^2)*f^3*g + (B*b^2*c^2 + 4*B*a*b*c*d + B*a^2*d^2)*f^2*g^2 - 2*(B*a*b*c^2
 + B*a^2*c*d)*f*g^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
 + c^2)))/(b^2*d^2*f^6*g + a^2*c^2*f^2*g^5 - 2*(b^2*c*d + a*b*d^2)*f^5*g^2
+ (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^4*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^4 +
 (b^2*d^2*f^4*g^3 + a^2*c^2*g^7 - 2*(b^2*c*d + a*b*d^2)*f^3*g^4 + (b^2*c^2
```

```
+ 4*a*b*c*d + a^2*d^2)*f^2*g^5 - 2*(a*b*c^2 + a^2*c*d)*f*g^6)*x^2 + 2*(b^2*
d^2*f^5*g^2 + a^2*c^2*f*g^6 - 2*(b^2*c*d + a*b*d^2)*f^4*g^3 + (b^2*c^2 + 4*
a*b*c*d + a^2*d^2)*f^3*g^4 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^5)*x)
```

giac [B] time = 0.77, size = 495, normalized size = 2.83

$$\frac{Bb^3 \log \left(|bx+a|\right)}{b^3 f^2 g - 2\,ab^2 f g^2 + a^2 b g^3} - \frac{Bd^3 \log \left(|dx+c|\right)}{d^3 f^2 g - 2\,cd^2 f g^2 + c^2 d g^3} + \frac{\left(2\,Bb^2 cdf - 2\,Babd^2 f - Bb^2 c^2}{b^2 d^2 f^4 - 2\,b^2 cd f^3 g - 2\,abd^2 f^3 g + b^2 c^2 f^2 g^2 + 4\,abcdf}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] B*b^3*log(abs(b*x + a))/(b^3*f^2*g - 2*a*b^2*f*g^2 + a^2*b*g^3) - B*d^3*log
(abs(d*x + c))/(d^3*f^2*g - 2*c*d^2*f*g^2 + c^2*d*g^3) + (2*B*b^2*c*d*f - 2
*B*a*b*d^2*f - B*b^2*c^2*g + B*a^2*d^2*g)*log(g*x + f)/(b^2*d^2*f^4 - 2*b^2
*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b*c*d*f^2*g^2 + a^2*d^
2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^2*g^4) - 1/2*B*log((b
^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(g^3*x^2 + 2*f*g^2*x + f
^2*g) - 1/2*(2*B*b*c*g^2*x - 2*B*a*d*g^2*x + A*b*d*f^2 + B*b*d*f^2 - A*b*c*
f*g + B*b*c*f*g - A*a*d*f*g - 3*B*a*d*f*g + A*a*c*g^2 + B*a*c*g^2)/(b*d*f^2
*g^3*x^2 - b*c*f*g^4*x^2 - a*d*f*g^4*x^2 + a*c*g^5*x^2 + 2*b*d*f^3*g^2*x -
2*b*c*f^2*g^3*x - 2*a*d*f^2*g^3*x + 2*a*c*f*g^4*x + b*d*f^4*g - b*c*f^3*g^2
 - a*d*f^3*g^2 + a*c*f^2*g^3)
```

maple [B] time = 0.19, size = 1554, normalized size = 8.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)/(g*x+f)^3,x)
```

```
[Out] -d^2*A/(c*g-d*f)^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)-1/2*d^2*A*g/(c*g-d*f)^2/
(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2-d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2/(a*
g-b*f)/(d*x+c)^2*B*a+d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2/(a*g-b*f)/(d*x+c)^
2*B*b*c-1/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2*b^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^
2)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c*g+d/(1/(d*x+c)*c*g
-1/(d*x+c)*d*f-g)^2*b^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)*ln((1/(d*x+c)
*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f+d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2*g/(a
*c*g^2-a*d*f*g-b*c*f*g+b*d*f^2)/(d*x+c)*B*a-d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-
g)^2*g/(a*c*g^2-a*d*f*g-b*c*f*g+b*d*f^2)/(d*x+c)*B*b*c-1/2*d^2/(1/(d*x+c)*c
*g-1/(d*x+c)*d*f-g)^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*ln((1/(d*x+c)
*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a^2*g+d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2*
B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^
2/d^2*e)*a*b*f+1/2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2*B/(a^2*g^2-2*a*b*f*g+b
^2*f^2)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*b^2*c^2*g-d/(
1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*ln
((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*b^2*c*f+1/2/(1/(d*x+c)*c*g-1/(d*x
+c)*d*f-g)^2*b^2*g*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)*ln((1/(d*x+c)*a*d-1/(d*x+c
)*b*c+b)^2/d^2*e)+d^2*B/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*
c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g
+b^2*d^2*f^4)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*a^2*g-2*d^2*B/(a^2*c^2*g^4-
2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2
*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)*ln(1/(d*x+c)*c*g-1/(d*x
+c)*d*f-g)*a*b*f-B/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f
*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*
d^2*f^4)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*b^2*c^2*g+2*d*B/(a^2*c^2*g^4-2*a
^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^
3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)*ln(1/(d*x+c)*c*g-1/(d*x+c)
*d*f-g)*b^2*c*f
```

maxima [**B**] time = 1.05, size = 405, normalized size = 2.31

$$\frac{1}{2}\left(\frac{2\,b^2\log\left(bx+a\right)}{b^2f^2g-2\,abfg^2+a^2g^3}-\frac{2\,d^2\log\left(dx+c\right)}{d^2f^2g-2\,cdfg^2+c^2g^3}+\frac{2\,\bigl(2\,\bigl(b^2cd-abd^2\bigr)f-\bigl(b^2c^2-a^2d^2\bigr)g}{b^2d^2f^4+a^2c^2g^4-2\,\bigl(b^2cd+abd^2\bigr)f^3g+\bigl(b^2c^2+4\,abcd+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - 2*d^2*log(d*x
 + c)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + 2*(2*(b^2*c*d - a*b*d^2)*f - (b
^2*c^2 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d +
 a*b*d^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^
2*c*d)*f*g^3) - 2*(b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b
*d*f^2*g + a*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d
*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
+ c^2))/(g^3*x^2 + 2*f*g^2*x + f^2*g))*B - 1/2*A/(g^3*x^2 + 2*f*g^2*x + f^2
*g)
```

mupad [**B**] time = 7.45, size = 412, normalized size = 2.35

$$\frac{\ln\left(f+g\,x\right)\,\left(g\,\left(B\,a^2\,d^2-B\,b^2\,c^2\right)-2\,B\,a\,b\,d^2\,f+2\,B\,b^2\,c\,d\,f\right)}{a^2\,c^2\,g^4-2\,a^2\,c\,d\,f\,g^3+a^2\,d^2\,f^2\,g^2-2\,a\,b\,c^2\,f\,g^3+4\,a\,b\,c\,d\,f^2\,g^2-2\,a\,b\,d^2\,f^3\,g+b^2\,c^2\,f^2\,g^2-2\,b^2\,c\,d\,f^3\,g+b^2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(f + g*x)^3,x)
```

```
[Out] (log(f + g*x)*(g*(B*a^2*d^2 - B*b^2*c^2) - 2*B*a*b*d^2*f + 2*B*b^2*c*d*f))/
(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*g^2 - 2*a*b*c^2*
f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g + 4*a*b*c*d*f^2
*g^2) - ((A*a*c*g^2 + A*b*d*f^2 - A*a*d*f*g - A*b*c*f*g - 2*B*a*d*f*g + 2*B
*b*c*f*g)/(2*(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g)) - (x*(B*a*d*g^2 - B*b
*c*g^2))/(a*c*g^2 + b*d*f^2 - a*d*f*g - b*c*f*g))/(f^2*g + g^3*x^2 + 2*f*g^
2*x) + (B*b^2*log(a + b*x))/(a^2*g^3 + b^2*f^2*g - 2*a*b*f*g^2) - (B*d^2*lo
g(c + d*x))/(c^2*g^3 + d^2*f^2*g - 2*c*d*f*g^2) - (B*log((e*(a + b*x)^2)/(c
 + d*x)^2))/(2*g*(f^2 + g^2*x^2 + 2*f*g*x))
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**3,x)
```

```
[Out] Timed out
```

3.270 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^4}\,dx$

Optimal. Leaf size=277

$$\frac{2B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3g(f+gx)^3}+$$

```
[Out] -1/3*B*(-a*d+b*c)/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)^2-2/3*B*(-a*d+b*c)*(-a*d*g-
b*c*g+2*b*d*f)/(-a*g+b*f)^2/(-c*g+d*f)^2/(g*x+f)+2/3*b^3*B*ln(b*x+a)/g/(-a*
g+b*f)^3+1/3*(-A-B*ln(e*(b*x+a)^2/(d*x+c)^2))/g/(g*x+f)^3-2/3*B*d^3*ln(d*x+
c)/g/(-c*g+d*f)^3+2/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c
^2*g^2-3*c*d*f*g+3*d^2*f^2))*ln(g*x+f)/(-a*g+b*f)^3/(-c*g+d*f)^3
```

Rubi [A] time = 0.33, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2525, 12, 72}

$$\frac{2B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3g(f+gx)^3}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^4,x]
```

```
[Out] -(B*(b*c - a*d))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (2*B*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*
b^3*B*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])/(3*g*(f + g*x)^3) - (2*B*d^3*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (2
*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*
d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^4}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3g(f+gx)^3}+\frac{B\int\frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3g(f+gx)^3}+\frac{(2B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3g(f+gx)^3}+\frac{(2B(bc-ad))\int\left(\frac{b^4}{(bc-ad)(bf-ag)^3(a+bx)}+\frac{d^4}{(bc-ad)(-df+cg)^3(c+dx)}+\right.}{}$$

$$= -\frac{B(bc-ad)}{3(bf-ag)(df-cg)(f+gx)^2}-\frac{2B(bc-ad)(2bdf-bcg-adg)}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{2b^3B\log(a+bx}{3g(bf-ag)^3}$$

Mathematica [A] time = 0.74, size = 263, normalized size = 0.95

$$\frac{2B(bc-ad)\left(\frac{g\log(f+gx)\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(bf-ag)^3(df-cg)^3}+\frac{b^3\log(a+bx)}{(bc-ad)(bf-ag)^3}+\frac{d^3\log(c+dx)}{(bc-ad)(cg-df)^3}+\frac{g(adg+bcg-2bdf)}{(f+gx)(bf-ag)^2(df-cg)}\right.}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^4,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^3) + 2*B*(b*c - a*d)*
(-1/2*g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (g*(-2*b*d*f + b*c*g + a*d*
g))/((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*Log[a + b*x])/((b*c - a*
d)*(b*f - a*g)^3) + (d^3*Log[c + d*x])/((b*c - a*d)*(-(d*f) + c*g)^3) + (g*
(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^
2))*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(3*g)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [B] time = 3.67, size = 1391, normalized size = 5.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] 2/3*B*b^4*log(abs(b*x + a))/(b^4*f^3*g - 3*a*b^3*f^2*g^2 + 3*a^2*b^2*f*g^3
- a^3*b*g^4) - 2/3*B*d^4*log(abs(d*x + c))/(d^4*f^3*g - 3*c*d^3*f^2*g^2 + 3
*c^2*d^2*f*g^3 - c^3*d*g^4) + 2/3*(3*B*b^3*c*d^2*f^2 - 3*B*a*b^2*d^3*f^2 -
3*B*b^3*c^2*d*f*g + 3*B*a^2*b*d^3*f*g + B*b^3*c^3*g^2 - B*a^3*d^3*g^2)*log(
g*x + f)/(b^3*d^3*f^6 - 3*b^3*c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d
*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 + 3*a^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 -
9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c
^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2*g^4 + 3*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^
5 - 3*a^3*c^2*d*f*g^5 + a^3*c^3*g^6) - 1/3*B*log((b^2*x^2 + 2*a*b*x + a^2)/
```

```
(d^2*x^2 + 2*c*d*x + c^2))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) -
1/3*(4*B*b^2*c*d*f*g^3*x^2 - 4*B*a*b*d^2*f*g^3*x^2 - 2*B*b^2*c^2*g^4*x^2 +
2*B*a^2*d^2*g^4*x^2 + 9*B*b^2*c*d*f^2*g^2*x - 9*B*a*b*d^2*f^2*g^2*x - 5*B*b
^2*c^2*f*g^3*x + 5*B*a^2*d^2*f*g^3*x + B*a*b*c^2*g^4*x - B*a^2*c*d*g^4*x +
A*b^2*d^2*f^4 + B*b^2*d^2*f^4 - 2*A*b^2*c*d*f^3*g + 3*B*b^2*c*d*f^3*g - 2*A
*a*b*d^2*f^3*g - 7*B*a*b*d^2*f^3*g + A*b^2*c^2*f^2*g^2 - 2*B*b^2*c^2*f^2*g^
2 + 4*A*a*b*c*d*f^2*g^2 + 4*B*a*b*c*d*f^2*g^2 + A*a^2*d^2*f^2*g^2 + 4*B*a^2
*d^2*f^2*g^2 - 2*A*a*b*c^2*f*g^3 - B*a*b*c^2*f*g^3 - 2*A*a^2*c*d*f*g^3 - 3*
B*a^2*c*d*f*g^3 + A*a^2*c^2*g^4 + B*a^2*c^2*g^4)/(b^2*d^2*f^4*g^4*x^3 - 2*b
^2*c*d*f^3*g^5*x^3 - 2*a*b*d^2*f^3*g^5*x^3 + b^2*c^2*f^2*g^6*x^3 + 4*a*b*c*
d*f^2*g^6*x^3 + a^2*d^2*f^2*g^6*x^3 - 2*a*b*c^2*f*g^7*x^3 - 2*a^2*c*d*f*g^7
*x^3 + a^2*c^2*g^8*x^3 + 3*b^2*d^2*f^5*g^3*x^2 - 6*b^2*c*d*f^4*g^4*x^2 - 6*
a*b*d^2*f^4*g^4*x^2 + 3*b^2*c^2*f^3*g^5*x^2 + 12*a*b*c*d*f^3*g^5*x^2 + 3*a^
2*d^2*f^3*g^5*x^2 - 6*a*b*c^2*f^2*g^6*x^2 - 6*a^2*c*d*f^2*g^6*x^2 + 3*a^2*c
^2*f*g^7*x^2 + 3*b^2*d^2*f^6*g^2*x - 6*b^2*c*d*f^5*g^3*x - 6*a*b*d^2*f^5*g^
3*x + 3*b^2*c^2*f^4*g^4*x + 12*a*b*c*d*f^4*g^4*x + 3*a^2*d^2*f^4*g^4*x - 6*
a*b*c^2*f^3*g^5*x - 6*a^2*c*d*f^3*g^5*x + 3*a^2*c^2*f^2*g^6*x + b^2*d^2*f^7
*g - 2*b^2*c*d*f^6*g^2 - 2*a*b*d^2*f^6*g^2 + b^2*c^2*f^5*g^3 + 4*a*b*c*d*f^
5*g^3 + a^2*d^2*f^5*g^3 - 2*a*b*c^2*f^4*g^4 - 2*a^2*c*d*f^4*g^4 + a^2*c^2*f
^3*g^5)
```

maple [B] time = 0.30, size = 4421, normalized size = 15.96

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)/(g*x+f)^4,x)
```

```
[Out] 1/3*d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(c*g-d*f)*g^2/(a^2*g^2-2*a*b*f*g+
b^2*f^2)/(d*x+c)^2*B*a*b*c+d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*B/(a^3*g^3-3
*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln((1/(d*x+c)*a*d-1/(d*x+c)*b
*c+b)^2/d^2*e)*b^3*c^2*f*g-2*d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*b^3*B/(a^3
*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*
x+c)*b*c+b)^2/d^2*e)*c*f*g-d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*B/(a^3*g^3
-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln((1/(d*x+c)*a*d-1/(d*x+c)
*b*c+b)^2/d^2*e)*a^2*b*f*g+3*d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(c*g-d*f
)*g/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*a*b*f-3*d^2/(1/(d*x+c)*c*g-1/(d
*x+c)*d*f-g)^3/(c*g-d*f)*g/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*b^2*c*f-
1/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*b^3*g^2*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^
2*f^2*g-b^3*f^3)/(d*x+c)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c-5/3*
d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^3
*B*a*b*f+5/3*d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(a^2*g^2-2*a*b*f*g+b^2*f
^2)/(d*x+c)^3*B*b^2*c*f-2/3*d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*g^3/(a^2*c^
2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a
*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*b^2*c^2
-2/3*d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(a^2*g^2-2*a*b*f*g+b^2*f^2)*g/(d*x
+c)^3*B*b^2*c^2-5/3*d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(c*g-d*f)*g^2/(a^
2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*a^2+1/3*d^3*A*g^2/(c*g-d*f)^3/(1/(d*x+
c)*c*g-1/(d*x+c)*d*f-g)^3+d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*b^3*B/(a^3*
g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^2*ln((1/(d*x+c)*a*d-1/(d*x
+c)*b*c+b)^2/d^2*e)*f^2-2*d*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^
2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2
*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*
b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b
^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*b^3*c^2*f*g+2
*d^3*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3
*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^
4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b
^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*
f^6)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*a^2*b*f*g+1/3*d^3/(1/(d*x+c)*c*g-1/(
```

```
d*x+c)*d*f-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*l
n((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a^3*g^2-1/3/(1/(d*x+c)*c*g-1/(d*
x+c)*d*f-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln(
(1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*b^3*c^3*g^2+1/(1/(d*x+c)*c*g-1/(d*
x+c)*d*f-g)^3*b^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^2
*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*c^2*g^2+d^3*A/(c*g-d*f)^3/(1/(
d*x+c)*c*g-1/(d*x+c)*d*f-g)-1/3*d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3/(a^2*
g^2-2*a*b*f*g+b^2*f^2)*g/(d*x+c)^3*B*a*b*c+d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f
-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln((1/(d*x+
c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*a*b^2*f^2+d/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g
)^3*b^3*g*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)*ln((1/(d*
x+c)*a*d-1/(d*x+c)*b*c+b)^2/d^2*e)*f-d^2/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*
B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln((1/(d*x+c)*a*d
-1/(d*x+c)*b*c+b)^2/d^2*e)*b^3*c*f^2+d^3*A*g/(c*g-d*f)^3/(1/(d*x+c)*c*g-1/(
d*x+c)*d*f-g)^2-4/3*d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*g^2/(a^2*c^2*g^4-
2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2
*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*a*b*f+4/3*d^2
/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*g^2/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2
*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-
2*b^2*c*d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*b^2*c*f+4/3*d/(1/(d*x+c)*c*g-1/(d*x+
c)*d*f-g)^3/(c*g-d*f)*g^2/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*b^2*c^2-2
/3*d^3*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3
-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*
f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a
*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^
3*f^6)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*a^3*g^2+2/3*B/(a^3*c^3*g^6-3*a^3*c
^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^
2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9
*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^
3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-1/(d*
x+c)*d*f-g)*b^3*c^3*g^2+1/3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*b^3*g^2*B/(a^
3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)*ln((1/(d*x+c)*a*d-1/(d*x+c)*b*c+
b)^2/d^2*e)+2/3*d^3/(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)^3*g^3/(a^2*c^2*g^4-2*a^
2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3
*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*a^2+d^3/(1/(d*x+c
)*c*g-1/(d*x+c)*d*f-g)^3/(a^2*g^2-2*a*b*f*g+b^2*f^2)*g/(d*x+c)^3*B*a^2-2*d^
3*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3*a^
2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^4*g
^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b^2*
d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*f^6
)*ln(1/(d*x+c)*c*g-1/(d*x+c)*d*f-g)*a*b^2*f^2+2*d^2*B/(a^3*c^3*g^6-3*a^3*c^
2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2
*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*
a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3
+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-1/(d*x
+c)*d*f-g)*b^3*c*f^2
```

maxima [B] time = 1.73, size = 900, normalized size = 3.25

$$\frac{1}{3}\left(\frac{2\,b^3\log\left(bx+a\right)}{b^3f^3g-3\,ab^2f^2g^2+3\,a^2bfg^3-a^3g^4}-\frac{2\,d^3\log\left(dx+c\right)}{d^3f^3g-3\,cd^2f^2g^2+3\,c^2dfg^3-c^3g^4}+\frac{}{b^3d^3f^6+a^3c^3g^6-3\left(b^3cd^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
```

```
(b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*
x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x +
 c^2))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*B - 1/3*A/(g^4*x^3 +
3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

mupad [**B**] time = 11.58, size = 1147, normalized size = 4.14

$$\frac{\ln\left(f+g\,x\right)\,\left(g\,\left(6\,B\,a^2\,b\,d^3\,f-6\,B\right.\right.}{3\,a^3\,c^3\,g^6-9\,a^3\,c^2\,d\,f\,g^5+9\,a^3\,c\,d^2\,f^2\,g^4-3\,a^3\,d^3\,f^3\,g^3-9\,a^2\,b\,c^3\,f\,g^5+27\,a^2\,b\,c^2\,d\,f^2\,g^4-27\,a^2\,b\,c\,d^2\,f^3\,g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(f + g*x)^4,x)
```

```
[Out] (log(f + g*x)*(g*(6*B*a^2*b*d^3*f - 6*B*b^3*c^2*d*f) - g^2*(2*B*a^3*d^3 - 2
*B*b^3*c^3) - 6*B*a*b^2*d^3*f^2 + 6*B*b^3*c*d^2*f^2))/(3*a^3*c^3*g^6 + 3*b^
3*d^3*f^6 - 3*a^3*d^3*f^3*g^3 - 3*b^3*c^3*f^3*g^3 - 9*a^2*b*c^3*f*g^5 - 9*a
*b^2*d^3*f^5*g - 9*a^3*c^2*d*f*g^5 - 9*b^3*c*d^2*f^5*g + 9*a*b^2*c^3*f^2*g^
4 + 9*a^2*b*d^3*f^4*g^2 + 9*a^3*c*d^2*f^2*g^4 + 9*b^3*c^2*d*f^4*g^2 + 27*a*
b^2*c*d^2*f^4*g^2 - 27*a*b^2*c^2*d*f^3*g^3 - 27*a^2*b*c*d^2*f^3*g^3 + 27*a^
2*b*c^2*d*f^2*g^4) - ((A*a^2*c^2*g^4 + A*b^2*d^2*f^4 + A*a^2*d^2*f^2*g^2 +
A*b^2*c^2*f^2*g^2 + 3*B*a^2*d^2*f^2*g^2 - 3*B*b^2*c^2*f^2*g^2 - 2*A*a*b*c^2
*f*g^3 - 2*A*a*b*d^2*f^3*g + B*a*b*c^2*f*g^3 - 2*A*a^2*c*d*f*g^3 - 5*B*a*b*
d^2*f^3*g - 2*A*b^2*c*d*f^3*g - B*a^2*c*d*f*g^3 + 5*B*b^2*c*d*f^3*g + 4*A*a
*b*c*d*f^2*g^2)/(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*
g^2 - 2*a*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g
 + 4*a*b*c*d*f^2*g^2) + (2*x^2*(B*a^2*d^2*g^4 - B*b^2*c^2*g^4 - 2*B*a*b*d^2
*f*g^3 + 2*B*b^2*c*d*f*g^3))/(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 +
 b^2*c^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*
b^2*c*d*f^3*g + 4*a*b*c*d*f^2*g^2) + (x*(5*B*a^2*d^2*f*g^3 - 5*B*b^2*c^2*f*
g^3 + B*a*b*c^2*g^4 - B*a^2*c*d*g^4 - 9*B*a*b*d^2*f^2*g^2 + 9*B*b^2*c*d*f^2
*g^2))/(a^2*c^2*g^4 + b^2*d^2*f^4 + a^2*d^2*f^2*g^2 + b^2*c^2*f^2*g^2 - 2*a
*b*c^2*f*g^3 - 2*a*b*d^2*f^3*g - 2*a^2*c*d*f*g^3 - 2*b^2*c*d*f^3*g + 4*a*b*
c*d*f^2*g^2))/(3*f^3*g + 3*g^4*x^3 + 9*f^2*g^2*x + 9*f*g^3*x^2) - (B*log((e
*(a + b*x)^2)/(c + d*x)^2))/(3*g*(f^3 + g^3*x^3 + 3*f^2*g*x + 3*f*g^2*x^2))
 - (2*B*b^3*log(a + b*x))/(3*a^3*g^4 - 3*b^3*f^3*g + 9*a*b^2*f^2*g^2 - 9*a^
2*b*f*g^3) + (2*B*d^3*log(c + d*x))/(3*c^3*g^4 - 3*d^3*f^3*g + 9*c*d^2*f^2*
g^2 - 9*c^2*d*f*g^3)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**4,x)
```

```
[Out] Timed out
```

3.271 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^5}\,dx$

Optimal. Leaf size=381

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{2(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf}{2(bf}$$

```
[Out] -1/6*B*(-a*d+b*c)/(-a*g+b*f)/(-c*g+d*f)/(g*x+f)^3-1/4*B*(-a*d+b*c)*(-a*d*g-
b*c*g+2*b*d*f)/(-a*g+b*f)^2/(-c*g+d*f)^2/(g*x+f)^2-1/2*B*(-a*d+b*c)*(a^2*d^
2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))/(-a*g+b*f)^3/
(-c*g+d*f)^3/(g*x+f)+1/2*b^4*B*ln(b*x+a)/g/(-a*g+b*f)^4+1/4*(-A-B*ln(e*(b*x
+a)^2/(d*x+c)^2))/g/(g*x+f)^4-1/2*B*d^4*ln(d*x+c)/g/(-c*g+d*f)^4-1/2*B*(-a*
d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d
*f*g+2*d^2*f^2))*ln(g*x+f)/(-a*g+b*f)^4/(-c*g+d*f)^4
```

Rubi [A] time = 0.55, antiderivative size = 381, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {2525, 12, 72}

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{2(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf}{2(bf}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^5,x]
```

```
[Out] -(B*(b*c - a*d))/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g))/(4*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*
(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f
*g + c^2*g^2)))/(2*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*Log[a +
b*x])/(2*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(4*g*(
f + g*x)^4) - (B*d^4*Log[c + d*x])/(2*g*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*
b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*
d*f*g + c^2*g^2))*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4g(f+gx)^4}+\frac{B\int\frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4g(f+gx)^4}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4g(f+gx)^4}+\frac{(B(bc-ad))\int\left(\frac{b^5}{(bc-ad)(bf-ag)^4(a+bx)}-\frac{d^5}{(bc-ad)(-df+cg)^4(c+dx)}\right.}{}$$

$$= -\frac{B(bc-ad)}{6(bf-ag)(df-cg)(f+gx)^3}-\frac{B(bc-ad)(2bdf-bcg-adg)}{4(bf-ag)^2(df-cg)^2(f+gx)^2}-\frac{B(bc-ad)\left(\right.}{}$$

Mathematica [**A**] time = 0.97, size = 358, normalized size = 0.94

$$\frac{2B(bc-ad)\left(-\frac{g\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(f+gx)(bf-ag)^3(df-cg)^3}-\frac{g\log(f+gx)(adg+bcg-2bdf)\left(a^2d^2g^2-2abd^2fg+b^2\left(c^2g^2-2cdfg+2d^2f^2\right)\right.}{(bf-ag)^4(df-cg)^4}\right.}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^5,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^4) + 2*B*(b*c - a*d)*
(-1/3*g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^3) + (g*(-2*b*d*f + b*c*g + a*d*
g))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 + a*b*d*g
*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)))/((b*f - a*g)^3*(d
*f - c*g)^3*(f + g*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^4) - (
d^4*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^4) - (g*(-2*b*d*f + b*c*g + a*d*
g)*(-2*a*b*d^2*f*g + a^2*d^2*g^2 + b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*L
og[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4)))/(4*g)
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Undef
/Unsigned Inf encountered in limitUndef/Unsigned Inf encountered in limit(-
1/4*A*g^3-1/4*B*g^3)*(-(g*x+f)^-1/g)^4+(-B*a*d*g^3+B*b*c*g^3)/(6*a*c*g^2-6*
a*d*f*g-6*b*c*f*g+6*b*d*f^2)*(-(g*x+f)^-1/g)^3+(-B*a^2*d^2*g^3+2*B*a*b*d^2*
f*g^2+B*b^2*c^2*g^3-2*B*b^2*c*d*f*g^2)/(4*a^2*c^2*g^4-8*a^2*c*d*f*g^3+4*a^2
*d^2*f^2*g^2-8*a*b*c^2*f*g^3+16*a*b*c*d*f^2*g^2-8*a*b*d^2*f^3*g+4*b^2*c^2*f
^2*g^2-8*b^2*c*d*f^3*g+4*b^2*d^2*f^4)*(-(g*x+f)^-1/g)^2-(-B*a^3*d^3*g^3+3*B
```

```
*a^2*b*d^3*f*g^2-3*B*a*b^2*d^3*f^2*g+B*b^3*c^3*g^3-3*B*b^3*c^2*d*f*g^2+3*B*
b^3*c*d^2*f^2*g)/(2*a^3*c^3*g^6-6*a^3*c^2*d*f*g^5+6*a^3*c*d^2*f^2*g^4-2*a^3
*d^3*f^3*g^3-6*a^2*b*c^3*f*g^5+18*a^2*b*c^2*d*f^2*g^4-18*a^2*b*c*d^2*f^3*g^
3+6*a^2*b*d^3*f^4*g^2+6*a*b^2*c^3*f^2*g^4-18*a*b^2*c^2*d*f^3*g^3+18*a*b^2*c
*d^2*f^4*g^2-6*a*b^2*d^3*f^5*g-2*b^3*c^3*f^3*g^3+6*b^3*c^2*d*f^4*g^2-6*b^3*
c*d^2*f^5*g+2*b^3*d^3*f^6)*(g*x+f)^-1/g-1/4*B*g^3*(-(g*x+f)^-1/g)^4*ln((a^2
*g^4*(-(g*x+f)^-1/g)^2-2*a*b*f*g^3*(-(g*x+f)^-1/g)^2+2*a*b*g^2*(g*x+f)^-1/g
+b^2*f^2*g^2*(-(g*x+f)^-1/g)^2-2*b^2*f*g*(g*x+f)^-1/g+b^2)/(c^2*g^4*(-(g*x+
f)^-1/g)^2-2*c*d*f*g^3*(-(g*x+f)^-1/g)^2+2*c*d*g^2*(g*x+f)^-1/g+d^2*f^2*g^2
*(-(g*x+f)^-1/g)^2-2*d^2*f*g*(g*x+f)^-1/g+d^2))+g/g*((-B*a^4*d^4*g^3+4*B*a^
3*d^4*g^2*b*f-6*B*a^2*d^4*g*b^2*f^2+4*B*a*d^4*b^3*f^3-4*B*d^3*b^4*c*f^3+6*B
*d^2*g*b^4*c^2*f^2-4*B*d*g^2*b^4*c^3*f+B*g^3*b^4*c^4)/(4*a^4*d^4*g^4*f^4-16
*a^4*d^3*g^5*c*f^3+24*a^4*d^2*g^6*c^2*f^2-16*a^4*d*g^7*c^3*f+4*a^4*g^8*c^4-
16*a^3*d^4*g^3*b*f^5+64*a^3*d^3*g^4*b*c*f^4-96*a^3*d^2*g^5*b*c^2*f^3+64*a^3
*d*g^6*b*c^3*f^2-16*a^3*g^7*b*c^4*f+24*a^2*d^4*g^2*b^2*f^6-96*a^2*d^3*g^3*b
^2*c*f^5+144*a^2*d^2*g^4*b^2*c^2*f^4-96*a^2*d*g^5*b^2*c^3*f^3+24*a^2*g^6*b^
2*c^4*f^2-16*a*d^4*g*b^3*f^7+64*a*d^3*g^2*b^3*c*f^6-96*a*d^2*g^3*b^3*c^2*f^
5+64*a*d*g^4*b^3*c^3*f^4-16*a*g^5*b^3*c^4*f^3+4*d^4*b^4*f^8-16*d^3*g*b^4*c*
f^7+24*d^2*g^2*b^4*c^2*f^6-16*d*g^3*b^4*c^3*f^5+4*g^4*b^4*c^4*f^4)*ln(abs(-
(-(g*x+f)^-1/g)^2*a*d*g^3*f+(-(g*x+f)^-1/g)^2*a*g^4*c+(-(g*x+f)^-1/g)^2*d*g
^2*b*f^2-(-(g*x+f)^-1/g)^2*g^3*b*c*f+(g*x+f)^-1/g*a*d*g^2-2*(g*x+f)^-1/g*d*
g*b*f+(g*x+f)^-1/g*g^2*b*c+d*b))+(-B*a^5*d^5*g^5+4*B*a^4*d^5*g^4*b*f+B*a^4*
d^4*g^5*b*c-6*B*a^3*d^5*g^3*b^2*f^2-4*B*a^3*d^4*g^4*b^2*c*f+4*B*a^2*d^5*g^2
*b^3*f^3+6*B*a^2*d^4*g^3*b^3*c*f^2-2*B*a*d^5*g*b^4*f^4-6*B*a*d^3*g^3*b^4*c^
2*f^2+4*B*a*d^2*g^4*b^4*c^3*f-B*a*d*g^5*b^4*c^4+2*B*d^4*g*b^5*c*f^4-4*B*d^3
*g^2*b^5*c^2*f^3+6*B*d^2*g^3*b^5*c^3*f^2-4*B*d*g^4*b^5*c^4*f+B*g^5*b^5*c^5)
/(4*a^4*d^4*g^4*f^4-16*a^4*d^3*g^5*c*f^3+24*a^4*d^2*g^6*c^2*f^2-16*a^4*d*g^
7*c^3*f+4*a^4*g^8*c^4-16*a^3*d^4*g^3*b*f^5+64*a^3*d^3*g^4*b*c*f^4-96*a^3*d^
2*g^5*b*c^2*f^3+64*a^3*d*g^6*b*c^3*f^2-16*a^3*g^7*b*c^4*f+24*a^2*d^4*g^2*b^
2*f^6-96*a^2*d^3*g^3*b^2*c*f^5+144*a^2*d^2*g^4*b^2*c^2*f^4-96*a^2*d*g^5*b^2
*c^3*f^3+24*a^2*g^6*b^2*c^4*f^2-16*a*d^4*g*b^3*f^7+64*a*d^3*g^2*b^3*c*f^6-9
6*a*d^2*g^3*b^3*c^2*f^5+64*a*d*g^4*b^3*c^3*f^4-16*a*g^5*b^3*c^4*f^3+4*d^4*b
^4*f^8-16*d^3*g*b^4*c*f^7+24*d^2*g^2*b^4*c^2*f^6-16*d*g^3*b^4*c^3*f^5+4*g^4
*b^4*c^4*f^4)/abs(a*d*g^2-g^2*b*c)*ln(abs(2*(g*x+f)^-1/g*a*d*g^3*f-2*(g*x+f
)^-1/g*a*g^4*c-2*(g*x+f)^-1/g*d*g^2*b*f^2+2*(g*x+f)^-1/g*g^3*b*c*f-a*d*g^2+
2*d*g*b*f-g^2*b*c-abs(a*d*g^2-g^2*b*c))/abs(2*(g*x+f)^-1/g*a*d*g^3*f-2*(g*x
+f)^-1/g*a*g^4*c-2*(g*x+f)^-1/g*d*g^2*b*f^2+2*(g*x+f)^-1/g*g^3*b*c*f-a*d*g^
2+2*d*g*b*f-g^2*b*c+abs(a*d*g^2-g^2*b*c))))
```

maple [B] time = 0.45, size = 10401, normalized size = 27.30

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)/(g*x+f)^5,x)
```

```
[Out] result too large to display
```

maxima [B] time = 2.00, size = 1809, normalized size = 4.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/12*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
```

```
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 3*log(b^2*e*x^2/(d^2*x^2 +
 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*
c*d*x + c^2))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
)*B - 1/4*A/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

mupad [B] time = 17.43, size = 2520, normalized size = 6.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))/(f + g*x)^5,x)
```

```
[Out] (log(f + g*x)*(g*(6*B*a^2*b^2*d^4*f^2 - 6*B*b^4*c^2*d^2*f^2) - g^2*(4*B*a^3
*b*d^4*f - 4*B*b^4*c^3*d*f) + g^3*(B*a^4*d^4 - B*b^4*c^4) - 4*B*a*b^3*d^4*f
^3 + 4*B*b^4*c*d^3*f^3))/(2*a^4*c^4*g^8 + 2*b^4*d^4*f^8 + 2*a^4*d^4*f^4*g^4
 + 2*b^4*c^4*f^4*g^4 + 12*a^2*b^2*c^4*f^2*g^6 + 12*a^2*b^2*d^4*f^6*g^2 + 12
*a^4*c^2*d^2*f^2*g^6 + 12*b^4*c^2*d^2*f^6*g^2 - 8*a^3*b*c^4*f*g^7 - 8*a*b^3
*d^4*f^7*g - 8*a^4*c^3*d*f*g^7 - 8*b^4*c*d^3*f^7*g - 8*a*b^3*c^4*f^3*g^5 -
8*a^3*b*d^4*f^5*g^3 - 8*a^4*c*d^3*f^3*g^5 - 8*b^4*c^3*d*f^5*g^3 + 32*a*b^3*
c*d^3*f^6*g^2 + 32*a*b^3*c^3*d*f^4*g^4 + 32*a^3*b*c*d^3*f^4*g^4 + 32*a^3*b*
c^3*d*f^2*g^6 - 48*a*b^3*c^2*d^2*f^5*g^3 - 48*a^2*b^2*c*d^3*f^5*g^3 - 48*a^
2*b^2*c^3*d*f^3*g^5 - 48*a^3*b*c^2*d^2*f^3*g^5 + 72*a^2*b^2*c^2*d^2*f^4*g^4
) - ((3*A*a^3*c^3*g^6 + 3*A*b^3*d^3*f^6 - 3*A*a^3*d^3*f^3*g^3 - 3*A*b^3*c^3
*f^3*g^3 - 11*B*a^3*d^3*f^3*g^3 + 11*B*b^3*c^3*f^3*g^3 + 9*A*a*b^2*c^3*f^2*
g^4 + 9*A*a^2*b*d^3*f^4*g^2 - 7*B*a*b^2*c^3*f^2*g^4 + 9*A*a^3*c*d^2*f^2*g^4
 + 31*B*a^2*b*d^3*f^4*g^2 + 9*A*b^3*c^2*d*f^4*g^2 + 7*B*a^3*c*d^2*f^2*g^4 -
 31*B*b^3*c^2*d*f^4*g^2 - 9*A*a^2*b*c^3*f*g^5 - 9*A*a*b^2*d^3*f^5*g + 2*B*a
^2*b*c^3*f*g^5 - 9*A*a^3*c^2*d*f*g^5 - 26*B*a*b^2*d^3*f^5*g - 9*A*b^3*c*d^2
*f^5*g - 2*B*a^3*c^2*d*f*g^5 + 26*B*b^3*c*d^2*f^5*g + 27*A*a*b^2*c*d^2*f^4*
g^2 - 27*A*a*b^2*c^2*d*f^3*g^3 - 27*A*a^2*b*c*d^2*f^3*g^3 + 27*A*a^2*b*c^2*
d*f^2*g^4 + 15*B*a*b^2*c^2*d*f^3*g^3 - 15*B*a^2*b*c*d^2*f^3*g^3)/(6*(a^3*c^
3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5
 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*
f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 +
```

```
 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*
a^2*b*c^2*d*f^2*g^4)) - (x^2*(B*a*b^2*c^3*g^6 - B*a^3*c*d^2*g^6 + 7*B*a^3*d
^3*f*g^5 - 7*B*b^3*c^3*f*g^5 + 20*B*a*b^2*d^3*f^3*g^3 - 21*B*a^2*b*d^3*f^2*
g^4 - 20*B*b^3*c*d^2*f^3*g^3 + 21*B*b^3*c^2*d*f^2*g^4 - 3*B*a*b^2*c^2*d*f*g
^5 + 3*B*a^2*b*c*d^2*f*g^5))/(2*(a^3*c^3*g^6 + b^3*d^3*f^6 - a^3*d^3*f^3*g^
3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5 - 3*a*b^2*d^3*f^5*g - 3*a^3*c^2*d*f
*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f^2*g^4 + 3*a^2*b*d^3*f^4*g^2 + 3*a^
3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 - 9*a*b^2*c^2
*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a^2*b*c^2*d*f^2*g^4)) + (x*(B*a^2*b*
c^3*g^6 - B*a^3*c^2*d*g^6 - 13*B*a^3*d^3*f^2*g^4 + 13*B*b^3*c^3*f^2*g^4 - 3
4*B*a*b^2*d^3*f^4*g^2 + 38*B*a^2*b*d^3*f^3*g^3 + 34*B*b^3*c*d^2*f^4*g^2 - 3
8*B*b^3*c^2*d*f^3*g^3 - 5*B*a*b^2*c^3*f*g^5 + 5*B*a^3*c*d^2*f*g^5 + 12*B*a*
b^2*c^2*d*f^2*g^4 - 12*B*a^2*b*c*d^2*f^2*g^4))/(3*(a^3*c^3*g^6 + b^3*d^3*f^
6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5 - 3*a*b^2*d^3*f^5
*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f^2*g^4 + 3*a^2*b*
d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4
*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a^2*b*c^2*d*f^2*g^
4)) - (x^3*(B*a^3*d^3*g^6 - B*b^3*c^3*g^6 + 3*B*a*b^2*d^3*f^2*g^4 - 3*B*b^3
*c*d^2*f^2*g^4 - 3*B*a^2*b*d^3*f*g^5 + 3*B*b^3*c^2*d*f*g^5))/(a^3*c^3*g^6 +
 b^3*d^3*f^6 - a^3*d^3*f^3*g^3 - b^3*c^3*f^3*g^3 - 3*a^2*b*c^3*f*g^5 - 3*a*
b^2*d^3*f^5*g - 3*a^3*c^2*d*f*g^5 - 3*b^3*c*d^2*f^5*g + 3*a*b^2*c^3*f^2*g^4
 + 3*a^2*b*d^3*f^4*g^2 + 3*a^3*c*d^2*f^2*g^4 + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^
2*c*d^2*f^4*g^2 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 + 9*a^2*b*c
^2*d*f^2*g^4))/(2*f^4*g + 2*g^5*x^4 + 8*f^3*g^2*x + 8*f*g^4*x^3 + 12*f^2*g^
3*x^2) + (B*b^4*log(a + b*x))/(2*a^4*g^5 + 2*b^4*f^4*g - 8*a*b^3*f^3*g^2 +
12*a^2*b^2*f^2*g^3 - 8*a^3*b*f*g^4) - (B*log((e*(a + b*x)^2)/(c + d*x)^2))/
(4*g*(f^4 + g^4*x^4 + 4*f^3*g*x + 4*f*g^3*x^3 + 6*f^2*g^2*x^2)) - (B*d^4*lo
g(c + d*x))/(2*c^4*g^5 + 2*d^4*f^4*g - 8*c*d^3*f^3*g^2 + 12*c^2*d^2*f^2*g^3
 - 8*c^3*d*f*g^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**5,x)
```

```
[Out] Timed out
```

3.272 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 \, dx$

Optimal. Leaf size=869

$$\frac{2B^2g^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{3b^4d^4}+\frac{2B^2g^3\log(c+dx)(bc-ad)^4}{3b^4d^4}+\frac{2B^2g^3x(bc-ad)^3}{3b^3d^3}+\frac{B^2g^2(4bdf-3bcg-adg)\log\left(\right.}{b^4d^4}$$

```
[Out] 2/3*B^2*(-a*d+b*c)^3*g^3*x/b^3/d^3+B^2*(-a*d+b*c)^2*g^2*(-a*d*g-3*b*c*g+4*b
*d*f)*x/b^3/d^3+1/3*B^2*(-a*d+b*c)^2*g^3*(d*x+c)^2/b^2/d^4-B*(-a*d+b*c)*g*(
a^2*d^2*g^2-2*a*b*d*g*(-c*g+2*d*f)+b^2*(3*c^2*g^2-8*c*d*f*g+6*d^2*f^2))*(b*
x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b^4/d^3-1/2*B*(-a*d+b*c)*g^2*(-a*d*g-3
*b*c*g+4*b*d*f)*(d*x+c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b^2/d^4-1/3*B*(-a
*d+b*c)*g^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^4-1/4*(-a*g+b*f)^
4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b^4/g+1/4*(g*x+f)^4*(A+B*ln(e*(b*x+a)^2
/(d*x+c)^2))^2/g-B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2
*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln(
(-a*d+b*c)/b/(d*x+c))/b^4/d^4+2/3*B^2*(-a*d+b*c)^4*g^3*ln((b*x+a)/(d*x+c))/
b^4/d^4+B^2*(-a*d+b*c)^3*g^2*(-a*d*g-3*b*c*g+4*b*d*f)*ln((b*x+a)/(d*x+c))/b
^4/d^4+2/3*B^2*(-a*d+b*c)^4*g^3*ln(d*x+c)/b^4/d^4+B^2*(-a*d+b*c)^3*g^2*(-a*
d*g-3*b*c*g+4*b*d*f)*ln(d*x+c)/b^4/d^4+2*B^2*(-a*d+b*c)^2*g*(a^2*d^2*g^2-2*
a*b*d*g*(-c*g+2*d*f)+b^2*(3*c^2*g^2-8*c*d*f*g+6*d^2*f^2))*ln(d*x+c)/b^4/d^4
-2*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^
2*g^2-2*c*d*f*g+2*d^2*f^2))*polylog(2,d*(b*x+a)/b/(d*x+c))/b^4/d^4
```

Rubi [A] time = 1.81, antiderivative size = 973, normalized size of antiderivative = 1.12, number of steps used = 33, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2\log^2(a+bx)(bf-ag)^4}{b^4g}-\frac{B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)(bf-ag)^4}{b^4g}-\frac{2B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)(bf-}{b^4g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*(b*c + a*d)*g^3*x)/(3*b^3*d^3) + (B^2*(b*c - a*d)^2*g
^2*(4*b*d*f - b*c*g - a*d*g)*x)/(b^3*d^3) - (A*B*(b*c - a*d)*g*(a^2*d^2*g^2
 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*x)/(b^3*d
^3) + (B^2*(b*c - a*d)^2*g^3*x^2)/(3*b^2*d^2) - (2*a^3*B^2*(b*c - a*d)*g^3*
Log[a + b*x])/(3*b^4*d) + (a^2*B^2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g
)*Log[a + b*x])/(b^4*d^2) + (B^2*(b*f - a*g)^4*Log[a + b*x]^2)/(b^4*g) - (B
^2*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*
c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b^4*d^3) -
 (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/(2*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2]))/(3*b*d) - (B*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[(e*
(a + b*x)^2)/(c + d*x)^2]))/(b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2])^2)/(4*g) + (2*B^2*c^3*(b*c - a*d)*g^3*Log[c + d*x])/(3*b*d
^4) - (B^2*c^2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(b^2
*d^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(
6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[c + d*x])/(b^4*d^4) - (2*B^2*(d*f - c
*g)^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*g) + (B*(d*f - c
*g)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(d^4*g) + (B^2
*(d*f - c*g)^4*Log[c + d*x]^2)/(d^4*g) - (2*B^2*(b*f - a*g)^4*Log[a + b*x]*
Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) - (2*B^2*(b*f - a*g)^4*PolyLog[2, -
```

```
((d*(a + b*x))/(b*c - a*d))])/(b^4*g) - (2*B^2*(d*f - c*g)^4*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/(d^4*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{B\int \frac{2(bc-ad)(f+gx)^4\Big(A+B\log\Big(\frac{e(a+bx)^2}{(c+dx)^2}}{(a+bx)(c+dx)}}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int \frac{(f+gx)^4\Big(A+B\log\Big(\frac{e(a+}{(c+}}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int\Bigg(\frac{g^2\big(a^2d^2g^2-abdg(4df}{}}{}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{\left(B(bc-ad)g^3\right)\int x^2\Big(A+B\log}{bd}$$

$$= -\frac{AB(bc-ad)g\Big(a^2d^2g^2-abdg(4df-cg)+b^2\Big(6d^2f^2-4cdfg+c^2g}{b^3d^3}$$

$$= -\frac{AB(bc-ad)g\Big(a^2d^2g^2-abdg(4df-cg)+b^2\Big(6d^2f^2-4cdfg+c^2g}{b^3d^3}$$

$$= -\frac{AB(bc-ad)g\Big(a^2d^2g^2-abdg(4df-cg)+b^2\Big(6d^2f^2-4cdfg+c^2g}{b^3d^3}$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} -$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} -$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} -$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3}+\frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} -$$

Mathematica [A] time = 1.00, size = 746, normalized size = 0.86

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{2B\Big(2Bg^4(bc-ad)\big(2a^3d^3\log(a+bx)+bdx(bc-ad)(2ad+2bc-bdx)-2b^3c^3\log(c+dx)\big)+6Abdg^2x(bc-ad)\big(a^2d}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (2*B*(6*A*b*d*(b*
c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d
*f*g + c^2*g^2))*x + 6*B*d*(b*c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f +
 c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x)^2
```

```
)/(c + d*x)^2] + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2*(A
 + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*b^3*d^3*(b*c - a*d)*g^4*x^3*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 6*d^4*(b*f - a*g)^4*Log[a + b*x]*(A
+ B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 12*B*(b*c - a*d)^2*g^2*(a^2*d^2*g^2
 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[c +
d*x] - 6*b^4*(d*f - c*g)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c +
 d*x] + 2*B*(b*c - a*d)*g^4*(b*d*(b*c - a*d)*x*(2*b*c + 2*a*d - b*d*x) + 2*
a^3*d^3*Log[a + b*x] - 2*b^3*c^3*Log[c + d*x]) - 6*B*(b*c - a*d)*g^3*(-4*b*
d*f + b*c*g + a*d*g)*(-(a^2*d^2*Log[a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c
^2*Log[c + d*x])) - 6*B*d^4*(b*f - a*g)^4*(Log[a + b*x]*(Log[a + b*x] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
) + 6*b^4*B*(d*f - c*g)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*b^4*d^4))
/(4*g)
```

fricas [F] time = 1.08, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(\frac{b^2ex^2 + 2}{d^2x^2 +}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*g^3
*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b^2*e*x^2 + 2*a*b*e*
x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2
+ 3*A*B*f^2*g*x + A*B*f^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2
*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(gx + f\right)^3 \left(B\log\left(\frac{(bx + a)^2 e}{(dx + c)^2}\right) + A\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 1.35, size = 0, normalized size = 0.00

$$\int \left(gx + f\right)^3 \left(B\ln\left(\frac{(bx + a)^2 e}{(dx + c)^2}\right) + A\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((g*x+f)^3*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [B] time = 1.96, size = 2351, normalized size = 2.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*g^3*x^4 + A^2*f*g^2*x^3 + 3/2*A^2*f^2*g*x^2 + 2*(x*log(b^2*e*x^2/(d
^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*
x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*A*B*f^3 +
3*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d
*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c
^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*A*B*f^2*g + 2*(x^3*log(b^2*e*x
^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/
(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*f*g^
2 + 1/6*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2
 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x + a)/b
^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d
 - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*g^3 + A^2*f^3*x
 - 1/3*(6*a^3*c*d^3*g^3 - 3*(8*c*d^3*f*g^2 - c^2*d^2*g^3)*a^2*b + 2*(18*c*d
^3*f^2*g - 6*c^2*d^2*f*g^2 + c^3*d*g^3)*a*b^2 + (12*c*d^3*f^3*log(e) - (3*g
^3*log(e) + 11*g^3)*c^4 + 12*(f*g^2*log(e) + 3*f*g^2)*c^3*d - 18*(f^2*g*log
(e) + 2*f^2*g)*c^2*d^2)*b^3)*B^2*log(d*x + c)/(b^3*d^4) + 2*(4*a*b^3*d^4*f^
3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3 - (4*c*d^3*f^3 -
6*c^2*d^2*f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*b^4)*(log(b*x + a)*log((b*d*x +
a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) +
1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 4*(a*b^3*d^4*g^3*log(e) + (3*d^4*f*g
^2*log(e)^2 - c*d^3*g^3*log(e))*b^4)*B^2*x^3 - 2*((3*g^3*log(e) - 2*g^3)*a^
2*b^2*d^4 - 4*(3*d^4*f*g^2*log(e) - c*d^3*g^3)*a*b^3 - (9*d^4*f^2*g*log(e)^
2 - 12*c*d^3*f*g^2*log(e) + (3*g^3*log(e) + 2*g^3)*c^2*d^2)*b^4)*B^2*x^2 +
4*((3*g^3*log(e) - 5*g^3)*a^3*b*d^4 + (5*c*d^3*g^3 - 12*(f*g^2*log(e) - f*g
^2)*d^4)*a^2*b^2 + (18*d^4*f^2*g*log(e) - 24*c*d^3*f*g^2 + 5*c^2*d^2*g^3)*a
*b^3 + (3*d^4*f^3*log(e)^2 - 18*c*d^3*f^2*g*log(e) - (3*g^3*log(e) + 5*g^3)
*c^3*d + 12*(f*g^2*log(e) + f*g^2)*c^2*d^2)*b^4)*B^2*x + 12*(B^2*b^4*d^4*g^
3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f
^3*x + (4*a*b^3*d^4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4
*g^3)*B^2)*log(b*x + a)^2 + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x
^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*c*d^3*f^3 - 6*c^2*d
^2*f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*B^2*b^4)*log(d*x + c)^2 + 4*(3*B^2*b^4*
d^4*g^3*x^4*log(e) + 2*(a*b^3*d^4*g^3 + (6*d^4*f*g^2*log(e) - c*d^3*g^3)*b^
4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (6*d^4*f^2*g*log(e) -
 4*c*d^3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4*a^2*b
^2*d^4*f*g^2 + a^3*b*d^4*g^3 + (2*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^
2*f*g^2 - c^3*d*g^3)*b^4)*B^2*x - ((3*g^3*log(e) - 11*g^3)*a^4*d^4 + 2*(c*d
^3*g^3 - 6*(f*g^2*log(e) - 3*f*g^2)*d^4)*a^3*b - 3*(4*c*d^3*f*g^2 - c^2*d^2
*g^3 - 6*(f^2*g*log(e) - 2*f^2*g)*d^4)*a^2*b^2 - 6*(2*d^4*f^3*log(e) - 6*c*
d^3*f^2*g + 4*c^2*d^2*f*g^2 - c^3*d*g^3)*a*b^3)*B^2)*log(b*x + a) - 4*(3*B^
2*b^4*d^4*g^3*x^4*log(e) + 2*(a*b^3*d^4*g^3 + (6*d^4*f*g^2*log(e) - c*d^3*g
^3)*b^4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (6*d^4*f^2*g*lo
g(e) - 4*c*d^3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4
*a^2*b^2*d^4*f*g^2 + a^3*b*d^4*g^3 + (2*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*
c^2*d^2*f*g^2 - c^3*d*g^3)*b^4)*B^2*x + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*
d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*a*b^3*d^
4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^4*d^4)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)^3\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)^2}{\left(c+d\,x\right)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.273 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx$

Optimal. Leaf size=542

$$\frac{4B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3b^3d^3}+8B^2(bc$$

```
[Out] 4/3*B^2*(-a*d+b*c)^2*g^2*x/b^2/d^2-4/3*B*(-a*d+b*c)*g*(-a*d*g-2*b*c*g+3*b*d
*f)*(b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b^3/d^2-2/3*B*(-a*d+b*c)*g^2*(d
*x+c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b/d^3-1/3*(-a*g+b*f)^3*(A+B*ln(e*(b
*x+a)^2/(d*x+c)^2))^2/b^3/g+1/3*(g*x+f)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2
/g+4/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*
g+3*d^2*f^2))*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b^3/
d^3+4/3*B^2*(-a*d+b*c)^3*g^2*ln((b*x+a)/(d*x+c))/b^3/d^3+4/3*B^2*(-a*d+b*c)
^3*g^2*ln(d*x+c)/b^3/d^3+8/3*B^2*(-a*d+b*c)^2*g*(-a*d*g-2*b*c*g+3*b*d*f)*ln
(d*x+c)/b^3/d^3+8/3*B^2*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c
^2*g^2-3*c*d*f*g+3*d^2*f^2))*polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^3
```

Rubi [A] time = 1.20, antiderivative size = 659, normalized size of antiderivative = 1.22, number of steps used = 29, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2(bf-ag)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3g}-\frac{8B^2(df-cg)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3d^3g}+\frac{4a^2B^2g^2(bc-ad)\log(a+bx)}{3b^3d}-4ABg$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (4*B^2*(b*c - a*d)^2*g^2*x)/(3*b^2*d^2) - (4*A*B*(b*c - a*d)*g*(3*b*d*f - b
*c*g - a*d*g)*x)/(3*b^2*d^2) + (4*a^2*B^2*(b*c - a*d)*g^2*Log[a + b*x])/(3*
b^3*d) + (4*B^2*(b*f - a*g)^3*Log[a + b*x]^2)/(3*b^3*g) - (4*B^2*(b*c - a*d
)*g*(3*b*d*f - b*c*g - a*d*g)*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(
3*b^3*d^2) - (2*B*(b*c - a*d)*g^2*x^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]))/(3*b*d) - (4*B*(b*f - a*g)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(
c + d*x)^2]))/(3*b^3*g) + ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2])^2)/(3*g) - (4*B^2*c^2*(b*c - a*d)*g^2*Log[c + d*x])/(3*b*d^3) + (8*B^2
*(b*c - a*d)^2*g*(3*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(3*b^3*d^3) - (8*B
^2*(d*f - c*g)^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^3*g)
+ (4*B*(d*f - c*g)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])
/(3*d^3*g) + (4*B^2*(d*f - c*g)^3*Log[c + d*x]^2)/(3*d^3*g) - (8*B^2*(b*f -
 a*g)^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*g) - (8*B^2*(b*
f - a*g)^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*g) - (8*B^2*(d*
f - c*g)^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*d^3*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{(2B)\int \frac{2(bc-ad)(f+gx)^3\left(A+B\log\left(\frac{e(a+b}{(c+d}\right.\right.}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{(4B(bc-ad))\int \frac{(f+gx)^3\left(A+B\log\left(\frac{e(}{(}\right.\right.}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{(4B(bc-ad))\int \left(\frac{g^2(3bdf-bcg-adg)\left(\right.}{b^2}\right.}{}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{\left(4B(bc-ad)g^2\right)\int x\left(A+B\log\right.}{3bd}$$

$$= -\frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{2B(bc-ad)g^2x^2\left(A+B\log\right.}{3bd}$$

$$= -\frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{4B^2(bc-ad)g(3bdf-bcg-}{3b^3}$$

$$= -\frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{4B^2(bc-ad)g(3bdf-bcg-}{3b^3}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc}{}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc}{}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc}{}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc}{}$$

Mathematica [A] time = 0.55, size = 497, normalized size = 0.92

$$(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{2B\Bigl(-2Bg^3(bc-ad)\bigl(a^2d^2\log(a+bx)-b\bigl(dx(ad-bc)+bc^2\log(c+dx)\bigr)\bigr)-2b^3(df-cg)^3\log(c+dx)\Bigl(B\log\Bigl(\frac{e(a}{(c}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (2*B*(2*A*b*d*(b*
c - a*d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + 2*B*d*(b*c - a*d)*g^2*(3*b*d*f -
 b*c*g - a*d*g)*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2] + b^2*d^2*(b*c -
 a*d)*g^3*x^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d^3*(b*f - a*g)^
3*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 4*B*(b*c - a*d)^2
*g^2*(-3*b*d*f + b*c*g + a*d*g)*Log[c + d*x] - 2*b^3*(d*f - c*g)^3*(A + B*L
og[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - 2*B*(b*c - a*d)*g^3*(a^2*d^
2*Log[a + b*x] - b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 2*B*d^3*(b*
f - a*g)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^3*B*(d*f - c*g)^3*((2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])))/(b^3*d^3))/(3*g)
```

fricas [F] time = 1.10, size = 0, normalized size = 0.00

$$\text{integral}\Bigl(A^2g^2x^2+2\,A^2fgx+A^2f^2+\left(B^2g^2x^2+2\,B^2fgx+B^2f^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(ABg^2x^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*x +
 B^2*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2
+ 2*(A*B*g^2*x^2 + 2*A*B*f*g*x + A*B*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*
e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(gx+f\right)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 1.24, size = 0, normalized size = 0.00

$$\int\left(gx+f\right)^2\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((g*x+f)^2*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [**B**] time = 1.77, size = 1458, normalized size = 2.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*g^2*x^3 + A^2*f*g*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2
) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))
+ 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*A*B*f^2 + 2*(x^2*log(b^2*e*x^2/(
d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2
*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 -
2*(b*c - a*d)*x/(b*d))*A*B*f*g + 2/3*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x
+ c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c
^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^
2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*g^2 + A^2*f^2*x + 4/3*(2*a
^2*c*d^2*g^2 - (6*c*d^2*f*g - c^2*d*g^2)*a*b - (3*c*d^2*f^2*log(e) + (g^2*l
og(e) + 3*g^2)*c^3 - 3*(f*g*log(e) + 2*f*g)*c^2*d)*b^2)*B^2*log(d*x + c)/(b
^2*d^3) + 8/3*(3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2 - (3*c*d^2*f
^2 - 3*c^2*d*f*g + c^3*g^2)*b^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d
) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/3*(B^2*b^3*d^
3*g^2*x^3*log(e)^2 + (2*a*b^2*d^3*g^2*log(e) + (3*d^3*f*g*log(e)^2 - 2*c*d^
2*g^2*log(e))*b^3)*B^2*x^2 - (4*(g^2*log(e) - g^2)*a^2*b*d^3 - 4*(3*d^3*f*g
*log(e) - 2*c*d^2*g^2)*a*b^2 - (3*d^3*f^2*log(e)^2 - 12*c*d^2*f*g*log(e) +
4*(g^2*log(e) + g^2)*c^2*d)*b^3)*B^2*x + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3
*d^3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a
^3*d^3*g^2)*B^2)*log(b*x + a)^2 + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*
g*x^2 + 3*B^2*b^3*d^3*f^2*x + (3*c*d^2*f^2 - 3*c^2*d*f*g + c^3*g^2)*B^2*b^3
)*log(d*x + c)^2 + 4*(B^2*b^3*d^3*g^2*x^3*log(e) + (a*b^2*d^3*g^2 + (3*d^3*
f*g*log(e) - c*d^2*g^2)*b^3)*B^2*x^2 + (6*a*b^2*d^3*f*g - 2*a^2*b*d^3*g^2 +
 (3*d^3*f^2*log(e) - 6*c*d^2*f*g + 2*c^2*d*g^2)*b^3)*B^2*x + ((g^2*log(e) -
 3*g^2)*a^3*d^3 + (c*d^2*g^2 - 3*(f*g*log(e) - 2*f*g)*d^3)*a^2*b + (3*d^3*f
^2*log(e) - 6*c*d^2*f*g + 2*c^2*d*g^2)*a*b^2)*B^2)*log(b*x + a) - 4*(B^2*b^
3*d^3*g^2*x^3*log(e) + (a*b^2*d^3*g^2 + (3*d^3*f*g*log(e) - c*d^2*g^2)*b^3)
*B^2*x^2 + (6*a*b^2*d^3*f*g - 2*a^2*b*d^3*g^2 + (3*d^3*f^2*log(e) - 6*c*d^2
*f*g + 2*c^2*d*g^2)*b^3)*B^2*x + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g
*x^2 + 3*B^2*b^3*d^3*f^2*x + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g
^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d^3)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int (f+g\,x)^2\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.274 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=281

$$\frac{2B(bc-ad)(-adg-bcg+2bdf)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{b^2d^2}-\frac{(bf-ag)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{2b^2g}-2Bg($$

```
[Out] -2*B*(-a*d+b*c)*g*(b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/b^2/d-1/2*(-a*g+b
*f)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b^2/g+1/2*(g*x+f)^2*(A+B*ln(e*(b*x+
a)^2/(d*x+c)^2))^2/g+2*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(A+B*ln(e*(b*x+a
)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b^2/d^2+4*B^2*(-a*d+b*c)^2*g*ln(d*
x+c)/b^2/d^2+4*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*polylog(2,d*(b*x+a)/b/
(d*x+c))/b^2/d^2
```

Rubi [A] time = 0.96, antiderivative size = 450, normalized size of antiderivative = 1.60, number of steps used = 25, number of rules used = 12, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.414, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{4B^2(bf-ag)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}-\frac{4B^2(df-cg)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2g}-\frac{2B(bf-ag)^2\log(a+bx)\Bigl(B\log\Bigl(}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g*x)/(b*d) + (2*B^2*(b*f - a*g)^2*Log[a + b*x]^2)/(b^2*
g) - (2*B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b^2*
d) - (2*B*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2
]))/(b^2*g) + ((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(2*g
) + (4*B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b^2*d^2) - (4*B^2*(d*f - c*g)^2*L
og[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*g) + (2*B*(d*f - c*g)^2
*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(d^2*g) + (2*B^2*(d
*f - c*g)^2*Log[c + d*x]^2)/(d^2*g) - (4*B^2*(b*f - a*g)^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b^2*g) - (4*B^2*(b*f - a*g)^2*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(b^2*g) - (4*B^2*(d*f - c*g)^2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/(d^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
```

```
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{B\int\frac{2(bc-ad)(f+gx)^2\left(A+B\log\left(\frac{e(a+bx}{(c+dx)}\right.\right.}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{(2B(bc-ad))\int\frac{(f+gx)^2\left(A+B\log\right.}{(a+bx)(c+}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{(2B(bc-ad))\int\left(\frac{g^2\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.}{bd}\right.}{}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{(2B(bc-ad)g)\int\left(A+B\log\left(\right.\right.}{bd}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B(bf-ag)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{b^2g}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf}{}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf}{}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf}{}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf}{}$$

$$= -\frac{2AB(bc-ad)gx}{bd} + \frac{2B^2(bf-ag)^2\log^2(a+bx)}{b^2g} - \frac{2B^2(bc-ad)g(}{}$$

$$= -\frac{2AB(bc-ad)gx}{bd} + \frac{2B^2(bf-ag)^2\log^2(a+bx)}{b^2g} - \frac{2B^2(bc-ad)g(}{}$$

Mathematica [A] time = 0.31, size = 351, normalized size = 1.25

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2 - \frac{4B\left(-b^2(df-cg)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+d^2(bf-ag)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+Abd\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] ((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (4*B*(A*b*d*(b*c
- a*d)*g^2*x + B*d*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^
2] + d^2*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]
) - 2*B*(b*c - a*d)^2*g^2*Log[c + d*x] - b^2*(d*f - c*g)^2*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - B*d^2*(b*f - a*g)^2*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + b^2*B*(d*f - c*g)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)))/(b^2*d^2))/(2*g)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\Bigg(A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 + 2\left(ABgx + ABf\right)\log\Bigg(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b^2*e*x^2 + 2*a*b*e*x + a
^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g*x + A*B*f)*log((b^2*e*x^2 + 2
*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(gx + f\right)\left(B\log\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 1.01, size = 0, normalized size = 0.00

$$\int \left(gx + f\right)\left(B\ln\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((g*x+f)*(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [B] time = 1.55, size = 786, normalized size = 2.80

$$\frac{1}{2}A^2gx^2 + 2\Bigg(x\log\left(\frac{b^2ex^2}{d^2x^2 + 2\,cdx + c^2} + \frac{2\,abex}{d^2x^2 + 2\,cdx + c^2} + \frac{a^2e}{d^2x^2 + 2\,cdx + c^2}\right) + \frac{2\,a\log\left(bx + a\right)}{b} - \frac{2\,c\log\left(dx +\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*g*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d
^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x +
a)/b - 2*c*log(d*x + c)/d)*A*B*f + (x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x +
c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2
)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d
))*A*B*g + A^2*f*x - 2*(2*a*c*d*g + (2*c*d*f*log(e) - (g*log(e) + 2*g)*c^2)
*b)*B^2*log(d*x + c)/(b*d^2) + 4*(2*a*b*d^2*f - a^2*d^2*g - (2*c*d*f - c^2*
```

```
g)*b^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(2*a
*b*d^2*g*log(e) + (d^2*f*log(e)^2 - 2*c*d*g*log(e))*b^2)*B^2*x + 4*(B^2*b^2
*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x + (2*a*b*d^2*f - a^2*d^2*g)*B^2)*log(b*x + a
)^2 + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x + (2*c*d*f - c^2*g)*B^2*b^2)
*log(d*x + c)^2 + 4*(B^2*b^2*d^2*g*x^2*log(e) + 2*(a*b*d^2*g + (d^2*f*log(e
) - c*d*g)*b^2)*B^2*x - ((g*log(e) - 2*g)*a^2*d^2 - 2*(d^2*f*log(e) - c*d*g
)*a*b)*B^2)*log(b*x + a) - 4*(B^2*b^2*d^2*g*x^2*log(e) + 2*(a*b*d^2*g + (d^
2*f*log(e) - c*d*g)*b^2)*B^2*x + 2*(B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x +
 (2*a*b*d^2*f - a^2*d^2*g)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(f+g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.275 $\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=129

$$\frac{4B(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{b}+\frac{8B^2(bc-ad)\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)}{bd}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/b+4*B*(-a*d+b*c)*(A+B*ln(e*(b*x+a
)^2/(d*x+c)^2))*ln((-a*d+b*c)/b/(d*x+c))/b/d+8*B^2*(-a*d+b*c)*polylog(2,d*(
b*x+a)/b/(d*x+c))/b/d
```

Rubi **[A]** time = 0.77, antiderivative size = 252, normalized size of antiderivative = 1.95, number of steps used = 22, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2523, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{8aB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b}+\frac{8B^2c\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d}+\frac{4aB\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{b}-\frac{4Bc\log(c+dx)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-4*a*B^2*Log[a + b*x]^2)/b + (4*a*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/b + x*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (8*B^2*
c*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (4*B*c*(A + B*Log[(e*
(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/d - (4*B^2*c*Log[c + d*x]^2)/d + (
8*a*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (8*a*B^2*PolyLog[2
, -((d*(a + b*x))/(b*c - a*d))])/b + (8*B^2*c*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/d
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - (2B)\int \frac{2(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - (4B(bc-ad))\int \frac{x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - (4B(bc-ad))\int \left(-\frac{a\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)} + \right.$$

$$= x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 + (4aB)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}dx - (4Bc)\int \frac{A}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 + \frac{8B^2c}{}$$

$$= -\frac{4aB^2\log^2(a+bx)}{b} + \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\right.$$

$$= -\frac{4aB^2\log^2(a+bx)}{b} + \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\right.$$

Mathematica [A] time = 0.17, size = 220, normalized size = 1.71

$$\frac{4B\left(ad\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right) - bc\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right) - aBd\left(\log(a+bx)\left(\log(a+bx)\right.\right.\right.}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] x*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (4*B*(a*d*Log[a + b*x]*(A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - b*c*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])*Log[c + d*x] - a*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*c*((2
*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])))/(b*d)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2 + 2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right) + A^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) +
 A^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [F] time = 0.88, size = 0, normalized size = 0.00

$$\int\left(B\ln\left(\frac{(bx+a)^2\,e}{(dx+c)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\left(x\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+\frac{2\left(\frac{ae\log(bx+a)}{b}-\frac{ce\log(dx+c)}{d}\right)}{e}\right)AB+A^2x+B^2\left(\frac{4\left(bdx\log(bx+a)^2+(bdx+bc)\log(dx+\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] 2*(x*log((b*x + a)^2*e/(d*x + c)^2) + 2*(a*e*log(b*x + a)/b - c*e*log(d*x +
 c)/d)/e)*A*B + A^2*x + B^2*(4*(b*d*x*log(b*x + a)^2 + (b*d*x + b*c)*log(d*
x + c)^2 - (b*d*x*log(e) + 2*(b*d*x + a*d)*log(b*x + a))*log(d*x + c))/(b*d
) + integrate(((log(e)^2 + 4*log(e))*b^2*d*x^2 + a*b*c*log(e)^2 + (b^2*c*lo
g(e)^2 + (log(e)^2 + 4*log(e))*a*b*d)*x + 4*(b^2*d*x^2*log(e) + a*b*c*log(e
) + 2*a^2*d + (a*b*d*(log(e) + 4) + b^2*c*(log(e) - 2))*x)*log(b*x + a))/(b
^2*d*x^2 + a*b*c + (b^2*c + a*b*d)*x), x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.276 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{f+gx}\,dx$

Optimal. Leaf size=285

$$\frac{4B\text{Li}_2\left(\frac{(df-cg)(a+bx)}{(bf-ag)(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}+\frac{\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g}-\frac{4B\text{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\right.}{g}$$

```
[Out] -(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2*ln((-a*d+b*c)/b/(d*x+c))/g+(A+B*ln(e*(b*
x+a)^2/(d*x+c)^2))^2*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/g-4*B*(A+B
*ln(e*(b*x+a)^2/(d*x+c)^2))*polylog(2,d*(b*x+a)/b/(d*x+c))/g+4*B*(A+B*ln(e*
(b*x+a)^2/(d*x+c)^2))*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/g+8*
B^2*polylog(3,d*(b*x+a)/b/(d*x+c))/g-8*B^2*polylog(3,(-c*g+d*f)*(b*x+a)/(-a
*g+b*f)/(d*x+c))/g
```

Rubi [B] time = 5.85, antiderivative size = 2126, normalized size of antiderivative = 7.46, number of steps used = 44, number of rules used = 21, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.677, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2437, 2435, 2315}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x),x]
```

```
[Out] (-4*A*B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g - (B^2*Log[(a + b
*x)^2]^2*Log[f + g*x])/g - (B^2*Log[(c + d*x)^(-2)]^2*Log[f + g*x])/g + (4*
B^2*Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[(a + b*x)^2] + Log[(c + d*x)^(-2
)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/g + ((A + B*Log[(e*(a
+ b*x)^2)/(c + d*x)^2])^2*Log[f + g*x])/g + (8*B^2*Log[-((d*(a + b*x))/(b*c
 - a*d))]*Log[c + d*x]*Log[f + g*x])/g - (4*B^2*Log[-((g*(a + b*x))/(b*f -
a*g))]*(Log[(c + d*x)^(-2)] + 2*Log[c + d*x])*Log[f + g*x])/g + (8*B^2*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[f + g*x])/g + (4*A*B*Log[-((g*(
c + d*x))/(d*f - c*g))]*Log[f + g*x])/g - (4*B^2*(2*Log[a + b*x] - Log[(a +
 b*x)^2])*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g - (4*B^2*(Log[(
a + b*x)^2] + Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[-
((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g + (B^2*Log[(a + b*x)^2]^2*Log[
(b*(f + g*x))/(b*f - a*g)])/g + (B^2*Log[(c + d*x)^(-2)]^2*Log[(d*(f + g*x)
)/(d*f - c*g)])/g + (4*B^2*(Log[(b*(c + d*x))/(b*c - a*d)] + Log[(b*f - a*g
)/(b*(f + g*x))] - Log[((b*f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])*Lo
g[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]^2)/g - (4*B^2*(Log[(b
*(c + d*x))/(b*c - a*d)] - Log[-((g*(c + d*x))/(d*f - c*g))])*(Log[a + b*x]
 + Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])^2)/g + (4*B^2*(
Log[-((d*(a + b*x))/(b*c - a*d))] + Log[(d*f - c*g)/(d*(f + g*x))] - Log[-(
((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])*Log[((b*c - a*d)*(f + g*
x))/((b*f - a*g)*(c + d*x))]^2)/g - (4*B^2*(Log[-((d*(a + b*x))/(b*c - a*d)
)] - Log[-((g*(a + b*x))/(b*f - a*g))])*(Log[c + d*x] + Log[((b*c - a*d)*(f
 + g*x))/((b*f - a*g)*(c + d*x))])^2)/g + (8*B^2*(Log[f + g*x] - Log[-(((b*
c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/g + (4*B^2*Log[(a + b*x)^2]*PolyLog[2, -((g*(a + b*x))/(b*f -
 a*g))])/g + (8*B^2*(Log[f + g*x] - Log[((b*c - a*d)*(f + g*x))/((b*f - a*g
)*(c + d*x))])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/g - (4*B^2*Log[(c + d
*x)^(-2)]*PolyLog[2, -((g*(c + d*x))/(d*f - c*g))])/g - (8*B^2*Log[-(((b*c
- a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]*PolyLog[2, (g*(a + b*x))/(b*(f
+ g*x))])/g + (8*B^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))
]*PolyLog[2, -(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (8*B^
```

```
2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]*PolyLog[2, (g*(c + d
*x))/(d*(f + g*x))])/g + (8*B^2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c
 + d*x))]*PolyLog[2, ((b*f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])/g -
(4*A*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (4*B^2*(Log[(a + b*x)^2]
+ Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*PolyLog[2, (b*(f
+ g*x))/(b*f - a*g)])/g - (4*B^2*(Log[(c + d*x)^(-2)] + 2*Log[c + d*x])*Pol
yLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (8*B^2*(Log[c + d*x] + Log[((b*c -
a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(f + g*x))/(b*f - a
*g)])/g + (4*A*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (4*B^2*(2*Log[a
 + b*x] - Log[(a + b*x)^2])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (4*B
^2*(Log[(a + b*x)^2] + Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^
2])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g + (8*B^2*(Log[a + b*x] + Log[-
(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, (d*(f + g*x)
)/(d*f - c*g)])/g - (8*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/g - (8
*B^2*PolyLog[3, -((g*(a + b*x))/(b*f - a*g))])/g - (8*B^2*PolyLog[3, (b*(c
+ d*x))/(b*c - a*d)])/g - (8*B^2*PolyLog[3, -((g*(c + d*x))/(d*f - c*g))])/
g - (8*B^2*PolyLog[3, (g*(a + b*x))/(b*(f + g*x))])/g + (8*B^2*PolyLog[3, -
(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (8*B^2*PolyLog[3, (
g*(c + d*x))/(d*(f + g*x))])/g + (8*B^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/
((b*c - a*d)*(f + g*x))])/g - (8*B^2*PolyLog[3, (b*(f + g*x))/(b*f - a*g)])
/g - (8*B^2*PolyLog[3, (d*(f + g*x))/(d*f - c*g)])/g
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2435

```
Int[(Log[(a_) + (b_.)*(x_)]*Log[(c_) + (d_.)*(x_)])/(x_), x_Symbol] :> Simp
[Log[-((b*x)/a)]*Log[a + b*x]*Log[c + d*x], x] + (Simp[(1*(Log[-((b*x)/a)]
- Log[-(((b*c - a*d)*x)/(a*(c + d*x)))] + Log[(b*c - a*d)/(b*(c + d*x))])*L
og[(a*(c + d*x))/(c*(a + b*x))]^2)/2, x] - Simp[(1*(Log[-((b*x)/a)] - Log[-
((d*x)/c)])*(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])^2)/2, x] + Si
mp[(Log[c + d*x] - Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1 + (b*x)/a
], x] + Simp[(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1
 + (d*x)/c], x] + Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2, (c*(a +
b*x))/(a*(c + d*x))], x] - Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))], x] - Simp[PolyLog[3, 1 + (b*x)/a], x] - Simp
[PolyLog[3, 1 + (d*x)/c], x] + Simp[PolyLog[3, (c*(a + b*x))/(a*(c + d*x))]
, x] - Simp[PolyLog[3, (d*(a + b*x))/(b*(c + d*x))], x]) /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2437

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*Log[(h_.)*((i_.) + (j_.)*(x_))^(m
_.)])/(x_), x_Symbol] :> Dist[m, Int[(Log[i + j*x]*Log[c*(d + e*x)^n])/x, x
], x] - Dist[m*Log[i + j*x] - Log[h*(i + j*x)^m], Int[Log[c*(d + e*x)^n]/x,
 x], x] /; FreeQ[{c, d, e, h, i, j, m, n}, x] && NeQ[e*i - d*j, 0] && NeQ[i
 + j*x, h*(i + j*x)^m]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{f+gx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\bigl(A+B\log\bigl(}{e(a+bx)^2}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\bigl(A+B\log\bigl(}{(a+bx)^2}}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{2(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx}{(a+bx)(c+dx)}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4B(bc-ad))\int\Biggl(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+}{(bc-ad)(a+bx)}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4bB)\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{a+bx}\,dx}{g} + \bigl($$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4bB)\int\Biggl(\frac{A\log(f+gx)}{a+bx}+\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\log(f+}{a+bx}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4AbB)\int\frac{\log(f+gx)}{a+bx}\,dx}{g} - \frac{\left(4bB^2\right)\int \frac{\log\bigl(\frac{e(}{(c}}{}}{}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} + \frac{4A}{}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{4B^2\log\left(-\frac{g(a+bx)}{bf-ag}\right)\bigl(\log\left((a+bx)^2\right)+\log}{g}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^2\right)\log(f+gx)}{g} - \frac{B^2\log^2}{}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^2\right)\log(f+gx)}{g} - \frac{B^2\log^2}{}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^2\right)\log(f+gx)}{g} - \frac{B^2\log^2}{}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^2\right)\log(f+gx)}{g} - \frac{B^2\log^2}{}$$

Mathematica [F] time = 2.30, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{f+gx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x), x]
```

fricas [F] time = 0.80, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g*x + f), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f), x)
```

maple [F] time = 1.06, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f),x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{A^2\log\left(gx+f\right)}{g}-\int-\frac{4\,B^2\log\left(bx+a\right)^2+B^2\log(e)^2+2\,AB\log(e)+4\left(B^2\log(e)+AB\right)\log\left(bx+a\right)-4\big(2\,B^2\,\mathrm{lc}}{gx+f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x, algorithm="maxima")
```

```
[Out] A^2*log(g*x + f)/g - integrate(-(4*B^2*log(b*x + a)^2 + B^2*log(e)^2 + 2*A*
B*log(e) + 4*(B^2*log(e) + A*B)*log(b*x + a) - 4*(2*B^2*log(b*x + a) + B^2*
log(e) + A*B)*log(d*x + c))/(g*x + f), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)^2}{f+g\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(A + B \log{\left(\frac{a^{2} e}{c^{2} + 2 c d x + d^{2} x^{2}} + \frac{2 a b e x}{c^{2} + 2 c d x + d^{2} x^{2}} + \frac{b^{2} e x^{2}}{c^{2} + 2 c d x + d^{2} x^{2}} \right)}\right)^{2}}{f + g x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f),x)
```

```
[Out] Integral((A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 +
 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)))**2/(f +
g*x), x)
```

3.277 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^2}\,dx$

Optimal. Leaf size=200

$$\frac{4B(bc-ad)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{(bf-ag)(df-cg)}+\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{(f+gx)(bf-ag)}+\frac{8B^2(bc-ad)\mathrm{Li}_2\left(\frac{(df-}{(bf-}\right.}{(bf-ag)(df-}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(-a*g+b*f)/(g*x+f)+4*B*(-a*d+b*c)
*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c)
)/(-a*g+b*f)/(-c*g+d*f)+8*B^2*(-a*d+b*c)*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g
+b*f)/(d*x+c))/(-a*g+b*f)/(-c*g+d*f)
```

Rubi [B] time = 1.30, antiderivative size = 620, normalized size of antiderivative = 3.10, number of steps used = 32, number of rules used = 10, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.323, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{8bB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g(bf-ag)}+\frac{8B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g(df-cg)}-\frac{8B^2(bc-ad)\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{(bf-ag)(df-cg)}+\frac{8B^2(bc-ad)\text{PolyLog}}{(bf-ag)(df}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^2,x]
```

```
[Out] (-4*b*B^2*Log[a + b*x]^2)/(g*(b*f - a*g)) + (4*b*B*Log[a + b*x]*(A + B*Log[
(e*(a + b*x)^2)/(c + d*x)^2]))/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x)^2)
/(c + d*x)^2])^2/(g*(f + g*x)) + (8*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(g*(d*f - c*g)) - (4*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2])*Log[c + d*x])/(g*(d*f - c*g)) - (4*B^2*d*Log[c + d*x]^2)/(g*(d*f - c*
g)) + (8*b*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g))
 - (8*B^2*(b*c - a*d)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f
 - a*g)*(d*f - c*g)) + (4*B*(b*c - a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2])*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (8*B^2*(b*c - a*d)*Log[-((g
*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (8*b*B^
2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f - a*g)) + (8*B^2*d*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*g)) - (8*B^2*(b*c - a*d)*Pol
yLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)*(d*f - c*g)) + (8*B^2*(b*c
 - a*d)*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/((b*f - a*g)*(d*f - c*g))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{(4B(bc-ad))\int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{(c+dx)}\right.\right.}{(bc-ad)(-df+cg)(c}\right.}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{\left(4b^2B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{g(bf-ag)} - \frac{\left(4Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.}{c+dx}}{g(df-cg)}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\,l\right.}{}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\,l\right.}{}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\,l\right.}{}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\,l\right.}{}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{8B^2d\log\left(-\frac{d}{}\right.}{g(}$$

$$= -\frac{4bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+}{(c+d}\right.}{g(f+gx)}$$

$$= -\frac{4bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+}{(c+d}\right.}{g(f+gx)}$$

Mathematica [B] time = 0.59, size = 409, normalized size = 2.04

$$\frac{4B\left(b\log(a+bx)(df-cg)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-d(bf-ag)\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+g(bc-ad)\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-bB(df-cg)\left(\log(a+b\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)) + (4*B*(b*(d*f - c
*g)*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - d*(b*f - a*g)*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] + (b*c - a*d)*g*(A + B
*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x] - b*B*(d*f - c*g)*(Log[a +
```

```
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) + B*d*(b*f - a*g)*((2*Log[(d*(a + b*x))/(-(b*c) +
 a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)]) - 2*B*(b*c - a*d)*g*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d
*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)]
- PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)*(d*f - c*g)))/g
```

fricas [F] time = 1.46, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{g^2x^2+2\,fgx+f^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^2*x^2 + 2*f*g*x + f^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{(gx+f)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^2, x)
```

maple [F] time = 1.26, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{(gx+f)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^2,x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,AB\left(\frac{2\,b\log(bx+a)}{bfg-ag^2}-\frac{2\,d\log(dx+c)}{dfg-cg^2}+\frac{2\,(bc-ad)\log\left(gx+f\right)}{bdf^2+acg^2-(bc+ad)fg}-\frac{\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\right.}{g^2x+fg}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x, algorithm="maxima
")
```

```
[Out] 2*A*B*(2*b*log(b*x + a)/(b*f*g - a*g^2) - 2*d*log(d*x + c)/(d*f*g - c*g^2)
+ 2*(b*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b^
2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a
```

```
^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(g^2*x + f*g)) - B^2*(4*log(d*x + c)^2/(g^2
*x + f*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + 4*(d*g*x + c*g)*log
(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 4*((g*log(e) - 2
*g)*d*x + c*g*log(e) - 2*d*f + 2*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/
(d*g^3*x^3 + c*f^2*g + (2*d*f*g^2 + c*g^3)*x^2 + (d*f^2*g + 2*c*f*g^2)*x),
x)) - A^2/(g^2*x + f*g)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2}{\left(f+g\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**2,x)
```

```
[Out] Timed out
```

3.278 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^3}\,dx$

Optimal. Leaf size=381

$$\frac{b^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{2g(bf-ag)^2}+\frac{2Bg(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{(f+gx)(bf-ag)^2(df-cg)}+\frac{2B(bc-ad)(-adg-bcg+2bdf)\log}{(bf-ag}$$

```
[Out] 2*B*(-a*d+b*c)*g*(b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)^2/(-c*g
+d*f)/(g*x+f)+1/2*b^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/g/(-a*g+b*f)^2-1/2*
(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/g/(g*x+f)^2+4*B^2*(-a*d+b*c)^2*g*ln((g*x+
f)/(d*x+c))/(-a*g+b*f)^2/(-c*g+d*f)^2+2*B*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)
*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c)
)/(-a*g+b*f)^2/(-c*g+d*f)^2+4*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*polylog
(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^2/(-c*g+d*f)^2
```

Rubi [B] time = 1.64, antiderivative size = 899, normalized size of antiderivative = 2.36, number of steps used = 36, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.355$, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{2B^2\log^2(a+bx)b^2}{g(bf-ag)^2}+\frac{2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)b^2}{g(bf-ag)^2}+\frac{4B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^2}{g(bf-ag)^2}+\frac{4B^2\text{PolyLog}}{g(b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^3,x]
```

```
[Out] (4*b*B^2*(b*c - a*d)*Log[a + b*x])/((b*f - a*g)^2*(d*f - c*g)) - (2*b^2*B^2
*Log[a + b*x]^2)/(g*(b*f - a*g)^2) - (2*B*(b*c - a*d)*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2]))/((b*f - a*g)*(d*f - c*g)*(f + g*x)) + (2*b^2*B*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(g*(b*f - a*g)^2) - (A + B*
Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(2*g*(f + g*x)^2) - (4*B^2*d*(b*c - a*d
)*Log[c + d*x])/((b*f - a*g)*(d*f - c*g)^2) + (4*B^2*d^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x])/(g*(d*f - c*g)^2) - (2*B*d^2*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(g*(d*f - c*g)^2) - (2*B^2*d^2*Log[c
 + d*x]^2)/(g*(d*f - c*g)^2) + (4*b^2*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b
*c - a*d)])/(g*(b*f - a*g)^2) + (4*B^2*(b*c - a*d)^2*g*Log[f + g*x])/((b*f
- a*g)^2*(d*f - c*g)^2) - (4*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[
-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) +
 (2*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^2)/(c +
 d*x)^2])*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (4*B^2*(b*c - a*d)*
(2*b*d*f - b*c*g - a*d*g)*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(
(b*f - a*g)^2*(d*f - c*g)^2) + (4*b^2*B^2*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))])/(g*(b*f - a*g)^2) + (4*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/(g*(d*f - c*g)^2) - (4*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLo
g[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)^2*(d*f - c*g)^2) + (4*B^2*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/(
(b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2}+\frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2}+\frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2}+\frac{(2B(bc-ad))\int\Bigg(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3\Big(A+B\log\Big(\frac{e(}{(c}}{(bc-ad)(-df+cg}}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2}+\frac{\left(2b^3B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{g(bf-ag)^2}-\frac{\left(2Bd^3\right)\int \frac{A+B\log\Big(\frac{e(a}{(c+}}{c+dx}}{g(df-cg)^2}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{2b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)^2}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{2b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)^2}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{2b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)^2}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{2b^2B\log(a}{}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{2b^2B\log(a}{}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{2b^2B^2\log^2(a+bx)}{g(bf-ag)^2}-\frac{2B(bc-ad)\Big(A+B\log\Big(\frac{e(}{(c}}{(bf-ag)(df-cg)(f+}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{2b^2B^2\log^2(a+bx)}{g(bf-ag)^2}-\frac{2B(bc-ad)\Big(A+B\log\Big(\frac{e(}{(c}}{(bf-ag)(df-cg)(f+}$$

Mathematica [A] time = 1.58, size = 603, normalized size = 1.58

$$-\frac{\frac{4B(f+gx)\left(-b^2(f+gx)\log(a+bx)(df-cg)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+d^2(f+gx)(bf-ag)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+g(bc-ad)(bf-ag)(df-cg)\Big(B\,\mathrm{l}\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^3,x]
```

```
[Out] -1/2*((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (4*B*(f + g*x)*((b*c - a
*d)*g*(b*f - a*g)*(d*f - c*g)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - b^
2*(d*f - c*g)^2*(f + g*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2]) + d^2*(b*f - a*g)^2*(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
*Log[c + d*x] + (b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*L
og[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x] - 2*B*(b*c - a*d)*g*(f + g*x)
*(b*(d*f - c*g)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d
)*g*Log[f + g*x]) + b^2*B*(d*f - c*g)^2*(f + g*x)*(Log[a + b*x]*(Log[a + b*
x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
 + a*d)]) - B*d^2*(b*f - a*g)^2*(f + g*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
) - 2*B*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*((Log[(g*(a + b*
x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + Pol
yLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])
))/((b*f - a*g)^2*(d*f - c*g)^2))/(g*(f + g*x)^2)
```

fricas [F] time = 0.87, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{B^{2}\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\,AB\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+A^{2}}{g^{3}x^{3}+3\,fg^{2}x^{2}+3\,f^{2}gx+f^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^3*x^3 + 3*f*g^2*x^2 + 3*f^2*g*x + f^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}{\left(gx+f\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^3, x)
```

maple [F] time = 1.75, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}{\left(gx+f\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^3,x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\Bigg(\frac{2\,b^{2}\log\left(bx+a\right)}{b^{2}f^{2}g-2\,abfg^{2}+a^{2}g^{3}}-\frac{2\,d^{2}\log\left(dx+c\right)}{d^{2}f^{2}g-2\,cdfg^{2}+c^{2}g^{3}}+\frac{2\bigl(2\left(b^{2}cd-abd^{2}\right)f-\left(b^{2}c^{2}-a^{2}d^{2}\right)g\bigr)}{b^{2}d^{2}f^{4}+a^{2}c^{2}g^{4}-2\left(b^{2}cd+abd^{2}\right)f^{3}g+\bigl(b^{2}c^{2}+4\,abcd+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x, algorithm="maxima
")
```

```
[Out] (2*b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - 2*d^2*log(d*x + c
)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + 2*(2*(b^2*c*d - a*b*d^2)*f - (b^2*c
^2 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b
*d^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*
d)*f*g^3) - 2*(b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f
^2*g + a*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x +
 c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^
2))/(g^3*x^2 + 2*f*g^2*x + f^2*g))*A*B - B^2*(2*log(d*x + c)^2/(g^3*x^2 + 2
*f*g^2*x + f^2*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + 4*(d*g*x +
c*g)*log(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 4*((g*lo
g(e) - g)*d*x + c*g*log(e) - d*f + 2*(d*g*x + c*g)*log(b*x + a))*log(d*x +
c))/(d*g^4*x^4 + c*f^3*g + (3*d*f*g^3 + c*g^4)*x^3 + 3*(d*f^2*g^2 + c*f*g^3
)*x^2 + (d*f^3*g + 3*c*f^2*g^2)*x), x)) - 1/2*A^2/(g^3*x^2 + 2*f*g^2*x + f^
2*g)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)^2}{{\left(f+g\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^3, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**3,x)
```

```
[Out] Timed out
```

3.279 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^4}\,dx$

Optimal. Leaf size=724

$$\frac{4B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3(bf-ag)^3(df-cg)^3}$$

```
[Out] 4/3*B^2*(-a*d+b*c)^2*g^2*(d*x+c)/(-a*g+b*f)^2/(-c*g+d*f)^3/(g*x+f)-2/3*B*(-
a*d+b*c)*g^2*(d*x+c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)/(-c*g+d*f
)^3/(g*x+f)^2+4/3*B*(-a*d+b*c)*g*(-2*a*d*g-b*c*g+3*b*d*f)*(b*x+a)*(A+B*ln(e
*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)^3/(-c*g+d*f)^2/(g*x+f)+1/3*b^3*(A+B*ln(e*
(b*x+a)^2/(d*x+c)^2))^2/g/(-a*g+b*f)^3-1/3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^
2/g/(g*x+f)^3+4/3*B^2*(-a*d+b*c)^3*g^2*ln((b*x+a)/(d*x+c))/(-a*g+b*f)^3/(-c
*g+d*f)^3-4/3*B^2*(-a*d+b*c)^3*g^2*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d
*f)^3+8/3*B^2*(-a*d+b*c)^2*g*(-2*a*d*g-b*c*g+3*b*d*f)*ln((g*x+f)/(d*x+c))/(
-a*g+b*f)^3/(-c*g+d*f)^3+4/3*B*(-a*d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)
+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln(1-(-
c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3+8/3*B^2*(-a*
d+b*c)*(a^2*d^2*g^2-a*b*d*g*(-c*g+3*d*f)+b^2*(c^2*g^2-3*c*d*f*g+3*d^2*f^2))
*polylog(2,(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^3/(-c*g+d*f)^3
```

Rubi [A] time = 2.54, antiderivative size = 1369, normalized size of antiderivative = 1.89, number of steps used = 40, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{4B^2\log^2(a+bx)b^3}{3g(bf-ag)^3}+\frac{4B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)b^3}{3g(bf-ag)^3}+\frac{8B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^3}{3g(bf-ag)^3}+\frac{8B^2\text{PolyLog}\left(2\right.}{3g(bf-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^4,x]
```

```
[Out] (-4*B^2*(b*c - a*d)^2*g)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (4*b^2
*B^2*(b*c - a*d)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)) + (8*b*B^2*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*
g)^2) - (4*b^3*B^2*Log[a + b*x]^2)/(3*g*(b*f - a*g)^3) - (2*B*(b*c - a*d)*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*
x)^2) - (4*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2]))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (4*b^3*B*Log[
a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*g*(b*f - a*g)^3) - (A
 + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(3*g*(f + g*x)^3) - (4*B^2*d^2*(b*
c - a*d)*Log[c + d*x])/(3*(b*f - a*g)*(d*f - c*g)^3) - (8*B^2*d*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(3*(b*f - a*g)^2*(d*f - c*g)^3) +
(8*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*g*(d*f - c*g)
^3) - (4*B*d^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(3*g*
(d*f - c*g)^3) - (4*B^2*d^3*Log[c + d*x]^2)/(3*g*(d*f - c*g)^3) + (8*b^3*B^
2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*g*(b*f - a*g)^3) + (4*B^2
*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^3*(d*
f - c*g)^3) - (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2
*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f
 + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (4*B*(b*c - a*d)*(a^2*d^2*g^2 -
a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(
e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
+ (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2
```

```
- 3*c*d*f*g + c^2*g^2))*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(3*
(b*f - a*g)^3*(d*f - c*g)^3) + (8*b^3*B^2*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))])/(3*g*(b*f - a*g)^3) + (8*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])/(3*g*(d*f - c*g)^3) - (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*
f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyLog[2, (b*(f + g*x))/
(b*f - a*g)])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (8*B^2*(b*c - a*d)*(a^2*d^2
*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyL
og[2, (d*(f + g*x))/(d*f - c*g)])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^4}dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)^3}dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)^3}dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{(4B(bc-ad))\int \left(\frac{b^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)^3(a+bx)} + \frac{d^4\left(A+B\log\left(\frac{e(}{(}\right.\right.}{(bc-ad)(-df+cg}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{\left(4b^4B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}dx}{3g(bf-ag)^3} - \frac{\left(4Bd^4\right)\int \frac{A+B\log\left(\frac{e(a}{(c+}\right.}{c+dx}}{3g(df-cg)^3}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{4B(bc-ad)(2bdf-bcg-adg)\left(A+B\right.}{3(bf-ag)^2(df-cg)^2(f+g}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{4B(bc-ad)(2bdf-bcg-adg)\left(A+B\right.}{3(bf-ag)^2(df-cg)^2(f+g}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{4B(bc-ad)(2bdf-bcg-adg)\left(A+B\right.}{3(bf-ag)^2(df-cg)^2(f+g}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-a}{3}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-a}{3}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-a}{3}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-a}{3}$$

Mathematica **[A]** time = 3.37, size = 909, normalized size = 1.26

$$-\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 + \frac{2B(f+gx)\left(2d^3(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(c+dx)(bf-ag)^3-2Bd^3(f+gx)^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^4,x]
```

```
[Out] -1/3*((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*(f + g*x)*((b*c - a
*d)*g*(b*f - a*g)^2*(d*f - c*g)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
+ 2*(b*c - a*d)*g*(b*f - a*g)*(-(d*f) + c*g)*(-2*b*d*f + b*c*g + a*d*g)*(f
+ g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 2*b^3*(d*f - c*g)^3*(f +
```

```
g*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d^3*(b*f -
 a*g)^3*(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] -
 2*(b*c - a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3
*c*d*f*g + c^2*g^2))*(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*L
og[f + g*x] - 4*B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*(f + g*x)^2*(b*(d
*f - c*g)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Lo
g[f + g*x]) + 2*B*(b*c - a*d)*g*(f + g*x)*((b*c - a*d)*g*(b*f - a*g)*(d*f -
 c*g) - b^2*(d*f - c*g)^2*(f + g*x)*Log[a + b*x] + d^2*(b*f - a*g)^2*(f + g
*x)*Log[c + d*x] + (b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*Log[f
 + g*x]) + 2*b^3*B*(d*f - c*g)^3*(f + g*x)^2*(Log[a + b*x]*(Log[a + b*x] -
2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*
d)]) - 2*B*d^3*(b*f - a*g)^3*(f + g*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*
d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
 + 4*B*(b*c - a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2
 - 3*c*d*f*g + c^2*g^2))*(f + g*x)^2*((Log[(g*(a + b*x))/(-(b*f) + a*g)] -
Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/
(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)^3*(d*f
 - c*g)^3))/(g*(f + g*x)^3)
```

fricas [F] time = 0.98, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^{2}\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\,AB\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+A^{2}}{g^{4}x^{4}+4\,fg^{3}x^{3}+6\,f^{2}g^{2}x^{2}+4\,f^{3}gx+f^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^4*x^4 + 4*f*g^3*x^3 + 6*f^2*g^2*x^2 + 4*f^3*g*x + f^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}{\left(gx+f\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^4, x)
```

maple [F] time = 2.71, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}{\left(gx+f\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^4,x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x, algorithm="maxima
")
```

```
[Out] 2/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*
x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x +
 c^2))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*A*B - 1/3*B^2*(4*log(
d*x + c)^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) + 3*integrate(-1/3
*(3*d*g*x*log(e)^2 + 3*c*g*log(e)^2 + 12*(d*g*x + c*g)*log(b*x + a)^2 + 12*
(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 4*((3*g*log(e) - 2*g)*d*x + 3*c*
g*log(e) - 2*d*f + 6*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(d*g^5*x^5 +
 c*f^4*g + (4*d*f*g^4 + c*g^5)*x^4 + 2*(3*d*f^2*g^3 + 2*c*f*g^4)*x^3 + 2*(2
*d*f^3*g^2 + 3*c*f^2*g^3)*x^2 + (d*f^4*g + 4*c*f^3*g^2)*x), x)) - 1/3*A^2/(
g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2}{\left(f+g\,x\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^4,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**4,x)
```

```
[Out] Timed out
```

3.280 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^5}\,dx$

Optimal. Leaf size=1154

$$\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2b^4}{4g(bf-ag)^4}-\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4}+\frac{B(bc-ad)g((6d^2f^2-4cdgf+c^2g^2)b^2-2adg(4df-cg)b+}{(bf-ag)^4(df-cg)^3(f-}$$

```
[Out] -1/3*B^2*(-a*d+b*c)^2*g^3*(d*x+c)^2/(-a*g+b*f)^2/(-c*g+d*f)^4/(g*x+f)^2-2/3
*B^2*(-a*d+b*c)^3*g^3*(d*x+c)/(-a*g+b*f)^3/(-c*g+d*f)^4/(g*x+f)+B^2*(-a*d+b
*c)^2*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*(d*x+c)/(-a*g+b*f)^3/(-c*g+d*f)^4/(g*x+f
)+1/3*B*(-a*d+b*c)*g^3*(d*x+c)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)
/(-c*g+d*f)^4/(g*x+f)^3-1/2*B*(-a*d+b*c)*g^2*(-3*a*d*g-b*c*g+4*b*d*f)*(d*x+
c)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)^2/(-c*g+d*f)^4/(g*x+f)^2+B*
(-a*d+b*c)*g*(3*a^2*d^2*g^2-2*a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*g+6
*d^2*f^2))*(b*x+a)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(-a*g+b*f)^4/(-c*g+d*f)^
3/(g*x+f)+1/4*b^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/g/(-a*g+b*f)^4-1/4*(A+B
*ln(e*(b*x+a)^2/(d*x+c)^2))^2/g/(g*x+f)^4-2/3*B^2*(-a*d+b*c)^4*g^3*ln((b*x+
a)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4+B^2*(-a*d+b*c)^3*g^2*(-3*a*d*g-b*c*g+
4*b*d*f)*ln((b*x+a)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4+2/3*B^2*(-a*d+b*c)^4
*g^3*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-B^2*(-a*d+b*c)^3*g^2*(-3
*a*d*g-b*c*g+4*b*d*f)*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4+2*B^2*(
-a*d+b*c)^2*g*(3*a^2*d^2*g^2-2*a*b*d*g*(-c*g+4*d*f)+b^2*(c^2*g^2-4*c*d*f*g+
6*d^2*f^2))*ln((g*x+f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-B*(-a*d+b*c)*(-a*
d*g-b*c*g+2*b*d*f)*(2*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*
f^2))*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))*ln(1-(-c*g+d*f)*(b*x+a)/(-a*g+b*f)/(d
*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4-2*B^2*(-a*d+b*c)*(-a*d*g-b*c*g+2*b*d*f)*(2
*a*b*d^2*f*g-a^2*d^2*g^2-b^2*(c^2*g^2-2*c*d*f*g+2*d^2*f^2))*polylog(2,(-c*g
+d*f)*(b*x+a)/(-a*g+b*f)/(d*x+c))/(-a*g+b*f)^4/(-c*g+d*f)^4
```

Rubi **[A]** time = 3.54, antiderivative size = 1854, normalized size of antiderivative = 1.61, number of steps used = 44, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (5*B^2
*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^3*(d*f - c*g)^3*
(f + g*x)) + (2*b^3*B^2*(b*c - a*d)*Log[a + b*x])/(3*(b*f - a*g)^4*(d*f - c
*g)) + (b^2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/((b*f -
 a*g)^4*(d*f - c*g)^2) + (2*b*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f
 - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[a + b*x])/((b*f - a*g)
^4*(d*f - c*g)^3) - (b^4*B^2*Log[a + b*x]^2)/(g*(b*f - a*g)^4) - (B*(b*c -
a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*f - a*g)*(d*f - c*g)*(
f + g*x)^3) - (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b
*x)^2)/(c + d*x)^2]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*(b*c
 - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g +
 c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*f - a*g)^3*(d*f -
c*g)^3*(f + g*x)) + (b^4*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2]))/(g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(4*g*
(f + g*x)^4) - (2*B^2*d^3*(b*c - a*d)*Log[c + d*x])/(3*(b*f - a*g)*(d*f - c
*g)^4) - (B^2*d^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/((b*f
 - a*g)^2*(d*f - c*g)^4) - (2*B^2*d*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d
```

```
*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[c + d*x])/((b*f - a*
g)^3*(d*f - c*g)^4) + (2*B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/(g*(d*f - c*g)^4) - (B*d^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*L
og[c + d*x])/(g*(d*f - c*g)^4) - (B^2*d^4*Log[c + d*x]^2)/(g*(d*f - c*g)^4)
 + (2*b^4*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g)^4
) + (B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)^2*Log[f + g*x])/((b*f -
a*g)^4*(d*f - c*g)^4) + (8*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*
f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a
*g)^4*(d*f - c*g)^4) + (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*
d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[-((g*(a
+ b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c
 - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2
*f^2 - 2*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f
 + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) - (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*
g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*
g^2))*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)^4*(d*f -
 c*g)^4) + (2*b^4*B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f - a
*g)^4) + (2*B^2*d^4*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*g)^4
) + (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g
^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, (b*(f + g*x))/(b*f -
 a*g)])/((b*f - a*g)^4*(d*f - c*g)^4) - (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g
 - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g
^2))*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/((b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \Bigg(\frac{b^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5\Big(A+B\log\Big(}{(bc-ad)(-df+cg)}}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{\left(b^5B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{g(bf-ag)^4} - \frac{\left(Bd^5\right)\int \frac{A+B\log\Big(}{c+dx}}{g(df-cg)^4}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\Big(A+B\,\mathrm{lo}}{2(bf-ag)^2(df-cg)^2(f+gx}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\Big(A+B\,\mathrm{lo}}{2(bf-ag)^2(df-cg)^2(f+gx}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\Big(A+B\,\mathrm{lo}}{2(bf-ag)^2(df-cg)^2(f+gx}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3}{3}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3}{3}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3}{3}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3}{3}$$

Mathematica [A] time = 7.34, size = 1453, normalized size = 1.26

$$\frac{B(bc-ad)\Bigg(\frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)b^4}{(bc-ad)(bf-ag)^4} - \frac{B\left(\log^2(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a+bx)-2\mathrm{Li}_2\left(-\frac{d(a+bx)}{bc-ad}\right)\right)b^4}{(bc-ad)(bf-ag)^4} - \frac{g\left(\left(3d^2f^2-3cdgf+c^2g^2\right)b^2-}{(bf-}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^5,x]
```

```
[Out] -1/4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(g*(f + g*x)^4) + (B*(b*c -
 a*d)*(-1/3*(g*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*f - a*g)*(d*f
- c*g)*(f + g*x)^3) - (g*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^
```

```
2)/(c + d*x)^2]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2
*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)
) + (b^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*c - a*d
)*(b*f - a*g)^4) - (d^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*
x])/((b*c - a*d)*(d*f - c*g)^4) + (g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f
^2 - 2*b^2*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(A + B*Log[
(e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) +
 (2*B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 -
 3*c*d*f*g + c^2*g^2))*((b*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)) - (d*Log
[c + d*x])/((b*c - a*d)*(d*f - c*g)) + (g*Log[f + g*x])/((b*f - a*g)*(d*f -
 c*g))))/((b*f - a*g)^3*(d*f - c*g)^3) - (B*(b*c - a*d)*g*(2*b*d*f - b*c*g
- a*d*g)*(g/((b*f - a*g)*(d*f - c*g)*(f + g*x)) - (b^2*Log[a + b*x])/((b*c
- a*d)*(b*f - a*g)^2) + (d^2*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^2) - (g
*(2*b*d*f - b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)))/((
b*f - a*g)^2*(d*f - c*g)^2) - (B*(b*c - a*d)*g*(g/((b*f - a*g)*(d*f - c*g)*
(f + g*x)^2) + (2*g*(2*b*d*f - b*c*g - a*d*g))/((b*f - a*g)^2*(d*f - c*g)^2
*(f + g*x)) - (2*b^3*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^3) + (2*d^3*Log
[c + d*x])/((b*c - a*d)*(d*f - c*g)^3) - (2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f
 - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/((b*f - a*g)
^3*(d*f - c*g)^3)))/(3*(b*f - a*g)*(d*f - c*g)) - (b^4*B*(Log[a + b*x]^2 -
2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))]))/((b*c - a*d)*(b*f - a*g)^4) + (B*d^4*(2*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[c + d*x] - Log[c + d*x]^2 + 2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)]))/((b*c - a*d)*(d*f - c*g)^4) - (2*B*g*(2*b*d*f - b*c*g - a*d
*g)*(2*b^2*d^2*f^2 - 2*b^2*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*
g^2)*(Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x] - Log[-((g*(c + d*x))/
(d*f - c*g))]*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLo
g[2, (d*(f + g*x))/(d*f - c*g)]))/((b*f - a*g)^4*(d*f - c*g)^4)))/g
```

fricas [F] time = 2.08, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^{2}\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\,AB\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+A^{2}}{g^{5}x^{5}+5\,fg^{4}x^{4}+10\,f^{2}g^{3}x^{3}+10\,f^{3}g^{2}x^{2}+5\,f^{4}gx+f^{5}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^5*x^5 + 5*f*g^4*x^4 + 10*f^2*g^3*x^3 + 10*f^3*g^2*x^2 + 5*f^4*g*x
 + f^5), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}{(gx+f)^{5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^5, x)
```

maple [F] time = 4.09, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right)+A\right)^2}{\left(gx+f\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^5,x)
```

```
[Out] int((B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2/(g*x+f)^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x, algorithm="maxima
")
```

```
[Out] 1/6*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
+ 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d^
4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f*
g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4*
(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b^
2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*d
^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*d
^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2*
g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b*
c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c^
3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2*
d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2*
d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^3
*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*d
 + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*
c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g^
4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3*
(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)
*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3*
(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d)
*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^3
)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*c
^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^3
*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*c
^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^
2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^
4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 3*log(b^2*e*x^2/(d^2*x^2 +
2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c
*d*x + c^2))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g))
*A*B - B^2*(log(d*x + c)^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g
^2*x + f^4*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + 4*(d*g*x + c*g)
*log(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 2*((2*g*log(
e) - g)*d*x + 2*c*g*log(e) - d*f + 4*(d*g*x + c*g)*log(b*x + a))*log(d*x +
c))/(d*g^6*x^6 + c*f^5*g + (5*d*f*g^5 + c*g^6)*x^5 + 5*(2*d*f^2*g^4 + c*f*g
```

```
^5)*x^4 + 10*(d*f^3*g^3 + c*f^2*g^4)*x^3 + 5*(d*f^4*g^2 + 2*c*f^3*g^3)*x^2
+ (d*f^5*g + 5*c*f^4*g^2)*x), x)) - 1/4*A^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*
g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2}{\left(f+g\,x\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^5,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2/(f + g*x)^5, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**5,x)
```

```
[Out] Timed out
```

3.281 $\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=34

$$\mathrm{Int}\left(\frac{(f+gx)^2}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable((g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.000, Rules used = {}

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + 2*f*g*De
fer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x] + g^2*Defer[Int][x^
2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{f^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{2fgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{g^2x^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\ &= f^2\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+(2fg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+g^2\int \frac{}{A+B\,\mathrm{lo}}\end{aligned}$$

Mathematica [A] time = 0.18, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

fricas [A] time = 0.85, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(
d^2*x^2 + 2*c*d*x + c^2)) + A), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(gx+f)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

maple [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{(gx+f)^2}{B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int((g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(gx+f)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{(f+g\,x)^2}{A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] int((f + g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral((f + g*x)**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*
b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**
2))), x)
```

3.282 $\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{f+gx}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable((g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.000$, Rules used = {}

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + g*Defer[In
t][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{f}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\ &= f\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+g\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.15, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

fricas [A] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{gx+f}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*
x + c^2)) + A), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

maple [**A**] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int((g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f+g\,x}{A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] int((f + g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral((f + g*x)/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e
*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))
), x)
```

3.283 $\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable(1/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1),x]
```

```
[Out] Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x]
```

Rubi steps

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx=\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Mathematica [A] time = 0.04, size = 0, normalized size = 0.00

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x]
```

fricas [A] time = 0.87, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral(1/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
) + A), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

maple [A] time = 0.66, size = 0, normalized size = 0.00

$$\int \frac{1}{B \ln \left(\frac{(bx+a)^{2} e}{(dx+c)^{2}}\right)+A} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{B \log \left(\frac{(bx+a)^{2} e}{(dx+c)^{2}}\right)+A} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate(1/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{A+B \ln \left(\frac{e\,(a+b\,x)^{2}}{(c+d\,x)^{2}}\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)),x)
```

```
[Out] int(1/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{A+B \log \left(\frac{e(a+bx)^{2}}{(c+dx)^{2}}\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral(1/(A + B*log(e*(a + b*x)**2/(c + d*x)**2)), x)
```

3.284 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=34

$$\mathrm{Int}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

fricas [A] time = 0.93, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{Agx+Af+\left(Bgx+Bf\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral(1/(A*g*x + A*f + (B*g*x + B*f)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)
/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

maple [A] time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\ln\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))),x)
```

```
[Out] int(1/((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)\right)\left(f+gx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral(1/((A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**
2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)))*(f +
g*x)), x)
```

3.285 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Int}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.09, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

fricas [A] time = 1.84, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ag^2x^2+2\,Afgx+Af^2+\left(Bg^2x^2+2\,Bfgx+Bf^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
[Out] integral(1/(A*g^2*x^2 + 2*A*f*g*x + A*f^2 + (B*g^2*x^2 + 2*B*f*g*x + B*f^2)
*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

maple [**A**] time = 0.90, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^2\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)^2\,\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))),x)
```

```
[Out] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)\right)\left(f+gx\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Integral(1/((A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**
2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2)))*(f +
g*x)**2), x)
```

3.286 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Int}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.10, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

fricas [A] time = 1.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{Ag^3x^3+3\,Afg^2x^2+3\,Af^2gx+Af^3+\left(Bg^3x^3+3\,Bfg^2x^2+3\,Bf^2gx+Bf^3\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^3*x^3 + 3*A*f*g^2*x^2 + 3*A*f^2*g*x + A*f^3 + (B*g^3*x^3 +
3*B*f*g^2*x^2 + 3*B*f^2*g*x + B*f^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d
^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

maple [A] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

```
[Out] int(1/(g*x+f)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^3\,\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))),x)
```

```
[Out] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

3.287 $\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Int}\left(\frac{(f+gx)^2}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + 2*f*g*De
fer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x] + g^2*Defer[Int][
x^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx &= \int\left(\frac{f^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{2fgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}\right.\\ &= f^2\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+(2fg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+g^2\int\end{aligned}$$

Mathematica [A] time = 0.72, size = 0, normalized size = 0.00

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

fricas [A] time = 1.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)
/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(
d^2*x^2 + 2*c*d*x + c^2)) + A^2), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [**A**] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{\left(gx+f\right)^{2}}{\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdg^{2}x^{4}+acf^{2}+\left(adg^{2}+\left(2\,dfg+cg^{2}\right)b\right)x^{3}+\left(\left(2\,dfg+cg^{2}\right)a+\left(df^{2}+2\,cfg\right)b\right)x^{2}+\left(bcf^{2}+\left(df^{2}+2\,cfg\right)a\right)}{2\left(2\,(bc-ad)B^{2}\log\left(bx+a\right)-2\,(bc-ad)B^{2}\log\left(dx+c\right)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] -1/2*(b*d*g^2*x^4 + a*c*f^2 + (a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^3 + ((2*d*f
*g + c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x^2 + (b*c*f^2 + (d*f^2 + 2*c*f*g)*a)*
x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c
- a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(4*b*d*g^2*x^3
+ b*c*f^2 + 3*(a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^2 + (d*f^2 + 2*c*f*g)*a + 2
*((2*d*f*g + c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x)/(2*(b*c - a*d)*B^2*log(b*x
+ a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d
*log(e))*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(f+g\,x\right)}^2}{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((f + g*x)^2/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{acf^2 + 2acfgx + acg^2x^2 + adf^2x + 2adfgx^2 + adg^2x^3 + bcf^2x + 2bcfgx^2 + bcg^2x^3 + bdf^2x^2 + 2bdfgx^3 + bd}{2ABad - 2ABbc + \left(2B^2ad - 2B^2bc\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (a*c*f**2 + 2*a*c*f*g*x + a*c*g**2*x**2 + a*d*f**2*x + 2*a*d*f*g*x**2 + a*d
*g**2*x**3 + b*c*f**2*x + 2*b*c*f*g*x**2 + b*c*g**2*x**3 + b*d*f**2*x**2 +
2*b*d*f*g*x**3 + b*d*g**2*x**4)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B*
*2*b*c)*log(e*(a + b*x)**2/(c + d*x)**2)) - (Integral(a*d*f**2/(A + B*log(a
**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2)
 + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(b*c*f**2/(A +
B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**
2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(2*a*c*f
*g/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d
*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral
(2*a*c*g**2*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c
**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x)
 + Integral(3*a*d*g**2*x**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2)
+ 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d*
*2*x**2))), x) + Integral(3*b*c*g**2*x**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x
 + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2
+ 2*c*d*x + d**2*x**2))), x) + Integral(2*b*d*f**2*x/(A + B*log(a**2*e/(c**
2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*
x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(4*b*d*g**2*x**3/(A + B*l
og(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x
**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(4*a*d*f*g*
x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*
x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(
4*b*c*f*g*x/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**
2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) +
 Integral(6*b*d*f*g*x**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2
*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*
x**2))), x))/(2*B*(a*d - b*c))
```

3.288 $\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\text{Int}\left(\frac{f+gx}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable((g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + g*Defer[In
t][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx &= \int \left(\frac{f}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)dx\\ &= f\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+g\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

fricas [A] time = 2.12, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{gx+f}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*
d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*
x + c^2)) + A^2), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

maple [**A**] time = 0.77, size = 0, normalized size = 0.00

$$\int \frac{gx+f}{\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int((g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdgx^3+acf+\left(adg+\left(df+cg\right)b\right)x^2+\left(bcf+\left(df+cg\right)a\right)x}{2\left(2\,(bc-ad)B^2\log\,(bx+a)-2\,(bc-ad)B^2\log\,(dx+c)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^2\right)}+\int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] -1/2*(b*d*g*x^3 + a*c*f + (a*d*g + (d*f + c*g)*b)*x^2 + (b*c*f + (d*f + c*g
)*a)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) +
(b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(3*b*d*g*x
^2 + b*c*f + (d*f + c*g)*a + 2*(a*d*g + (d*f + c*g)*b)*x)/(2*(b*c - a*d)*B^
2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*lo
g(e) - a*d*log(e))*B^2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{f+g\,x}{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f + g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int((f + g*x)/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{acf+acgx+adfx+adgx^2+bcfx+bcgx^2+bdfx^2+bdgx^3}{2ABad-2ABbc+\left(2B^2ad-2B^2bc\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}-\frac{\int \frac{acg}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (a*c*f + a*c*g*x + a*d*f*x + a*d*g*x**2 + b*c*f*x + b*c*g*x**2 + b*d*f*x**2
 + b*d*g*x**3)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B**2*b*c)*log(e*(a
+ b*x)**2/(c + d*x)**2)) - (Integral(a*c*g/(A + B*log(a**2*e/(c**2 + 2*c*d*
x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2
 + 2*c*d*x + d**2*x**2))), x) + Integral(a*d*f/(A + B*log(a**2*e/(c**2 + 2*
c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(
c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(b*c*f/(A + B*log(a**2*e/(c**2
+ 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b**2*e*x*
*2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(2*a*d*g*x/(A + B*log(a**2*
e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b
**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(2*b*c*g*x/(A + B*l
og(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x
**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(2*b*d*f*x/
(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x
+ d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(3*
b*d*g*x**2/(A + B*log(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2
 + 2*c*d*x + d**2*x**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x))/(
2*B*(a*d - b*c))
```

3.289 $\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2),x]
```

```
[Out] Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x]
```

Rubi steps

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x]
```

fricas [A] time = 1.04, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^
2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
) + A^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^(-2), x)
```

maple [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdx^2+ac+(bc+ad)x}{2\left(2\,(bc-ad)B^2\log(bx+a)-2\,(bc-ad)B^2\log(dx+c)+(bc-ad)AB+\left(bc\log(e)-ad\log(e)\right)B^2\right)}+\int\frac{}{2\,(2\,(b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b
*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^
2) + integrate(1/2*(2*b*d*x + b*c + a*d)/(2*(b*c - a*d)*B^2*log(b*x + a) -
2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e)
)*B^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^2}{(c+d\,x)^2}\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2,x)
```

```
[Out] int(1/(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{ac+adx+bcx+bdx^2}{2ABad-2ABbc+\left(2B^2ad-2B^2bc\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}-\frac{\int\frac{ad}{A+B\log\left(\frac{a^2e}{c^2+2cdx+d^2x^2}+\frac{2abex}{c^2+2cdx+d^2x^2}+\frac{b^2ex^2}{c^2+2cdx+d^2x^2}\right)}\,dx+\int\frac{}{A+B\log\left(\frac{}{c^2}\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] (a*c + a*d*x + b*c*x + b*d*x**2)/(2*A*B*a*d - 2*A*B*b*c + (2*B**2*a*d - 2*B
**2*b*c)*log(e*(a + b*x)**2/(c + d*x)**2)) - (Integral(a*d/(A + B*log(a**2*
e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) + b
**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(b*c/(A + B*log(a**
2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x**2) +
 b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x) + Integral(2*b*d*x/(A + B*l
og(a**2*e/(c**2 + 2*c*d*x + d**2*x**2) + 2*a*b*e*x/(c**2 + 2*c*d*x + d**2*x
**2) + b**2*e*x**2/(c**2 + 2*c*d*x + d**2*x**2))), x))/(2*B*(a*d - b*c))
```

3.290 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\mathrm{Int}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

fricas [A] time = 2.10, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{A^2gx+A^2f+\left(B^2gx+B^2f\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(ABgx+ABf\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b^2*e*x^2 + 2*a*b*e*x
+ a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g*x + A*B*f)*log((b^2*e*x^2
+ 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

maple [**A**] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)\left(B\ln\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(g*x+f)/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{bdx^2+ac+(bc+}{2\left(\left(bcf-adf\right)AB+\left(bcf\log(e)-adf\log(e)\right)B^2+\left(\left(bcg-adg\right)AB+\left(bcg\log(e)-adg\log(e)\right)B^2\right)x+2\left(\left(bc\right.\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f - a*d*f)*A*B + (b*c*f*log(e) -
 a*d*f*log(e))*B^2 + ((b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B
^2)*x + 2*((b*c*g - a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(b*x + a) - 2*((
b*c*g - a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(d*x + c)) + integrate(1/2*(
b*d*g*x^2 + 2*b*d*f*x + b*c*f + (d*f - c*g)*a)/((b*c*f^2 - a*d*f^2)*A*B + (
b*c*f^2*log(e) - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*
log(e) - a*d*g^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*l
og(e) - a*d*f*g*log(e))*B^2)*x + 2*((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*
g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - 2*((b*c*g^2 -
a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*l
og(d*x + c)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\left(f+g\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2),x)
```

```
[Out] int(1/((f + g*x)*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.291 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\operatorname{Int}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}=$ 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.61, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

fricas [A] time = 0.80, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{1}{A^2g^2x^2+2\,A^2fgx+A^2f^2+\left(B^2g^2x^2+2\,B^2fgx+B^2f^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(ABg^2x^2+2\,AB\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
[Out] integral(1/(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*
x + B^2*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
```

```
^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x + A*B*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a
^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

maple [A] time = 1.33, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(g*x+f)^2/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{2\left(\left(bcf^{2}-adf^{2}\right)AB+\left(bcf^{2}\log(e)-adf^{2}\log(e)\right)B^{2}+\left(\left(bcg^{2}-adg^{2}\right)AB+\left(bcg^{2}\log(e)-adg^{2}\log(e)\right)B^{2}\right)x^{2}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f^2 - a*d*f^2)*A*B + (b*c*f^2*lo
g(e) - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*log(e) - a
*d*g^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*log(e) - a*
d*f*g*log(e))*B^2)*x + 2*((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*
g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - 2*((b*c*g^2 - a*d*g^2)*B
^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(d*x + c
)) - integrate(-1/2*(b*c*f + (d*f - 2*c*g)*a - (a*d*g - (2*d*f - c*g)*b)*x)
/(((b*c*g^3 - a*d*g^3)*A*B + (b*c*g^3*log(e) - a*d*g^3*log(e))*B^2)*x^3 + (
b*c*f^3 - a*d*f^3)*A*B + (b*c*f^3*log(e) - a*d*f^3*log(e))*B^2 + 3*((b*c*f*
g^2 - a*d*f*g^2)*A*B + (b*c*f*g^2*log(e) - a*d*f*g^2*log(e))*B^2)*x^2 + 3*(
(b*c*f^2*g - a*d*f^2*g)*A*B + (b*c*f^2*g*log(e) - a*d*f^2*g*log(e))*B^2)*x
+ 2*((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b
*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(b*x + a) - 2*((b
*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*
g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(d*x + c)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^2\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2),x)
```

```
[Out] int(1/((f + g*x)^2*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.292 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Int}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

fricas [A] time = 1.02, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{A^2g^3x^3+3\,A^2fg^2x^2+3\,A^2f^2gx+A^2f^3+\left(B^2g^3x^3+3\,B^2fg^2x^2+3\,B^2f^2gx+B^2f^3\right)\log\left(\frac{b^2ex^2+2\,abex+}{d^2x^2+2\,cdx+}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*
g^3*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b^2*e*x^2 + 2*a*b
```

```
*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x
^2 + 3*A*B*f^2*g*x + A*B*f^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2
+ 2*c*d*x + c^2))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

maple [A] time = 1.92, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\ln\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

```
[Out] int(1/(g*x+f)^3/(B*ln((b*x+a)^2/(d*x+c)^2*e)+A)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{}{2\Big(\big(\big(bcg^{3}-adg^{3}\big)AB+\big(bcg^{3}\log(e)-adg^{3}\log(e)\big)B^{2}\big)x^{3}+\big(bcf^{3}-adf^{3}\big)AB+\big(bcf^{3}\log(e)-adf^{3}\log(e)\big)B}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/(((b*c*g^3 - a*d*g^3)*A*B + (b*c*g^3*l
og(e) - a*d*g^3*log(e))*B^2)*x^3 + (b*c*f^3 - a*d*f^3)*A*B + (b*c*f^3*log(e
) - a*d*f^3*log(e))*B^2 + 3*((b*c*f*g^2 - a*d*f*g^2)*A*B + (b*c*f*g^2*log(e
) - a*d*f*g^2*log(e))*B^2)*x^2 + 3*((b*c*f^2*g - a*d*f^2*g)*A*B + (b*c*f^2*
g*log(e) - a*d*f^2*g*log(e))*B^2)*x + 2*((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b
*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3
- a*d*f^3)*B^2)*log(b*x + a) - 2*((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^
2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f
^3)*B^2)*log(d*x + c)) - integrate(1/2*(b*d*g*x^2 - b*c*f - (d*f - 3*c*g)*a
 + 2*(a*d*g - (d*f - c*g)*b)*x)/(((b*c*g^4 - a*d*g^4)*A*B + (b*c*g^4*log(e)
 - a*d*g^4*log(e))*B^2)*x^4 + 4*((b*c*f*g^3 - a*d*f*g^3)*A*B + (b*c*f*g^3*l
og(e) - a*d*f*g^3*log(e))*B^2)*x^3 + (b*c*f^4 - a*d*f^4)*A*B + (b*c*f^4*log
(e) - a*d*f^4*log(e))*B^2 + 6*((b*c*f^2*g^2 - a*d*f^2*g^2)*A*B + (b*c*f^2*g
^2*log(e) - a*d*f^2*g^2*log(e))*B^2)*x^2 + 4*((b*c*f^3*g - a*d*f^3*g)*A*B +
 (b*c*f^3*g*log(e) - a*d*f^3*g*log(e))*B^2)*x + 2*((b*c*g^4 - a*d*g^4)*B^2*
x^4 + 4*(b*c*f*g^3 - a*d*f*g^3)*B^2*x^3 + 6*(b*c*f^2*g^2 - a*d*f^2*g^2)*B^2
*x^2 + 4*(b*c*f^3*g - a*d*f^3*g)*B^2*x + (b*c*f^4 - a*d*f^4)*B^2)*log(b*x +
 a) - 2*((b*c*g^4 - a*d*g^4)*B^2*x^4 + 4*(b*c*f*g^3 - a*d*f*g^3)*B^2*x^3 +
6*(b*c*f^2*g^2 - a*d*f^2*g^2)*B^2*x^2 + 4*(b*c*f^3*g - a*d*f^3*g)*B^2*x + (
b*c*f^4 - a*d*f^4)*B^2)*log(d*x + c)), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{{\left(f+g\,x\right)}^3\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^2}{{\left(c+d\,x\right)}^2}\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2),x)
```

```
[Out] int(1/((f + g*x)^3*(A + B*log((e*(a + b*x)^2)/(c + d*x)^2))^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

3.293 $\int (g+hx)^4 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=365

$$-\frac{Bh^2nx^2(bc-ad)\left(a^2d^2h^2-abdh(5dg-ch)+b^2\left(c^2h^2-5cdgh+10d^2g^2\right)\right)}{10b^3d^3}+\frac{Bhnx(bc-ad)(a^3d^3h^3-a^2bd^2h^2}{}$$

```
[Out] 1/5*B*(-a*d+b*c)*h*(a^3*d^3*h^3-a^2*b*d^2*h^2*(-c*h+5*d*g)+a*b^2*d*h*(c^2*h
^2-5*c*d*g*h+10*d^2*g^2)-b^3*(-c^3*h^3+5*c^2*d*g*h^2-10*c*d^2*g^2*h+10*d^3*
g^3))*n*x/b^4/d^4-1/10*B*(-a*d+b*c)*h^2*(a^2*d^2*h^2-a*b*d*h*(-c*h+5*d*g)+b
^2*(c^2*h^2-5*c*d*g*h+10*d^2*g^2))*n*x^2/b^3/d^3-1/15*B*(-a*d+b*c)*h^3*(-a*
d*h-b*c*h+5*b*d*g)*n*x^3/b^2/d^2-1/20*B*(-a*d+b*c)*h^4*n*x^4/b/d-1/5*B*(-a*
h+b*g)^5*n*ln(b*x+a)/b^5/h+1/5*B*(-c*h+d*g)^5*n*ln(d*x+c)/d^5/h+1/5*(h*x+g)
^5*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/h
```

Rubi **[A]** time = 0.71, antiderivative size = 377, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {6742, 2492, 72}

$$-\frac{Bh^2nx^2(bc-ad)\left(a^2d^2h^2-abdh(5dg-ch)+b^2\left(c^2h^2-5cdgh+10d^2g^2\right)\right)}{10b^3d^3}+\frac{Bhnx(bc-ad)(-a^2bd^2h^2(5dg-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (B*(b*c - a*d)*h*(a^3*d^3*h^3 - a^2*b*d^2*h^2*(5*d*g - c*h) + a*b^2*d*h*(10
*d^2*g^2 - 5*c*d*g*h + c^2*h^2) - b^3*(10*d^3*g^3 - 10*c*d^2*g^2*h + 5*c^2*
d*g*h^2 - c^3*h^3))*n*x)/(5*b^4*d^4) - (B*(b*c - a*d)*h^2*(a^2*d^2*h^2 - a*
b*d*h*(5*d*g - c*h) + b^2*(10*d^2*g^2 - 5*c*d*g*h + c^2*h^2))*n*x^2)/(10*b^
3*d^3) - (B*(b*c - a*d)*h^3*(5*b*d*g - b*c*h - a*d*h)*n*x^3)/(15*b^2*d^2) -
 (B*(b*c - a*d)*h^4*n*x^4)/(20*b*d) + (A*(g + h*x)^5)/(5*h) - (B*(b*g - a*h
)^5*n*Log[a + b*x])/(5*b^5*h) + (B*(d*g - c*h)^5*n*Log[c + d*x])/(5*d^5*h)
+ (B*(g + h*x)^5*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(5*h)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int (g+hx)^4 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx &= \int \left(A(g+hx)^4+B(g+hx)^4\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx\\ &= \frac{A(g+hx)^5}{5h}+B\int (g+hx)^4\log \left(e(a+bx)^n(c+dx)^{-n}\right)\,dx\\ &= \frac{A(g+hx)^5}{5h}+\frac{B(g+hx)^5\log \left(e(a+bx)^n(c+dx)^{-n}\right)}{5h}-\frac{(B(bc}{}\\ &= \frac{A(g+hx)^5}{5h}+\frac{B(g+hx)^5\log \left(e(a+bx)^n(c+dx)^{-n}\right)}{5h}-\frac{(B(bc}{}\\ &= \frac{B(bc-ad)h\left(a^3d^3h^3-a^2bd^2h^2(5dg-ch)+ab^2dh\left(10d^2g^2-\right.\right.}{5l}\end{aligned}$$

Mathematica [**A**] time = 1.01, size = 463, normalized size = 1.27

$$\frac{bdx\left(Bhn(bc-ad)\left(12a^3d^3h^3-6a^2bd^2h^2(-2ch+10dg+dhx)+2ab^2dh\left(6c^2h^2-3cdh(10g+hx)+d^2\left(60g^2+15\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(12*A*b^4*d^4*(5*g^4 + 10*g^3*h*x + 10*g^2*h^2*x^2 + 5*g*h^3*x^3 + h
^4*x^4) + B*(b*c - a*d)*h*n*(12*a^3*d^3*h^3 - 6*a^2*b*d^2*h^2*(10*d*g - 2*c
*h + d*h*x) + 2*a*b^2*d*h*(6*c^2*h^2 - 3*c*d*h*(10*g + h*x) + d^2*(60*g^2 +
 15*g*h*x + 2*h^2*x^2)) - b^3*(-12*c^3*h^3 + 6*c^2*d*h^2*(10*g + h*x) - 2*c
*d^2*h*(60*g^2 + 15*g*h*x + 2*h^2*x^2) + d^3*(120*g^3 + 60*g^2*h*x + 20*g*h
^2*x^2 + 3*h^3*x^3)))) + 12*a^2*B*d^5*h*(-10*b^3*g^3 + 10*a*b^2*g^2*h - 5*a
^2*b*g*h^2 + a^3*h^3)*n*Log[a + b*x] - 12*b^4*B*(-5*a*d^5*g^4 + b*c*(5*d^4*
g^4 - 10*c*d^3*g^3*h + 10*c^2*d^2*g^2*h^2 - 5*c^3*d*g*h^3 + c^4*h^4))*n*Log
[c + d*x] + 12*b^4*B*d^5*(5*a*g^4 + b*x*(5*g^4 + 10*g^3*h*x + 10*g^2*h^2*x^
2 + 5*g*h^3*x^3 + h^4*x^4))*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(60*b^5*d^5)
```

fricas [**B**] time = 0.86, size = 805, normalized size = 2.21

$$\frac{12\,Ab^5d^5h^4x^5+3\left(20\,Ab^5d^5gh^3-\left(Bb^5cd^4-Bab^4d^5\right)h^4n\right)x^4+4\left(30\,Ab^5d^5g^2h^2-\left(5\left(Bb^5cd^4-Bab^4d^5\right)gh^3-\left(Bb\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/60*(12*A*b^5*d^5*h^4*x^5 + 3*(20*A*b^5*d^5*g*h^3 - (B*b^5*c*d^4 - B*a*b^4
*d^5)*h^4*n)*x^4 + 4*(30*A*b^5*d^5*g^2*h^2 - (5*(B*b^5*c*d^4 - B*a*b^4*d^5)
*g*h^3 - (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*h^4)*n)*x^3 + 6*(20*A*b^5*d^5*g^3*
h - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*g^2*h^2 - 5*(B*b^5*c^2*d^3 - B*a^2*b^3*
d^5)*g*h^3 + (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*h^4)*n)*x^2 + 12*(5*A*b^5*d^5*
g^4 - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*g^3*h - 10*(B*b^5*c^2*d^3 - B*a^2*b^3
*d^5)*g^2*h^2 + 5*(B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g*h^3 - (B*b^5*c^4*d - B*
a^4*b*d^5)*h^4)*n)*x + 12*(B*b^5*d^5*h^4*n*x^5 + 5*B*b^5*d^5*g*h^3*n*x^4 +
10*B*b^5*d^5*g^2*h^2*n*x^3 + 10*B*b^5*d^5*g^3*h*n*x^2 + 5*B*b^5*d^5*g^4*n*x
 + (5*B*a*b^4*d^5*g^4 - 10*B*a^2*b^3*d^5*g^3*h + 10*B*a^3*b^2*d^5*g^2*h^2 -
 5*B*a^4*b*d^5*g*h^3 + B*a^5*d^5*h^4)*n)*log(b*x + a) - 12*(B*b^5*d^5*h^4*n
*x^5 + 5*B*b^5*d^5*g*h^3*n*x^4 + 10*B*b^5*d^5*g^2*h^2*n*x^3 + 10*B*b^5*d^5*
g^3*h*n*x^2 + 5*B*b^5*d^5*g^4*n*x + (5*B*b^5*c*d^4*g^4 - 10*B*b^5*c^2*d^3*g
^3*h + 10*B*b^5*c^3*d^2*g^2*h^2 - 5*B*b^5*c^4*d*g*h^3 + B*b^5*c^5*h^4)*n)*l
```

```
og(d*x + c) + 12*(B*b^5*d^5*h^4*x^5 + 5*B*b^5*d^5*g*h^3*x^4 + 10*B*b^5*d^5*
g^2*h^2*x^3 + 10*B*b^5*d^5*g^3*h*x^2 + 5*B*b^5*d^5*g^4*x)*log(e))/(b^5*d^5)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple **[C]** time = 0.66, size = 2576, normalized size = 7.06

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] 1/5*h^4*B*ln(e)*x^5+B*ln(e)*g^4*x+h^3*A*g*x^4+2*h^2*A*g^2*x^3+2*h*A*g^3*x^2
+A*g^4*x+1/5*h^4*B*x^5*ln((b*x+a)^n)+ln((b*x+a)^n)*x*B*g^4-1/5*(h*x+g)^5*B/
h*ln((d*x+c)^n)+1/2/d^2*h^3*B*c^2*g*n*x^2-1/d*h^2*B*c*g^2*n*x^2+h^3/b^3*B*a
^3*g*n*x-2*h^2/b^2*B*a^2*g^2*n*x+2*h/b*B*a*g^3*n*x-1/d^3*h^3*B*c^3*g*n*x+2/
d^2*h^2*B*c^2*g^2*n*x-2/d*h*B*c*g^3*n*x+I*h^2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*h*B*Pi*g^3*x^2*csgn(I*(b*x+a)^n)*csgn(I
*(b*x+a)^n/((d*x+c)^n))^2+I*h*B*Pi*g^3*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))^2+I*h*B*Pi*g^3*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2+I*h*B*Pi*g^3*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2+I*h^2*B*Pi*g^2*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+
I*h^2*B*Pi*g^2*x^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*h^
2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^2-1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n
/((d*x+c)^n))-I*h*B*Pi*g^3*x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))-I*h^2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c
)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*h*B*Pi*g^3*x^2*csgn(I*e)*csgn(I*(b*x+
a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*h^3*B*Pi*g*x^4*csgn
(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*h
^3*B*Pi*g*x^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+
c)^n))-I*h^2*B*Pi*g^2*x^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)+1/5*h^4*A*x^5-2/d^3*h^2*B*ln(d*x+c)*c^3*g^2*n+2/d^2*
h*B*ln(d*x+c)*c^2*g^3*n-h^3/b^4*B*ln(-b*x-a)*a^4*g*n+2*h^2/b^3*B*ln(-b*x-a)
*a^3*g^2*n-2*h/b^2*B*ln(-b*x-a)*a^2*g^3*n+1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g^4*x*csgn(I*e)*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^4*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))^2-I*h*B*Pi*g^3*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/10
*I*h^4*B*Pi*x^5*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/10*I*h^4*B*Pi
*x^5*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/10*I*h^4*B*Pi*x^5*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/10*I*h^4*B*Pi*x^5*csg
n(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*h^3*B*Pi
*g*x^4*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*h^3*B*Pi*g*x^4*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^3-I*h^2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*h^2
*B*Pi*g^2*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*h*B*Pi*g^3*x^2*csgn(I*(b*
x+a)^n/((d*x+c)^n))^3+h^3*B*g*x^4*ln((b*x+a)^n)+2*h^2*B*g^2*x^3*ln((b*x+a)^
n)+2*h*B*g^3*x^2*ln((b*x+a)^n)+1/5/h*B*ln(d*x+c)*g^5*n+h^3*B*ln(e)*g*x^4+2*
h^2*B*ln(e)*g^2*x^3+2*h*B*ln(e)*g^3*x^2-1/d*B*ln(d*x+c)*c*g^4*n+1/b*B*ln(-b
*x-a)*a*g^4*n-1/5/d^5*h^4*B*ln(d*x+c)*c^5*n+1/5*h^4/b^5*B*ln(-b*x-a)*a^5*n-
1/10*I*h^4*B*Pi*x^5*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/10*I*h^4*B*Pi*x^5*csg
n(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n/((d*x+c)^n
```

```
))^3-1/2*I*B*Pi*g^4*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/3*h^3/b*B*a*g*n*x
^3-1/3/d*h^3*B*c*g*n*x^3-1/2*h^3/b^2*B*a^2*g*n*x^2+h^2/b*B*a*g^2*n*x^2+1/10
*h^4/b^3*B*a^3*n*x^2-1/10/d^3*h^4*B*c^3*n*x^2-1/5*h^4/b^4*B*a^4*n*x+1/5/d^4
*h^4*B*c^4*n*x+1/d^4*h^3*B*ln(d*x+c)*c^4*g*n-1/2*I*B*Pi*g^4*x*csgn(I*e)*csg
n(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*I*h^3*B*Pi*g
*x^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*h^3*B*Pi*g*x
^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/10*I*h
^4*B*Pi*x^5*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)
^n))-1/10*I*h^4*B*Pi*x^5*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)+1/2*I*h^3*B*Pi*g*x^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2+1/2*I*h^3*B*Pi*g*x^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c
)^n))^2+1/20*h^4/b*B*a*n*x^4-1/20/d*h^4*B*c*n*x^4-1/15*h^4/b^2*B*a^2*n*x^3+
1/15/d^2*h^4*B*c^2*n*x^3
```

maxima [**A**] time = 0.80, size = 671, normalized size = 1.84

$$\frac{1}{5}Bh^4x^5\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+\frac{1}{5}Ah^4x^5+Bgh^3x^4\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+Agh^3x^4+2Bg^2h^2x^3\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+2Ag^2h^2x^3+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/5*B*h^4*x^5*log((b*x + a)^n*e/(d*x + c)^n) + 1/5*A*h^4*x^5 + B*g*h^3*x^4*
log((b*x + a)^n*e/(d*x + c)^n) + A*g*h^3*x^4 + 2*B*g^2*h^2*x^3*log((b*x + a
)^n*e/(d*x + c)^n) + 2*A*g^2*h^2*x^3 + 2*B*g^3*h*x^2*log((b*x + a)^n*e/(d*x
 + c)^n) + 2*A*g^3*h*x^2 + B*g^4*x*log((b*x + a)^n*e/(d*x + c)^n) + A*g^4*x
 + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*g^4/e - 2*(a^2*e*n*log(b
*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*B*g^3
*h/e + (2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d
*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*B*g^2
*h^2/e - 1/6*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*
(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2
 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*g*h^3/e + 1/60*(12*a^5*e*n
*log(b*x + a)/b^5 - 12*c^5*e*n*log(d*x + c)/d^5 - (3*(b^4*c*d^3*e*n - a*b^3
*d^4*e*n)*x^4 - 4*(b^4*c^2*d^2*e*n - a^2*b^2*d^4*e*n)*x^3 + 6*(b^4*c^3*d*e*
n - a^3*b*d^4*e*n)*x^2 - 12*(b^4*c^4*e*n - a^4*d^4*e*n)*x)/(b^4*d^4))*B*h^4
/e
```

mupad [**B**] time = 5.13, size = 1434, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)^4*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n)),x)
```

```
[Out] x*((5*A*b*d*g^4 + 20*A*a*d*g^3*h + 20*A*b*c*g^3*h + 30*A*a*c*g^2*h^2 + 10*B
*a*d*g^3*h*n - 10*B*b*c*g^3*h*n)/(5*b*d) - ((5*a*d + 5*b*c)*((20*A*a*c*g*h^
3 + 20*A*b*d*g^3*h + 30*A*a*d*g^2*h^2 + 30*A*b*c*g^2*h^2 + 10*B*a*d*g^2*h^2
*n - 10*B*b*c*g^2*h^2*n)/(5*b*d) + ((5*a*d + 5*b*c)*((((5*A*a*d*h^4 + 5*A*b
*c*h^4 + 20*A*b*d*g*h^3 + B*a*d*h^4*n - B*b*c*h^4*n)/(5*b*d) - (A*h^4*(5*a*
d + 5*b*c))/(5*b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*h^4 + 20*A*a*d*g*h
^3 + 20*A*b*c*g*h^3 + 30*A*b*d*g^2*h^2 + 5*B*a*d*g*h^3*n - 5*B*b*c*g*h^3*n)
/(5*b*d) + (A*a*c*h^4)/(b*d)))/(5*b*d) - (a*c*((5*A*a*d*h^4 + 5*A*b*c*h^4 +
 20*A*b*d*g*h^3 + B*a*d*h^4*n - B*b*c*h^4*n)/(5*b*d) - (A*h^4*(5*a*d + 5*b*
c))/(5*b*d)))/(b*d)))/(5*b*d) + (a*c*((((5*A*a*d*h^4 + 5*A*b*c*h^4 + 20*A*b
*d*g*h^3 + B*a*d*h^4*n - B*b*c*h^4*n)/(5*b*d) - (A*h^4*(5*a*d + 5*b*c))/(5*
b*d))*(5*a*d + 5*b*c))/(5*b*d) - (5*A*a*c*h^4 + 20*A*a*d*g*h^3 + 20*A*b*c*g
```

```
*h^3 + 30*A*b*d*g^2*h^2 + 5*B*a*d*g*h^3*n - 5*B*b*c*g*h^3*n)/(5*b*d) + (A*a
*c*h^4)/(b*d)))/(b*d)) + log((e*(a + b*x)^n)/(c + d*x)^n)*((B*h^4*x^5)/5 +
B*g^4*x + 2*B*g^2*h^2*x^3 + 2*B*g^3*h*x^2 + B*g*h^3*x^4) + x^4*((5*A*a*d*h^
4 + 5*A*b*c*h^4 + 20*A*b*d*g*h^3 + B*a*d*h^4*n - B*b*c*h^4*n)/(20*b*d) - (A
*h^4*(5*a*d + 5*b*c))/(20*b*d)) - x^3*((((5*A*a*d*h^4 + 5*A*b*c*h^4 + 20*A*
b*d*g*h^3 + B*a*d*h^4*n - B*b*c*h^4*n)/(5*b*d) - (A*h^4*(5*a*d + 5*b*c))/(5
*b*d))*(5*a*d + 5*b*c))/(15*b*d) - (5*A*a*c*h^4 + 20*A*a*d*g*h^3 + 20*A*b*c
*g*h^3 + 30*A*b*d*g^2*h^2 + 5*B*a*d*g*h^3*n - 5*B*b*c*g*h^3*n)/(15*b*d) + (
A*a*c*h^4)/(3*b*d)) + x^2*((20*A*a*c*g*h^3 + 20*A*b*d*g^3*h + 30*A*a*d*g^2*
h^2 + 30*A*b*c*g^2*h^2 + 10*B*a*d*g^2*h^2*n - 10*B*b*c*g^2*h^2*n)/(10*b*d)
+ ((5*a*d + 5*b*c)*((((5*A*a*d*h^4 + 5*A*b*c*h^4 + 20*A*b*d*g*h^3 + B*a*d*h
^4*n - B*b*c*h^4*n)/(5*b*d) - (A*h^4*(5*a*d + 5*b*c))/(5*b*d))*(5*a*d + 5*b
*c))/(5*b*d) - (5*A*a*c*h^4 + 20*A*a*d*g*h^3 + 20*A*b*c*g*h^3 + 30*A*b*d*g^
2*h^2 + 5*B*a*d*g*h^3*n - 5*B*b*c*g*h^3*n)/(5*b*d) + (A*a*c*h^4)/(b*d)))/(1
0*b*d) - (a*c*((5*A*a*d*h^4 + 5*A*b*c*h^4 + 20*A*b*d*g*h^3 + B*a*d*h^4*n -
B*b*c*h^4*n)/(5*b*d) - (A*h^4*(5*a*d + 5*b*c))/(5*b*d)))/(2*b*d)) + (A*h^4*
x^5)/5 + (log(a + b*x)*((B*a^5*h^4*n)/5 + B*a*b^4*g^4*n + 2*B*a^3*b^2*g^2*h
^2*n - B*a^4*b*g*h^3*n - 2*B*a^2*b^3*g^3*h*n))/b^5 - (log(c + d*x)*(B*c^5*h
^4*n + 5*B*c*d^4*g^4*n + 10*B*c^3*d^2*g^2*h^2*n - 5*B*c^4*d*g*h^3*n - 10*B*
c^2*d^3*g^3*h*n))/(5*d^5)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**4*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.294 $\int (g+hx)^3 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right) \, dx$

Optimal. Leaf size=236

$$-\frac{Bhnx(bc-ad)\left(a^2d^2h^2-abdh(4dg-ch)+b^2\left(c^2h^2-4cdgh+6d^2g^2\right)\right)}{4b^3d^3}+\frac{(g+hx)^4\big(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h}$$

```
[Out] -1/4*B*(-a*d+b*c)*h*(a^2*d^2*h^2-a*b*d*h*(-c*h+4*d*g)+b^2*(c^2*h^2-4*c*d*g*
h+6*d^2*g^2))*n*x/b^3/d^3-1/8*B*(-a*d+b*c)*h^2*(-a*d*h-b*c*h+4*b*d*g)*n*x^2
/b^2/d^2-1/12*B*(-a*d+b*c)*h^3*n*x^3/b/d-1/4*B*(-a*h+b*g)^4*n*ln(b*x+a)/b^4
/h+1/4*B*(-c*h+d*g)^4*n*ln(d*x+c)/d^4/h+1/4*(h*x+g)^4*(A+B*ln(e*(b*x+a)^n/(
(d*x+c)^n)))/h
```

Rubi [A] time = 0.46, antiderivative size = 248, normalized size of antiderivative = 1.05, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$-\frac{Bhnx(bc-ad)\left(a^2d^2h^2-abdh(4dg-ch)+b^2\left(c^2h^2-4cdgh+6d^2g^2\right)\right)}{4b^3d^3}-\frac{Bh^2nx^2(bc-ad)(-adh-bch+4bdg)}{8b^2d^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*h*(a^2*d^2*h^2 - a*b*d*h*(4*d*g - c*h) + b^2*(6*d^2*g^2 - 4
*c*d*g*h + c^2*h^2))*n*x)/(4*b^3*d^3) - (B*(b*c - a*d)*h^2*(4*b*d*g - b*c*h
 - a*d*h)*n*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*h^3*n*x^3)/(12*b*d) + (A*(g +
 h*x)^4)/(4*h) - (B*(b*g - a*h)^4*n*Log[a + b*x])/(4*b^4*h) + (B*(d*g - c*h
)^4*n*Log[c + d*x])/(4*d^4*h) + (B*(g + h*x)^4*Log[(e*(a + b*x)^n)/(c + d*x
)^n])/(4*h)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int (g+hx)^3 \big(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\big)\,dx &= \int \big(A(g+hx)^3+B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)\big) \\ &= \frac{A(g+hx)^4}{4h}+B\int (g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,d \\ &= \frac{A(g+hx)^4}{4h}+\frac{B(g+hx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h}-\frac{(B}{} \\ &= \frac{A(g+hx)^4}{4h}+\frac{B(g+hx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h}-\frac{(B}{} \\ &= -\frac{B(bc-ad)h\big(a^2d^2h^2-abdh(4dg-ch)+b^2\big(6d^2g^2-4c}{4b^3d^3}\end{aligned}$$

Mathematica [A] time = 0.61, size = 314, normalized size = 1.33

$$\frac{bdx\big(6Ab^3d^3\left(4g^3+6g^2hx+4gh^2x^2+h^3x^3\right)-Bhn(bc-ad)\big(6a^2d^2h^2-3abdh(-2ch+8dg+dhx)+b^2\big(6c^2h^2}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(6*A*b^3*d^3*(4*g^3 + 6*g^2*h*x + 4*g*h^2*x^2 + h^3*x^3) - B*(b*c -
a*d)*h*n*(6*a^2*d^2*h^2 - 3*a*b*d*h*(8*d*g - 2*c*h + d*h*x) + b^2*(6*c^2*h^
2 - 3*c*d*h*(8*g + h*x) + 2*d^2*(18*g^2 + 6*g*h*x + h^2*x^2)))) - 6*a^2*B*d
^4*h*(6*b^2*g^2 - 4*a*b*g*h + a^2*h^2)*n*Log[a + b*x] + 6*b^3*B*(4*a*d^4*g^
3 + b*c*(-4*d^3*g^3 + 6*c*d^2*g^2*h - 4*c^2*d*g*h^2 + c^3*h^3))*n*Log[c + d
*x] + 6*b^3*B*d^4*(4*a*g^3 + b*x*(4*g^3 + 6*g^2*h*x + 4*g*h^2*x^2 + h^3*x^3
))*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(24*b^4*d^4)
```

fricas [B] time = 0.86, size = 571, normalized size = 2.42

$$\frac{6\,Ab^4d^4h^3x^4+2\left(12\,Ab^4d^4gh^2-\left(Bb^4cd^3-Bab^3d^4\right)h^3n\right)x^3+3\big(12\,Ab^4d^4g^2h-\big(4\left(Bb^4cd^3-Bab^3d^4\right)gh^2-\big(B}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/24*(6*A*b^4*d^4*h^3*x^4 + 2*(12*A*b^4*d^4*g*h^2 - (B*b^4*c*d^3 - B*a*b^3*
d^4)*h^3*n)*x^3 + 3*(12*A*b^4*d^4*g^2*h - (4*(B*b^4*c*d^3 - B*a*b^3*d^4)*g*
h^2 - (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*h^3)*n)*x^2 + 6*(4*A*b^4*d^4*g^3 - (6
*(B*b^4*c*d^3 - B*a*b^3*d^4)*g^2*h - 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g*h^
2 + (B*b^4*c^3*d - B*a^3*b*d^4)*h^3)*n)*x + 6*(B*b^4*d^4*h^3*n*x^4 + 4*B*b^
4*d^4*g*h^2*n*x^3 + 6*B*b^4*d^4*g^2*h*n*x^2 + 4*B*b^4*d^4*g^3*n*x + (4*B*a*
b^3*d^4*g^3 - 6*B*a^2*b^2*d^4*g^2*h + 4*B*a^3*b*d^4*g*h^2 - B*a^4*d^4*h^3)*
n)*log(b*x + a) - 6*(B*b^4*d^4*h^3*n*x^4 + 4*B*b^4*d^4*g*h^2*n*x^3 + 6*B*b^
4*d^4*g^2*h*n*x^2 + 4*B*b^4*d^4*g^3*n*x + (4*B*b^4*c*d^3*g^3 - 6*B*b^4*c^2*
d^2*g^2*h + 4*B*b^4*c^3*d*g*h^2 - B*b^4*c^4*h^3)*n)*log(d*x + c) + 6*(B*b^4
*d^4*h^3*x^4 + 4*B*b^4*d^4*g*h^2*x^3 + 6*B*b^4*d^4*g^2*h*x^2 + 4*B*b^4*d^4*
g^3*x)*log(e))/(b^4*d^4)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.57, size = 1967, normalized size = 8.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] ln((b*x+a)^n)*x*B*g^3-1/4*(h*x+g)^4*B/h*ln((d*x+c)^n)+1/4/h*B*ln(-d*x-c)*g^
4*n+h^2*B*g*x^3*ln((b*x+a)^n)+3/2*h*B*g^2*x^2*ln((b*x+a)^n)+h^2*B*ln(e)*g*x
^3+3/2*h*B*ln(e)*g^2*x^2+B*ln(e)*g^3*x+1/4*h^3*B*x^4*ln((b*x+a)^n)+1/4*h^3*
B*ln(e)*x^4+3/4*I*h*B*Pi*g^2*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^
2+3/4*I*h*B*Pi*g^2*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/
2*I*h^2*B*Pi*g*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3/4*I*h*B*Pi
*g^2*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+3/4*I*h*B*Pi*g
^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/8*
I*h^3*B*Pi*x^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)-1/8*I*h^3*B*Pi*x^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))+1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*x+a)^n)*cs
gn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*h^2*B*Pi*g*x^3*csgn(I/((d*x+c)^n))*csgn
(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I*B*Pi*g^3*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d
*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*g^3*x*csgn(I*(b*x+a)^n
)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/12*h^3/b*B*a*n*x^3-1/
12/d*h^3*B*c*n*x^3-1/8*h^3/b^2*B*a^2*n*x^2+1/8/d^2*h^3*B*c^2*n*x^2+1/4*h^3/
b^3*B*a^3*n*x+h^2*A*g*x^3+3/2*h*A*g^2*x^2+A*g^3*x+1/4/d^4*h^3*B*ln(-d*x-c)*
c^4*n-1/4*h^3/b^4*B*ln(b*x+a)*a^4*n-1/d*B*ln(-d*x-c)*c*g^3*n+1/b*B*ln(b*x+a
)*a*g^3*n-1/2*I*B*Pi*g^3*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*g^3*x
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/8*I*h^3*B*Pi*x^4*csgn(I*(b*x+a)^n/((d*
x+c)^n))^3-1/8*I*h^3*B*Pi*x^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/4*h^3*A*x
^4-3/4*I*h*B*Pi*g^2*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)-1/2*I*h^2*B*Pi*g*x^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+
c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-3/4*I*h*B*Pi*g^2*x^2*csgn(I*(b*x+a)^
n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*h^2*B*Pi*g*x^3*c
sgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/4/d^3*
h^3*B*c^3*n*x-1/d^3*h^2*B*ln(-d*x-c)*c^3*g*n+3/2/d^2*h*B*ln(-d*x-c)*c^2*g^2
*n+h^2/b^3*B*ln(b*x+a)*a^3*g*n-3/2*h/b^2*B*ln(b*x+a)*a^2*g^2*n-3/4*I*h*B*Pi
*g^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-3/4*I*h*B*Pi*g^2*x^2*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^3+1/8*I*h^3*B*Pi*x^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^
n/((d*x+c)^n))^2+1/8*I*h^3*B*Pi*x^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))
^3-1/2*I*h^2*B*Pi*g*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/8*I*h^3*B*Pi*x^
4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g^3*x*csgn(I
*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g^3*x*csgn(I*e)*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^3*x*csgn(I*(b*x+a)^n/((d*x+c)^n)
)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^3*x*csgn(I/((d*x+c)^n))*cs
gn(I*(b*x+a)^n/((d*x+c)^n))^2+1/8*I*h^3*B*Pi*x^4*csgn(I*e)*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^2+1/2*h^2/b*B*a*g*n*x^2-1/2/d*h^2*B*c*g*n*x^2-h^2/b^2*B*a^2
*g*n*x+3/2*h/b*B*a*g^2*n*x+1/d^2*h^2*B*c^2*g*n*x-3/2/d*h*B*c*g^2*n*x
```

maxima [B] time = 0.66, size = 467, normalized size = 1.98

$$\frac{1}{4}\,Bh^{3}x^{4}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+\frac{1}{4}\,Ah^{3}x^{4}+Bgh^{2}x^{3}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+Agh^{2}x^{3}+\frac{3}{2}\,Bg^{2}hx^{2}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+\frac{3}{2}\,Ag^{2}hx^{2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/4*B*h^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A*h^3*x^4 + B*g*h^2*x^3*
log((b*x + a)^n*e/(d*x + c)^n) + A*g*h^2*x^3 + 3/2*B*g^2*h*x^2*log((b*x + a
)^n*e/(d*x + c)^n) + 3/2*A*g^2*h*x^2 + B*g^3*x*log((b*x + a)^n*e/(d*x + c)^
n) + A*g^3*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*g^3/e - 3/2*
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*g^2*h/e + 1/2*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x +
c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x
)/(b^2*d^2))*B*g*h^2/e - 1/24*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d
*x + c)/d^4 + (2*(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a
^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*h^3/e
```

mupad **[B]** time = 4.76, size = 767, normalized size = 3.25

$$x\left(\frac{4\,A\,b\,d\,g^3+12\,A\,a\,c\,g\,h^2+12\,A\,a\,d\,g^2\,h+12\,A\,b\,c\,g^2\,h+6\,B\,a\,d\,g^2\,h\,n-6\,B\,b\,c\,g^2\,h\,n}{4\,b\,d}+\frac{(4\,a\,d+4\,b\,c)\left(\left(\frac{4\,A}{}\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)^3*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n)),x)
```

```
[Out] x*((4*A*b*d*g^3 + 12*A*a*c*g*h^2 + 12*A*a*d*g^2*h + 12*A*b*c*g^2*h + 6*B*a*
d*g^2*h*n - 6*B*b*c*g^2*h*n)/(4*b*d) + ((4*a*d + 4*b*c)*((((4*A*a*d*h^3 + 4
*A*b*c*h^3 + 12*A*b*d*g*h^2 + B*a*d*h^3*n - B*b*c*h^3*n)/(4*b*d) - (A*h^3*(
4*a*d + 4*b*c))/(4*b*d))*(4*a*d + 4*b*c))/(4*b*d) - (4*A*a*c*h^3 + 12*A*a*d
*g*h^2 + 12*A*b*c*g*h^2 + 12*A*b*d*g^2*h + 4*B*a*d*g*h^2*n - 4*B*b*c*g*h^2*
n)/(4*b*d) + (A*a*c*h^3)/(b*d)))/(4*b*d) - (a*c*((4*A*a*d*h^3 + 4*A*b*c*h^3
 + 12*A*b*d*g*h^2 + B*a*d*h^3*n - B*b*c*h^3*n)/(4*b*d) - (A*h^3*(4*a*d + 4*
b*c))/(4*b*d)))/(b*d)) + log((e*(a + b*x)^n)/(c + d*x)^n)*((B*h^3*x^4)/4 +
B*g^3*x + (3*B*g^2*h*x^2)/2 + B*g*h^2*x^3) - x^2*((((4*A*a*d*h^3 + 4*A*b*c*
h^3 + 12*A*b*d*g*h^2 + B*a*d*h^3*n - B*b*c*h^3*n)/(4*b*d) - (A*h^3*(4*a*d +
 4*b*c))/(4*b*d))*(4*a*d + 4*b*c))/(8*b*d) - (4*A*a*c*h^3 + 12*A*a*d*g*h^2
+ 12*A*b*c*g*h^2 + 12*A*b*d*g^2*h + 4*B*a*d*g*h^2*n - 4*B*b*c*g*h^2*n)/(8*b
*d) + (A*a*c*h^3)/(2*b*d)) + x^3*((4*A*a*d*h^3 + 4*A*b*c*h^3 + 12*A*b*d*g*h
^2 + B*a*d*h^3*n - B*b*c*h^3*n)/(12*b*d) - (A*h^3*(4*a*d + 4*b*c))/(12*b*d)
) + (A*h^3*x^4)/4 - (log(a + b*x)*(B*a^4*h^3*n - 4*B*a*b^3*g^3*n - 4*B*a^3*
b*g*h^2*n + 6*B*a^2*b^2*g^2*h*n))/(4*b^4) + (log(c + d*x)*(B*c^4*h^3*n - 4*
B*c*d^3*g^3*n - 4*B*c^3*d*g*h^2*n + 6*B*c^2*d^2*g^2*h*n))/(4*d^4)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.295 $\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$

Optimal. Leaf size=158

$$\frac{(g+hx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{3h}-\frac{Bn(bg-ah)^3\log(a+bx)}{3b^3h}-\frac{Bhnx(bc-ad)(-adh-bch+3bdg)}{3b^2d^2}-Bh$$

```
[Out] -1/3*B*(-a*d+b*c)*h*(-a*d*h-b*c*h+3*b*d*g)*n*x/b^2/d^2-1/6*B*(-a*d+b*c)*h^2
*n*x^2/b/d-1/3*B*(-a*h+b*g)^3*n*ln(b*x+a)/b^3/h+1/3*B*(-c*h+d*g)^3*n*ln(d*x
+c)/d^3/h+1/3*(h*x+g)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/h
```

Rubi [A] time = 0.24, antiderivative size = 170, normalized size of antiderivative = 1.08, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$-\frac{Bhnx(bc-ad)(-adh-bch+3bdg)}{3b^2d^2}-\frac{Bn(bg-ah)^3\log(a+bx)}{3b^3h}+\frac{B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h}-\frac{Bh^2nx^2(}{6b}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*h^2*n*x^2)/(6*b*d) + (A*(g + h*x)^3)/(3*h) - (B*(b*g - a*h)^3*n*Log[a +
b*x])/(3*b^3*h) + (B*(d*g - c*h)^3*n*Log[c + d*x])/(3*d^3*h) + (B*(g + h*x)
^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*h)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int (g+hx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx &= \int \left(A(g+hx)^2+B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) \\ &= \frac{A(g+hx)^3}{3h}+B\int (g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,d \\ &= \frac{A(g+hx)^3}{3h}+\frac{B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h}-\frac{(B}{} \\ &= \frac{A(g+hx)^3}{3h}+\frac{B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h}-\frac{(B}{} \\ &= -\frac{B(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}-\frac{B(bc-ad)h^2nx^2}{6bd}+\end{aligned}$$

Mathematica [**A**] time = 0.39, size = 204, normalized size = 1.29

$$2a^2Bd^3hn(ah-3bg)\log(a+bx)+b\left(dx\left(Bhn(bc-ad)(2adh+2bch-6bdg-bdhx)+2Ab^2d^2\left(3g^2+3ghx+\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (2*a^2*B*d^3*h*(-3*b*g + a*h)*n*Log[a + b*x] + b*(d*x*(B*(b*c - a*d)*h*n*(-
6*b*d*g + 2*b*c*h + 2*a*d*h - b*d*h*x) + 2*A*b^2*d^2*(3*g^2 + 3*g*h*x + h^2
*x^2)) - 2*b*B*(-3*a*d^3*g^2 + b*c*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n*Log
[c + d*x] + 2*b*B*d^3*(3*a*g^2 + b*x*(3*g^2 + 3*g*h*x + h^2*x^2))*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]))/(6*b^3*d^3)
```

fricas [**B**] time = 0.93, size = 365, normalized size = 2.31

$$2\,Ab^3d^3h^2x^3+\left(6\,Ab^3d^3gh-\left(Bb^3cd^2-Bab^2d^3\right)h^2n\right)x^2+2\left(3\,Ab^3d^3g^2-\left(3\left(Bb^3cd^2-Bab^2d^3\right)gh-\left(Bb^3c^2d-\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/6*(2*A*b^3*d^3*h^2*x^3 + (6*A*b^3*d^3*g*h - (B*b^3*c*d^2 - B*a*b^2*d^3)*h
^2*n)*x^2 + 2*(3*A*b^3*d^3*g^2 - (3*(B*b^3*c*d^2 - B*a*b^2*d^3)*g*h - (B*b^
3*c^2*d - B*a^2*b*d^3)*h^2)*n)*x + 2*(B*b^3*d^3*h^2*n*x^3 + 3*B*b^3*d^3*g*h
*n*x^2 + 3*B*b^3*d^3*g^2*n*x + (3*B*a*b^2*d^3*g^2 - 3*B*a^2*b*d^3*g*h + B*a
^3*d^3*h^2)*n)*log(b*x + a) - 2*(B*b^3*d^3*h^2*n*x^3 + 3*B*b^3*d^3*g*h*n*x^
2 + 3*B*b^3*d^3*g^2*n*x + (3*B*b^3*c*d^2*g^2 - 3*B*b^3*c^2*d*g*h + B*b^3*c^
3*h^2)*n)*log(d*x + c) + 2*(B*b^3*d^3*h^2*x^3 + 3*B*b^3*d^3*g*h*x^2 + 3*B*b
^3*d^3*g^2*x)*log(e))/(b^3*d^3)
```

giac [**B**] time = 97.81, size = 298, normalized size = 1.89

$$\frac{1}{3}\left(Ah^2+Bh^2\right)x^3+\frac{1}{3}\left(Bh^2nx^3+3\,Bghnx^2+3\,Bg^2nx\right)\log(bx+a)-\frac{1}{3}\left(Bh^2nx^3+3\,Bghnx^2+3\,Bg^2nx\right)\log(dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/3*(A*h^2 + B*h^2)*x^3 + 1/3*(B*h^2*n*x^3 + 3*B*g*h*n*x^2 + 3*B*g^2*n*x)*l
og(b*x + a) - 1/3*(B*h^2*n*x^3 + 3*B*g*h*n*x^2 + 3*B*g^2*n*x)*log(d*x + c)
```

```
- 1/6*(B*b*c*h^2*n - B*a*d*h^2*n - 6*A*b*d*g*h - 6*B*b*d*g*h)*x^2/(b*d) + 1
/3*(3*B*a*b^2*g^2*n - 3*B*a^2*b*g*h*n + B*a^3*h^2*n)*log(b*x + a)/b^3 - 1/3
*(3*B*c*d^2*g^2*n - 3*B*c^2*d*g*h*n + B*c^3*h^2*n)*log(-d*x - c)/d^3 - 1/3*
(3*B*b^2*c*d*g*h*n - 3*B*a*b*d^2*g*h*n - B*b^2*c^2*h^2*n + B*a^2*d^2*h^2*n
- 3*A*b^2*d^2*g^2 - 3*B*b^2*d^2*g^2)*x/(b^2*d^2)
```

maple [C] time = 0.51, size = 1389, normalized size = 8.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/3*(h*x+g)^3*B/h*ln((d*x+c)^n)+h/b*B*a*g*n*x-1/d*h*B*c*g*n*x+ln((b*x+a)^n
)*x*B*g^2+1/3*h^2*B*ln(e)*x^3+1/3*h^2*B*x^3*ln((b*x+a)^n)+B*ln(e)*g^2*x-1/3
*h^2/b^2*B*a^2*n*x+1/3/d^2*h^2*B*c^2*n*x+1/d^2*h*B*ln(d*x+c)*c^2*g*n-h/b^2*
B*ln(-b*x-a)*a^2*g*n+1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((
d*x+c)^n))^2+1/2*I*B*Pi*g^2*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)
^n))^2+1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)^2+1/2*I*B*Pi*g^2*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1
/6*I*h^2*B*Pi*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/6*I*h
^2*B*Pi*x^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/6*I*h^2*B
*Pi*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
-1/6*I*h^2*B*Pi*x^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)-1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*B*Pi*g^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*
x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^
n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*h*B*Pi*g*x^2*csgn(I/((d*x+c)^n))*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*h*B*Pi*g*x^2*csgn(I*e)*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^2+1/3*h^2*A*x^3+1/3/h*B*ln(d*x+c)*g^3*n+h*B*ln(e)*
g*x^2+h*B*g*x^2*ln((b*x+a)^n)+1/6*I*h^2*B*Pi*x^3*csgn(I*(b*x+a)^n/((d*x+c)^
n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/6*I*h^2*B*Pi*x^3*csgn(I*e)*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^
3-1/2*I*h*B*Pi*g*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+h*A*g*x^2+A*g^2*x-1/
6/d*h^2*B*c*n*x^2-1/d*B*ln(d*x+c)*c*g^2*n+1/b*B*ln(-b*x-a)*a*g^2*n-1/3/d^3*
h^2*B*ln(d*x+c)*c^3*n+1/3*h^2/b^3*B*ln(-b*x-a)*a^3*n-1/6*I*h^2*B*Pi*x^3*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3-1/6*I*h^2*B*Pi*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^3-1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*g^2*x*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^n)*csgn(I
/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*h*B*Pi*g*x^2*csgn(I*e)*cs
gn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/6*h^2/b*B*a*n
*x^2
```

maxima [A] time = 0.94, size = 294, normalized size = 1.86

$$\frac{1}{3}Bh^2x^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{3}Ah^2x^3+Bghx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aghx^2+Bg^2x\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Ag^2x+\frac{\left(\frac{aen\log(bx+a}{b}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/3*B*h^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A*h^2*x^3 + B*g*h*x^2*lo
g((b*x + a)^n*e/(d*x + c)^n) + A*g*h*x^2 + B*g^2*x*log((b*x + a)^n*e/(d*x +
 c)^n) + A*g^2*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*g^2/e -
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*g*h/e + 1/6*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)
```

```
/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/
(b^2*d^2))*B*h^2/e
```

mupad [**B**]   time = 4.47, size = 372, normalized size = 2.35

$$x^2\left(\frac{3\,A\,a\,d\,h^2+3\,A\,b\,c\,h^2+6\,A\,b\,d\,g\,h+B\,a\,d\,h^2\,n-B\,b\,c\,h^2\,n}{6\,b\,d}-\frac{A\,h^2\,\left(3\,a\,d+3\,b\,c\right)}{6\,b\,d}\right)+\ln\left(\frac{e\,\left(a+b\,x\right)^n}{\left(c+d\,x\right)^n}\right)\,\left(B\,g^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n)),x)
```

```
[Out] x^2*((3*A*a*d*h^2 + 3*A*b*c*h^2 + 6*A*b*d*g*h + B*a*d*h^2*n - B*b*c*h^2*n)/
(6*b*d) - (A*h^2*(3*a*d + 3*b*c))/(6*b*d)) + log((e*(a + b*x)^n)/(c + d*x)^
n)*((B*h^2*x^3)/3 + B*g^2*x + B*g*h*x^2) - x*(((3*a*d + 3*b*c)*((3*A*a*d*h^
2 + 3*A*b*c*h^2 + 6*A*b*d*g*h + B*a*d*h^2*n - B*b*c*h^2*n)/(3*b*d) - (A*h^2
*(3*a*d + 3*b*c))/(3*b*d)))/(3*b*d) - (3*A*a*c*h^2 + 3*A*b*d*g^2 + 6*A*a*d*
g*h + 6*A*b*c*g*h + 3*B*a*d*g*h*n - 3*B*b*c*g*h*n)/(3*b*d) + (A*a*c*h^2)/(b
*d)) + (A*h^2*x^3)/3 + (log(a + b*x)*(B*a^3*h^2*n + 3*B*a*b^2*g^2*n - 3*B*a
^2*b*g*h*n))/(3*b^3) - (log(c + d*x)*(B*c^3*h^2*n + 3*B*c*d^2*g^2*n - 3*B*c
^2*d*g*h*n))/(3*d^3)
```

sympy [**F(-2)**]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.296 $\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=116

$$\frac{(g+hx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{2h}-\frac{Bn(bg-ah)^2\log(a+bx)}{2b^2h}-\frac{Bhnx(bc-ad)}{2bd}+\frac{Bn(dg-ch)^2\log(c+d}{2d^2h}$$

```
[Out] -1/2*B*(-a*d+b*c)*h*n*x/b/d-1/2*B*(-a*h+b*g)^2*n*ln(b*x+a)/b^2/h+1/2*B*(-c*
h+d*g)^2*n*ln(d*x+c)/d^2/h+1/2*(h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/
h
```

Rubi [A] time = 0.15, antiderivative size = 128, normalized size of antiderivative = 1.10, number of steps used = 5, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$, Rules used = {6742, 2492, 72}

$$-\frac{Bn(bg-ah)^2\log(a+bx)}{2b^2h}+\frac{B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h}-\frac{Bhnx(bc-ad)}{2bd}+\frac{A(g+hx)^2}{2h}+\frac{Bn(dg-ch)^2\,\mathrm{lo}}{2d^2h}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*h*n*x)/(2*b*d) + (A*(g + h*x)^2)/(2*h) - (B*(b*g - a*h)^2*n
*Log[a + b*x])/(2*b^2*h) + (B*(d*g - c*h)^2*n*Log[c + d*x])/(2*d^2*h) + (B*
(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx &= \int \left(A(g+hx)+B(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx\\ &= \frac{A(g+hx)^2}{2h}+B\int (g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx\\ &= \frac{A(g+hx)^2}{2h}+\frac{B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h}-\frac{(B(}{}\\ &= \frac{A(g+hx)^2}{2h}+\frac{B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h}-\frac{(B(}{}\\ &= -\frac{B(bc-ad)hnx}{2bd}+\frac{A(g+hx)^2}{2h}-\frac{B(bg-ah)^2n\log(a+bx}{2b^2h}\end{aligned}$$

Mathematica [A] time = 0.19, size = 124, normalized size = 1.07

$$\frac{-a^2Bd^2hn\log(a+bx)+bd\left(x(Bhn(ad-bc)+Abd(2g+hx))+Bd(2ag+bx(2g+hx))\log\left(e(a+bx)^n(c+dx\right.\right.}{2b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (-(a^2*B*d^2*h*n*Log[a + b*x]) + b*B*(2*a*d^2*g + b*c*(-2*d*g + c*h))*n*Log
[c + d*x] + b*d*(x*(B*(-(b*c) + a*d)*h*n + A*b*d*(2*g + h*x)) + B*d*(2*a*g
+ b*x*(2*g + h*x))*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*b^2*d^2)
```

fricas [A] time = 0.81, size = 192, normalized size = 1.66

$$\frac{Ab^2d^2hx^2+\left(2\,Ab^2d^2g-\left(Bb^2cd-Babd^2\right)hn\right)x+\left(Bb^2d^2hnx^2+2\,Bb^2d^2gnx+\left(2\,Babd^2g-Ba^2d^2h\right)n\right)\log(bx}{2\,b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*h*x^2 + (2*A*b^2*d^2*g - (B*b^2*c*d - B*a*b*d^2)*h*n)*x + (B
*b^2*d^2*h*n*x^2 + 2*B*b^2*d^2*g*n*x + (2*B*a*b*d^2*g - B*a^2*d^2*h)*n)*log
(b*x + a) - (B*b^2*d^2*h*n*x^2 + 2*B*b^2*d^2*g*n*x + (2*B*b^2*c*d*g - B*b^2
*c^2*h)*n)*log(d*x + c) + (B*b^2*d^2*h*x^2 + 2*B*b^2*d^2*g*x)*log(e))/(b^2*
d^2)
```

giac [A] time = 7.10, size = 149, normalized size = 1.28

$$\frac{1}{2}\,(Ah+Bh)x^2+\frac{1}{2}\left(Bhnx^2+2\,Bgnx\right)\log(bx+a)-\frac{1}{2}\left(Bhnx^2+2\,Bgnx\right)\log(dx+c)-\frac{\left(Bbchn-Badhn-2\,Aba\right.}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/2*(A*h + B*h)*x^2 + 1/2*(B*h*n*x^2 + 2*B*g*n*x)*log(b*x + a) - 1/2*(B*h*n
*x^2 + 2*B*g*n*x)*log(d*x + c) - 1/2*(B*b*c*h*n - B*a*d*h*n - 2*A*b*d*g - 2
*B*b*d*g)*x/(b*d) + 1/2*(2*B*a*b*g*n - B*a^2*h*n)*log(b*x + a)/b^2 - 1/2*(2
*B*c*d*g*n - B*c^2*h*n)*log(-d*x - c)/d^2
```

maple [C] time = 0.45, size = 839, normalized size = 7.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] 1/2*A*h*x^2+A*g*x-1/2*B*x*(h*x+2*g)*ln((d*x+c)^n)+1/2*ln((b*x+a)^n)*x^2*B*h
+ln((b*x+a)^n)*x*B*g+1/2*B*ln(e)*h*x^2+B*ln(e)*g*x+1/4*I*B*Pi*h*x^2*csgn(I*
(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/4*I*B*Pi*h*x^2*csgn(I/((d*x+c)
^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2/b^2*B*ln(b*x+a)*a^2*h*n+1/b*B*ln(b
*x+a)*a*g*n+1/2/d^2*B*ln(-d*x-c)*c^2*h*n-1/d*B*ln(-d*x-c)*c*g*n-1/4*I*B*Pi*
h*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/4*I*B*Pi*h*x^2*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^3-1/2*I*B*Pi*g*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*g
*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2/d*B*c*h*n*x+1/2*I*B*Pi*g*x*csgn(I*e)
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g*x*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g*x*csgn(I*(b*x+a)^n)*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x
+a)^n/((d*x+c)^n))^2+1/4*I*B*Pi*h*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^2+1/4*I*B*Pi*h*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)^2-1/2*I*B*Pi*g*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*g*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n
))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/4*I*B*Pi*h*x^2*csgn(I*e)*csgn(I*(b*x+a)^
n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/4*I*B*Pi*h*x^2*csgn(I*(b*x
+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/2/b*B*a*h*n*x
```

maxima [A] time = 0.62, size = 154, normalized size = 1.33

$$\frac{1}{2}\,Bhx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{2}\,Ahx^2+Bgx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Agx+\frac{\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)Bg}{e}-\frac{\left(\frac{a^2en\log(bx+a)}{b^2}-\frac{c^2}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima")
```

```
[Out] 1/2*B*h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A*h*x^2 + B*g*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A*g*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d
)*B*g/e - 1/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e
*n - a*d*e*n)*x/(b*d))*B*h/e
```

mupad [B] time = 4.39, size = 154, normalized size = 1.33

$$\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\left(\frac{B\,h\,x^2}{2}+B\,g\,x\right)+x\left(\frac{2\,A\,a\,d\,h+2\,A\,b\,c\,h+2\,A\,b\,d\,g+B\,a\,d\,h\,n-B\,b\,c\,h\,n}{2\,b\,d}-\frac{A\,h\,(2\,a\,d+2\,b\,c)}{2\,b\,d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n)),x)
```

```
[Out] log((e*(a + b*x)^n)/(c + d*x)^n)*(B*g*x + (B*h*x^2)/2) + x*((2*A*a*d*h + 2*
A*b*c*h + 2*A*b*d*g + B*a*d*h*n - B*b*c*h*n)/(2*b*d) - (A*h*(2*a*d + 2*b*c)
)/(2*b*d)) - (log(a + b*x)*(B*a^2*h*n - 2*B*a*b*g*n))/(2*b^2) + (log(c + d*
x)*(B*c^2*h*n - 2*B*c*d*g*n))/(2*d^2) + (A*h*x^2)/2
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.297 $\int \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=57

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x-B*(-a*d+b*c)*n*ln(d*x+c)/b/d+B*(b*x+a)*ln(e*(b*x+a)^n/((d*x+c)^n))/b
```

Rubi [A] time = 0.03, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n],x]
```

```
[Out] A*x - (B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (B*(a + b*x)*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rubi steps

$$\begin{aligned}\int \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx &= Ax+B\int \log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx\\ &= Ax+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{(B(bc-ad)n)\int \frac{1}{c+dx}}{b}\\ &= Ax-\frac{B(bc-ad)n\log(c+dx)}{bd}+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)\right.}{b}\end{aligned}$$

Mathematica [A] time = 0.01, size = 57, normalized size = 1.00

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n],x]
```

```
[Out] A*x - (B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (B*(a + b*x)*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b
```

fricas [A] time = 0.90, size = 59, normalized size = 1.04

$$\frac{Bbdx\log(e)+Abdx+(Bbdnx+Badn)\log(bx+a)-(Bbdnx+Bbcn)\log(dx+c)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm="fricas")
```

```
[Out] (B*b*d*x*log(e) + A*b*d*x + (B*b*d*n*x + B*a*d*n)*log(b*x + a) - (B*b*d*n*x
 + B*b*c*n)*log(d*x + c))/(b*d)
```

giac [**A**] time = 0.20, size = 55, normalized size = 0.96

$$\left(nx\log\left(bx+a\right)-nx\log\left(dx+c\right)+\frac{an\log\left(bx+a\right)}{b}-\frac{cn\log\left(-dx-c\right)}{d}+x\right)B+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm="giac")
```

```
[Out] (n*x*log(b*x + a) - n*x*log(d*x + c) + a*n*log(b*x + a)/b - c*n*log(-d*x -
c)/d + x)*B + A*x
```

maple [**B**] time = 0.05, size = 123, normalized size = 2.16

$$\frac{B\,a^{2}dn\ln\left(bx+a\right)}{\left(ad-bc\right)b}-\frac{Bacn\ln\left(bx+a\right)}{ad-bc}-\frac{Bacn\ln\left(dx+c\right)}{ad-bc}+\frac{Bb\,c^{2}n\ln\left(dx+c\right)}{\left(ad-bc\right)d}+Bx\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)),x)
```

```
[Out] A*x+B*x*ln(e*(b*x+a)^n/((d*x+c)^n))-1/(a*d-b*c)*B*a*c*n*ln(d*x+c)+1/(a*d-b*
c)*B*b*c^2/d*n*ln(d*x+c)+1/(a*d-b*c)*B*a^2/b*d*n*ln(b*x+a)-1/(a*d-b*c)*B*a*
c*n*ln(b*x+a)
```

maxima [**A**] time = 0.82, size = 59, normalized size = 1.04

$$Bx\log\left(\frac{\left(bx+a\right)^{n}e}{\left(dx+c\right)^{n}}\right)+Ax+\frac{\left(\frac{aen\log\left(bx+a\right)}{b}-\frac{cen\log\left(dx+c\right)}{d}\right)B}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm="maxima")
```

```
[Out] B*x*log((b*x + a)^n*e/(d*x + c)^n) + A*x + (a*e*n*log(b*x + a)/b - c*e*n*lo
g(d*x + c)/d)*B/e
```

mupad [**B**] time = 4.11, size = 53, normalized size = 0.93

$$A\,x+B\,x\,\ln\left(\frac{e\,\left(a+b\,x\right)^{n}}{\left(c+d\,x\right)^{n}}\right)+\frac{B\,a\,n\,\ln\left(a+b\,x\right)}{b}-\frac{B\,c\,n\,\ln\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A + B*log((e*(a + b*x)^n)/(c + d*x)^n),x)
```

```
[Out] A*x + B*x*log((e*(a + b*x)^n)/(c + d*x)^n) + (B*a*n*log(a + b*x))/b - (B*c*
n*log(c + d*x))/d
```

sympy [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.298 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{g+hx}\,dx$

<u>**Optimal**</u>. Leaf size=148

$$\frac{\log(g+hx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h}-\frac{Bn\text{Li}_2\left(\frac{b(g+hx)}{bg-ah}\right)}{h}-\frac{Bn\log(g+hx)\log\left(-\frac{h(a+bx)}{bg-ah}\right)}{h}+\frac{Bn\text{Li}_2\left(\frac{d(g+h}{dg-c}\right.}{h}$$

```
[Out] -B*n*ln(-h*(b*x+a)/(-a*h+b*g))*ln(h*x+g)/h+B*n*ln(-h*(d*x+c)/(-c*h+d*g))*ln
(h*x+g)/h+(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(h*x+g)/h-B*n*polylog(2,b*(h*
x+g)/(-a*h+b*g))/h+B*n*polylog(2,d*(h*x+g)/(-c*h+d*g))/h
```

<u>**Rubi**</u> [A] time = 0.19, antiderivative size = 156, normalized size of antiderivative = 1.05, number of steps used = 9, number of rules used = 5, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {6742, 2494, 2394, 2393, 2391}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(g+hx)}{bg-ah}\right)}{h}+\frac{Bn\text{PolyLog}\left(2,\frac{d(g+hx)}{dg-ch}\right)}{h}+\frac{B\log(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}-\frac{Bn\log(g+hx)}{h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x),x]
```

```
[Out] (A*Log[g + h*x])/h - (B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g + h*x])/h
 + (B*n*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/h + (B*Log[(e*(a +
b*x)^n)/(c + d*x)^n]*Log[g + h*x])/h - (B*n*PolyLog[2, (b*(g + h*x))/(b*g -
 a*h)])/h + (B*n*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/h
```

<u>Rule 2391</u>

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

<u>Rule 2393</u>

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

<u>Rule 2394</u>

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

<u>Rule 2494</u>

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

<u>Rule 6742</u>

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\,dx &= \int\left(\frac{A}{g+hx}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\right)dx\\ &= \frac{A\log(g+hx)}{h}+B\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\,dx\\ &= \frac{A\log(g+hx)}{h}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log(g+hx)}{h}-\frac{(bBn)\int}{h}\\ &= \frac{A\log(g+hx)}{h}-\frac{Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)}{h}+\frac{Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log}{h}\\ &= \frac{A\log(g+hx)}{h}-\frac{Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)}{h}+\frac{Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log}{h}\\ &= \frac{A\log(g+hx)}{h}-\frac{Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)}{h}+\frac{Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log}{h}\end{aligned}$$

Mathematica [A] time = 0.11, size = 150, normalized size = 1.01

$$\frac{\log(g+hx)\left(B\left(\log\left(e(a+bx)^n(c+dx)^{-n}\right)-n\log(a+bx)+n\log(c+dx)\right)+A\right)+Bn\left(\text{Li}_2\left(\frac{h(a+bx)}{ah-bg}\right)+\log(a+b\right.}{h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x),x]
```

```
[Out] ((A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)
^n]))*Log[g + h*x] + B*n*(Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] + Pol
yLog[2, (h*(a + b*x))/(-(b*g) + a*h)]) - B*n*(Log[c + d*x]*Log[(d*(g + h*x)
)/(d*g - c*h)] + PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)]))/h
```

fricas [F] time = 0.97, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{hx+g}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(h*x + g), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(h*x + g), x)
```

maple [C] time = 0.45, size = 597, normalized size = 4.03

$$-\frac{i\pi B \operatorname{csgn}(ie) \operatorname{csgn}\left(i(bx+a)^n (dx+c)^{-n}\right) \operatorname{csgn}\left(ie(bx+a)^n (dx+c)^{-n}\right) \ln\left(hx+g\right)}{2h} + \frac{i\pi B \operatorname{csgn}(ie) \operatorname{csgn}(ie(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x)
```

```
[Out] -1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*ln(h*x+g)/h
*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^
n)+1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n
)*(b*x+a)^n)^2+1/2*I*ln(h*x+g)/h*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))^2-1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I
*ln(h*x+g)/h*B*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*ln(h*x+
g)/h*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I*ln(h*x+g)
/h*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
+ln(h*x+g)/h*B*ln(e)+A*ln(h*x+g)/h+B*ln(h*x+g)/h*ln((b*x+a)^n)-B/h*n*dilog(
(b*(h*x+g)+a*h-b*g)/(a*h-b*g))-B/h*n*ln(h*x+g)*ln((b*(h*x+g)+a*h-b*g)/(a*h-
b*g))-B*ln(h*x+g)/h*ln((d*x+c)^n)+B/h*n*dilog(((h*x+g)*d+c*h-d*g)/(c*h-d*g)
)+B/h*n*ln(h*x+g)*ln(((h*x+g)*d+c*h-d*g)/(c*h-d*g))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-B\int -\frac{\log\left((bx+a)^n\right) - \log\left((dx+c)^n\right) + \log(e)}{hx+g}\,dx + \frac{A\log\left(hx+g\right)}{h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(h*x + g), x)
+ A*log(h*x + g)/h
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)}{g + h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(g + h*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(g + h*x), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.299 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2}\,dx$

Optimal. Leaf size=120

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{h(g+hx)}+\frac{Bn(bc-ad)\log(g+hx)}{(bg-ah)(dg-ch)}+\frac{bBn\log(a+bx)}{h(bg-ah)}-\frac{Bdn\log(c+dx)}{h(dg-ch)}$$

```
[Out] b*B*n*ln(b*x+a)/h/(-a*h+b*g)-B*d*n*ln(d*x+c)/h/(-c*h+d*g)+(-A-B*ln(e*(b*x+a
)^n/((d*x+c)^n)))/h/(h*x+g)+B*(-a*d+b*c)*n*ln(h*x+g)/(-a*h+b*g)/(-c*h+d*g)
```

Rubi [**A**] time = 0.12, antiderivative size = 132, normalized size of antiderivative = 1.10, number of steps used = 6, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {6742, 2490, 36, 31}

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)(bg-ah)}-\frac{Bn(bc-ad)\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{Bn(bc-ad)\log(g+hx)}{(bg-ah)(dg-ch)}-\frac{A}{h(g+hx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^2,x]
```

```
[Out] -(A/(h*(g + h*x))) - (B*(b*c - a*d)*n*Log[c + d*x])/((b*g - a*h)*(d*g - c*h
)) + (B*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a*h)*(g + h*x))
 + (B*(b*c - a*d)*n*Log[g + h*x])/((b*g - a*h)*(d*g - c*h))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\,dx &= \int \left(\frac{A}{(g+hx)^2}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\right)dx\\ &= -\frac{A}{h(g+hx)}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\,dx\\ &= -\frac{A}{h(g+hx)}+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}-\frac{(B(bc-ad)n)}{bg}\\ &= -\frac{A}{h(g+hx)}+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}-\frac{(Bd(bc-ad)n)}{(bg-ah)(d}\\ &= -\frac{A}{h(g+hx)}-\frac{B(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{B(a+bx)\log\left(e(a+bx)^n(c\right.}{(bg-ah)(g+hx)}\end{aligned}$$

Mathematica [**A**] time = 0.20, size = 117, normalized size = 0.98

$$\frac{-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}+\frac{Bn(b\log(a+bx)(dg-ch)+\log(c+dx)(adh-bdg)+h(bc-ad)\log(g+hx))}{(bg-ah)(dg-ch)}-\frac{A}{g+hx}}{h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^2,x]
```

```
[Out] (-(A/(g + h*x)) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x) + (B*n*(b*
(d*g - c*h)*Log[a + b*x] + (-(b*d*g) + a*d*h)*Log[c + d*x] + (b*c - a*d)*h*
Log[g + h*x]))/((b*g - a*h)*(d*g - c*h)))/h
```

fricas [**B**] time = 11.67, size = 250, normalized size = 2.08

$$-\frac{Abdg^2+Aach^2-(Abc+Aad)gh-\left(\left(Bbdgh-Bbch^2\right)nx+\left(Badgh-Bach^2\right)n\right)\log(bx+a)+\left(\left(Bbdgh-Ba\right.\right.}{bdg^3h+acgh^3-(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x, algorithm="fricas
")
```

```
[Out] -(A*b*d*g^2 + A*a*c*h^2 - (A*b*c + A*a*d)*g*h - ((B*b*d*g*h - B*b*c*h^2)*n*
x + (B*a*d*g*h - B*a*c*h^2)*n)*log(b*x + a) + ((B*b*d*g*h - B*a*d*h^2)*n*x
+ (B*b*c*g*h - B*a*c*h^2)*n)*log(d*x + c) - ((B*b*c - B*a*d)*h^2*n*x + (B*b
*c - B*a*d)*g*h*n)*log(h*x + g) + (B*b*d*g^2 + B*a*c*h^2 - (B*b*c + B*a*d)*
g*h)*log(e))/(b*d*g^3*h + a*c*g*h^3 - (b*c + a*d)*g^2*h^2 + (b*d*g^2*h^2 +
a*c*h^4 - (b*c + a*d)*g*h^3)*x)
```

giac [**A**] time = 0.38, size = 166, normalized size = 1.38

$$\frac{Bb^2n\log(|-bx-a|)}{b^2gh-abh^2}-\frac{Bd^2n\log(|dx+c|)}{d^2gh-cdh^2}-\frac{Bn\log(bx+a)}{h^2x+gh}+\frac{Bn\log(dx+c)}{h^2x+gh}+\frac{(Bbcn-Badn)\log\left(hx+g\right)}{bdg^2-bcgh-adgh+ach^2}-\frac{A}{h^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] B*b^2*n*log(abs(-b*x - a))/(b^2*g*h - a*b*h^2) - B*d^2*n*log(abs(d*x + c))/
(d^2*g*h - c*d*h^2) - B*n*log(b*x + a)/(h^2*x + g*h) + B*n*log(d*x + c)/(h^
2*x + g*h) + (B*b*c*n - B*a*d*n)*log(h*x + g)/(b*d*g^2 - b*c*g*h - a*d*g*h
+ a*c*h^2) - (A + B)/(h^2*x + g*h)
```

maple [C] time = 0.53, size = 1796, normalized size = 14.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x)
```

```
[Out] B/h/(h*x+g)*ln((d*x+c)^n)-1/2*(2*A*a*c*h^2+2*A*b*d*g^2-I*B*Pi*b*c*h*csgn(I/
((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g-I*B*Pi*b*c*h*csgn(I*(b*x+a)^
n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*g-I*B*Pi*a*d*h*csgn(I/((d*
x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g-I*B*Pi*b*d*g^2*csgn(I*(b*x+a)^n)
*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*B*Pi*a*d*h*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*g-I*B*Pi*a*c*h^2*csgn(
I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*Pi*b
*d*g^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)+I*B*Pi*a*d*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d
*x+c)^n))*g+I*B*Pi*b*c*h*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)*g-I*B*Pi*a*d*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^2*g-I*B*Pi*a*d*h*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g+I*
B*Pi*a*c*h^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a*c*h
^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a*c*h^2*csgn(
I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*a*d*h*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3*g-2*A*a*d*h*g-2*A*b*c*h*g+2*B*ln(h*x+g)*a*d*h^
2*n*x-2*B*ln(h*x+g)*b*c*h^2*n*x-2*B*ln(-d*x-c)*a*d*h^2*n*x+2*B*ln(-b*x-a)*b
*c*h^2*n*x+2*B*ln(h*x+g)*a*d*g*h*n-2*B*ln(h*x+g)*b*c*g*h*n-2*B*ln(-d*x-c)*a
*d*g*h*n+2*B*ln(-b*x-a)*b*c*g*h*n+2*B*a*c*h^2*ln((b*x+a)^n)+2*B*b*d*g^2*ln(
(b*x+a)^n)+I*B*Pi*b*d*g^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n
)*(b*x+a)^n)^2+I*B*Pi*a*c*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I
*B*Pi*b*c*h*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g-I*B*Pi*a*c*
h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*B
*Pi*b*c*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*g+2*B*ln(-d*x-c)*b*d*
g^2*n-2*B*ln(-b*x-a)*b*d*g^2*n+I*B*Pi*b*c*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+
c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*g+I*B*Pi*a*d*h*csgn(I*e)*csgn(I*(b*x+a
)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)*g-I*B*Pi*b*d*g^2*csgn(I*(b
*x+a)^n/((d*x+c)^n))^3-I*B*Pi*b*d*g^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*B
*Pi*b*d*g^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b*d*g^
2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b*c*h*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^3*g+I*B*Pi*b*d*g^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2-2*B*a*d*g*h*ln((b*x+a)^n)-2*B*b*c*g*h*ln((b*x+a)^n)+2*B*ln(e)*a
*c*h^2+2*B*ln(e)*b*d*g^2-I*B*Pi*a*c*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B
*Pi*a*c*h^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*B*Pi*a*d*h*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^3*g+I*B*Pi*b*c*h*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*g+2*B*ln(-
d*x-c)*b*d*g*h*n*x-2*B*ln(-b*x-a)*b*d*g*h*n*x-2*B*ln(e)*b*c*h*g-2*B*ln(e)*a
*d*h*g)/(h*x+g)/(a*c*h^2-a*d*g*h-b*c*g*h+b*d*g^2)/h
```

maxima [A] time = 0.76, size = 151, normalized size = 1.26

$$\frac{\left(\frac{ben\log(bx+a)}{bgh-ah^2} - \frac{den\log(dx+c)}{dgh-ch^2} - \frac{(bcen-aden)\log\left(hx+g\right)}{\left(dgh-ch^2\right)a-\left(dg^2-cgh\right)b}\right)B}{e} - \frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}{h^2x+gh} - \frac{A}{h^2x+gh}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x, algorithm="maxima
")
```

```
[Out] (b*e*n*log(b*x + a)/(b*g*h - a*h^2) - d*e*n*log(d*x + c)/(d*g*h - c*h^2) -
(b*c*e*n - a*d*e*n)*log(h*x + g)/((d*g*h - c*h^2)*a - (d*g^2 - c*g*h)*b))*B
/e - B*log((b*x + a)^n*e/(d*x + c)^n)/(h^2*x + g*h) - A/(h^2*x + g*h)
```

mupad [**B**] time = 4.72, size = 141, normalized size = 1.18

$$\frac{B\,d\,n\,\ln\left(c+d\,x\right)}{c\,h^2-d\,g\,h}-\frac{\ln\left(g+h\,x\right)\,\left(B\,a\,d\,n-B\,b\,c\,n\right)}{a\,c\,h^2+b\,d\,g^2-a\,d\,g\,h-b\,c\,g\,h}-\frac{B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)}{h\,\left(g+h\,x\right)}-\frac{B\,b\,n\,\ln\left(a+b\,x\right)}{a\,h^2-b\,g\,h}-\frac{A}{x\,h^2+g\,h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(g + h*x)^2,x)
```

```
[Out] (B*d*n*log(c + d*x))/(c*h^2 - d*g*h) - (log(g + h*x)*(B*a*d*n - B*b*c*n))/(
a*c*h^2 + b*d*g^2 - a*d*g*h - b*c*g*h) - (B*log((e*(a + b*x)^n)/(c + d*x)^n
))/(h*(g + h*x)) - (B*b*n*log(a + b*x))/(a*h^2 - b*g*h) - A/(g*h + h^2*x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**2,x)
```

```
[Out] Timed out
```

3.300 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^3}\,dx$

Optimal. Leaf size=191

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{2h(g+hx)^2}+\frac{b^2Bn\log(a+bx)}{2h(bg-ah)^2}-\frac{Bn(bc-ad)}{2(g+hx)(bg-ah)(dg-ch)}+\frac{Bn(bc-ad)\log(g+hx)(-a}{2(bg-ah)^2(dg-}$$

```
[Out] -1/2*B*(-a*d+b*c)*n/(-a*h+b*g)/(-c*h+d*g)/(h*x+g)+1/2*b^2*B*n*ln(b*x+a)/h/(
-a*h+b*g)^2-1/2*B*d^2*n*ln(d*x+c)/h/(-c*h+d*g)^2+1/2*(-A-B*ln(e*(b*x+a)^n/(
(d*x+c)^n)))/h/(h*x+g)^2+1/2*B*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)*n*ln(h*x+g
)/(-a*h+b*g)^2/(-c*h+d*g)^2
```

Rubi [A] time = 0.30, antiderivative size = 203, normalized size of antiderivative = 1.06, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$\frac{b^2Bn\log(a+bx)}{2h(bg-ah)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2}-\frac{Bn(bc-ad)}{2(g+hx)(bg-ah)(dg-ch)}+\frac{Bn(bc-ad)\log(g+hx)(-adh-b}{2(bg-ah)^2(dg-ch)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^3,x]
```

```
[Out] -A/(2*h*(g + h*x)^2) - (B*(b*c - a*d)*n)/(2*(b*g - a*h)*(d*g - c*h)*(g + h*
x)) + (b^2*B*n*Log[a + b*x])/(2*h*(b*g - a*h)^2) - (B*d^2*n*Log[c + d*x])/(
2*h*(d*g - c*h)^2) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h*(g + h*x)^2)
 + (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[g + h*x])/(2*(b*g - a*h)^
2*(d*g - c*h)^2)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\,dx &= \int \left(\frac{A}{(g+hx)^3}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\right)dx\\
&= -\frac{A}{2h(g+hx)^2}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\,dx\\
&= -\frac{A}{2h(g+hx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2}+\frac{(B(bc-ad)n)\int \frac{}{(a+bx}}{2h}\\
&= -\frac{A}{2h(g+hx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2}+\frac{(B(bc-ad)n)\int \Big(\frac{}{(bc-}}{}\\
&= -\frac{A}{2h(g+hx)^2}-\frac{B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)}+\frac{b^2Bn\log(a+bx)}{2h(bg-ah)^2}-
\end{aligned}
$$

Mathematica [A] time = 0.62, size = 178, normalized size = 0.93

$$
-\frac{Bn(bc-ad)\left(\frac{\frac{d^2\log(c+dx)}{bc-ad}+\frac{h\left(\frac{(bg-ah)(dg-ch)}{g+hx}+\log(g+hx)(adh+bch-2bdg)\right)}{(bg-ah)^2}}{(dg-ch)^2}-\frac{b^2\log(a+bx)}{(bc-ad)(bg-ah)^2}\right)+\frac{B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2}+\frac{A}{(g+hx)^2}}{2h}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^3,x]
```

```
[Out] -1/2*(A/(g + h*x)^2 + (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^2 + B*
(b*c - a*d)*n*(-((b^2*Log[a + b*x])/((b*c - a*d)*(b*g - a*h)^2)) + ((d^2*Lo
g[c + d*x])/(b*c - a*d) + (h*(((b*g - a*h)*(d*g - c*h))/(g + h*x) + (-2*b*d
*g + b*c*h + a*d*h)*Log[g + h*x]))/(b*g - a*h)^2)/(d*g - c*h)^2))/h
```

fricas [B] time = 149.49, size = 1127, normalized size = 5.90

$$
-\frac{Ab^2d^2g^4+Aa^2c^2h^4-2\left(Ab^2cd+Aabd^2\right)g^3h+\left(Ab^2c^2+4\,Aabcd+Aa^2d^2\right)g^2h^2-2\left(Aabc^2+Aa^2cd\right)gh^3+}{}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x, algorithm="fricas
")
```

```
[Out] -1/2*(A*b^2*d^2*g^4 + A*a^2*c^2*h^4 - 2*(A*b^2*c*d + A*a*b*d^2)*g^3*h + (A*
b^2*c^2 + 4*A*a*b*c*d + A*a^2*d^2)*g^2*h^2 - 2*(A*a*b*c^2 + A*a^2*c*d)*g*h^
3 + ((B*b^2*c*d - B*a*b*d^2)*g^2*h^2 - (B*b^2*c^2 - B*a^2*d^2)*g*h^3 + (B*a
*b*c^2 - B*a^2*c*d)*h^4)*n*x + ((B*b^2*c*d - B*a*b*d^2)*g^3*h - (B*b^2*c^2
- B*a^2*d^2)*g^2*h^2 + (B*a*b*c^2 - B*a^2*c*d)*g*h^3)*n - ((B*b^2*d^2*g^2*h
^2 - 2*B*b^2*c*d*g*h^3 + B*b^2*c^2*h^4)*n*x^2 + 2*(B*b^2*d^2*g^3*h - 2*B*b^
2*c*d*g^2*h^2 + B*b^2*c^2*g*h^3)*n*x + (2*B*a*b*d^2*g^3*h - B*a^2*c^2*h^4 -
 (4*B*a*b*c*d + B*a^2*d^2)*g^2*h^2 + 2*(B*a*b*c^2 + B*a^2*c*d)*g*h^3)*n)*lo
g(b*x + a) + ((B*b^2*d^2*g^2*h^2 - 2*B*a*b*d^2*g*h^3 + B*a^2*d^2*h^4)*n*x^2
 + 2*(B*b^2*d^2*g^3*h - 2*B*a*b*d^2*g^2*h^2 + B*a^2*d^2*g*h^3)*n*x + (2*B*b
^2*c*d*g^3*h - B*a^2*c^2*h^4 - (B*b^2*c^2 + 4*B*a*b*c*d)*g^2*h^2 + 2*(B*a*b
*c^2 + B*a^2*c*d)*g*h^3)*n)*log(d*x + c) - ((2*(B*b^2*c*d - B*a*b*d^2)*g*h^
3 - (B*b^2*c^2 - B*a^2*d^2)*h^4)*n*x^2 + 2*(2*(B*b^2*c*d - B*a*b*d^2)*g^2*h
^2 - (B*b^2*c^2 - B*a^2*d^2)*g*h^3)*n*x + (2*(B*b^2*c*d - B*a*b*d^2)*g^3*h
- (B*b^2*c^2 - B*a^2*d^2)*g^2*h^2)*n)*log(h*x + g) + (B*b^2*d^2*g^4 + B*a^2
*c^2*h^4 - 2*(B*b^2*c*d + B*a*b*d^2)*g^3*h + (B*b^2*c^2 + 4*B*a*b*c*d + B*a
```

```
^2*d^2)*g^2*h^2 - 2*(B*a*b*c^2 + B*a^2*c*d)*g*h^3)*log(e))/(b^2*d^2*g^6*h +
 a^2*c^2*g^2*h^5 - 2*(b^2*c*d + a*b*d^2)*g^5*h^2 + (b^2*c^2 + 4*a*b*c*d + a
^2*d^2)*g^4*h^3 - 2*(a*b*c^2 + a^2*c*d)*g^3*h^4 + (b^2*d^2*g^4*h^3 + a^2*c^
2*h^7 - 2*(b^2*c*d + a*b*d^2)*g^3*h^4 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*g^2
*h^5 - 2*(a*b*c^2 + a^2*c*d)*g*h^6)*x^2 + 2*(b^2*d^2*g^5*h^2 + a^2*c^2*g*h^
6 - 2*(b^2*c*d + a*b*d^2)*g^4*h^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*g^3*h^4
 - 2*(a*b*c^2 + a^2*c*d)*g^2*h^5)*x)
```

giac [**B**] time = 0.80, size = 523, normalized size = 2.74

$$\frac{Bb^3n\log\left(|bx+a|\right)}{2\left(b^3g^2h-2\,ab^2gh^2+a^2bh^3\right)}-\frac{Bd^3n\log\left(|dx+c|\right)}{2\left(d^3g^2h-2\,cd^2gh^2+c^2dh^3\right)}-\frac{Bn\log\left(bx+a\right)}{2\left(h^3x^2+2\,gh^2x+g^2h\right)}+\frac{Bn\log\left(dx+c\right)}{2\left(h^3x^2+2\,gh^2x+g^2h\right)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] 1/2*B*b^3*n*log(abs(b*x + a))/(b^3*g^2*h - 2*a*b^2*g*h^2 + a^2*b*h^3) - 1/2
*B*d^3*n*log(abs(d*x + c))/(d^3*g^2*h - 2*c*d^2*g*h^2 + c^2*d*h^3) - 1/2*B*
n*log(b*x + a)/(h^3*x^2 + 2*g*h^2*x + g^2*h) + 1/2*B*n*log(d*x + c)/(h^3*x^
2 + 2*g*h^2*x + g^2*h) + 1/2*(2*B*b^2*c*d*g*n - 2*B*a*b*d^2*g*n - B*b^2*c^2
*h*n + B*a^2*d^2*h*n)*log(h*x + g)/(b^2*d^2*g^4 - 2*b^2*c*d*g^3*h - 2*a*b*d
^2*g^3*h + b^2*c^2*g^2*h^2 + 4*a*b*c*d*g^2*h^2 + a^2*d^2*g^2*h^2 - 2*a*b*c^
2*g*h^3 - 2*a^2*c*d*g*h^3 + a^2*c^2*h^4) - 1/2*(B*b*c*h^2*n*x - B*a*d*h^2*n
*x + B*b*c*g*h*n - B*a*d*g*h*n + A*b*d*g^2 + B*b*d*g^2 - A*b*c*g*h - B*b*c*
g*h - A*a*d*g*h - B*a*d*g*h + A*a*c*h^2 + B*a*c*h^2)/(b*d*g^2*h^3*x^2 - b*c
*g*h^4*x^2 - a*d*g*h^4*x^2 + a*c*h^5*x^2 + 2*b*d*g^3*h^2*x - 2*b*c*g^2*h^3*
x - 2*a*d*g^2*h^3*x + 2*a*c*g*h^4*x + b*d*g^4*h - b*c*g^3*h^2 - a*d*g^3*h^2
 + a*c*g^2*h^3)
```

maple [**C**] time = 0.84, size = 4925, normalized size = 25.79

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x)
```

```
[Out] 1/2*B/h/(h*x+g)^2*ln((d*x+c)^n)-1/4*(-2*I*B*Pi*b^2*c*d*g^3*h*csgn(I/((d*x+c
)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*I*B*Pi*a*b*c^2*g*h^3*csgn(I*e)*csgn
(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*I*B*Pi*b^2*c*d*
g^3*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-2
*B*a^2*c*d*h^4*n*x+2*B*a^2*d^2*g*h^3*n*x+2*B*a*b*c^2*h^4*n*x-2*B*b^2*c^2*g*
h^3*n*x+2*A*a^2*c^2*h^4+2*A*b^2*d^2*g^4+2*B*a^2*d^2*g^2*h^2*n-2*B*b^2*c^2*g
^2*h^2*n+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B*Pi*a^2*
c^2*h^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*A*b^2*c^2*g
^2*h^2-2*B*ln(-h*x-g)*a^2*d^2*h^4*n*x^2+2*B*ln(-h*x-g)*b^2*c^2*h^4*n*x^2+2*
B*ln(-d*x-c)*a^2*d^2*h^4*n*x^2-2*B*ln(b*x+a)*b^2*c^2*h^4*n*x^2-2*B*ln(-h*x-
g)*a^2*d^2*g^2*h^2*n+2*B*ln(-h*x-g)*b^2*c^2*g^2*h^2*n+2*B*ln(-d*x-c)*a^2*d^
2*g^2*h^2*n-2*B*ln(b*x+a)*b^2*c^2*g^2*h^2*n+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*(
b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I/((d
*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*b^2*d^2*g^4*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^3-4*B*ln(-h*x-g)*a^2*d^2*g*h^3*n*x+4*B*ln(-h*x-g)*b^2*c^2
*g*h^3*n*x+4*B*ln(-d*x-c)*a^2*d^2*g*h^3*n*x+4*B*ln(-d*x-c)*b^2*d^2*g^3*h*n*
x-4*B*ln(b*x+a)*b^2*c^2*g*h^3*n*x-4*B*ln(b*x+a)*b^2*d^2*g^3*h*n*x+4*B*ln(-h
*x-g)*a*b*d^2*g^3*h*n-4*B*ln(-h*x-g)*b^2*c*d*g^3*h*n-4*B*ln(-d*x-c)*a*b*d^2
*g^3*h*n+4*B*ln(b*x+a)*b^2*c*d*g^3*h*n+2*B*ln(-d*x-c)*b^2*d^2*g^2*h^2*n*x^2
-2*B*ln(b*x+a)*b^2*d^2*g^2*h^2*n*x^2-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^
n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+2*A*a^2*d^2*g^2*h^2-2*I*B*
Pi*a^2*c*d*g*h^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi
```

```
*a^2*c*d*g*h^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi
*a^2*c*d*g*h^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^2+8*A*a*b*c*d*g^2*h^2-I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d
*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*(b*
x+a)^n/((d*x+c)^n))^3-4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^3-I*B*Pi*a^2*c^2*h^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2-I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*a
^2*c^2*h^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+
I*B*Pi*b^2*d^2*g^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*b^2*d
^2*g^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2*d^2*g^4
*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+8*B*ln(e)*a*b*c*d*g^2*
h^2+2*I*B*Pi*a*b*c^2*g*h^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+2*I*B*Pi*a*b*c^2
*g*h^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*e)*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^n)*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*e)*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*B*ln(e)*a^2*d^2*g^2*h^
2+2*B*ln(e)*b^2*c^2*g^2*h^2+2*B*a^2*d^2*g^2*h^2*ln((b*x+a)^n)+2*I*B*Pi*b^2*
c*d*g^3*h*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+2*I*B*Pi*b^2*c*d*g^3*h*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^3-I*B*Pi*b^2*d^2*g^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x
+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*B*ln(e)*a^2*c^2*h^4+2*B*ln(e)*b^2
*d^2*g^4+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(
I*(b*x+a)^n/((d*x+c)^n))+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I*
(b*x+a)^n/((d*x+c)^n))^2+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I/((d*x+c)^n))*csgn(
I*(b*x+a)^n/((d*x+c)^n))^2+2*B*ln(-d*x-c)*b^2*d^2*g^4*n-2*B*ln(b*x+a)*b^2*d
^2*g^4*n+2*I*B*Pi*a*b*c^2*g*h^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(
I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*e)*csgn(I*(b*x+a)^n/
((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*
e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-2*I*B*Pi*b
^2*c*d*g^3*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*b^2*c*d*g
^3*h*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-4*B*a*b*d^2*g^3*h*ln
((b*x+a)^n)-4*B*b^2*c*d*g^3*h*ln((b*x+a)^n)-4*B*a^2*c*d*g*h^3*ln((b*x+a)^n)
-4*B*a*b*c^2*g*h^3*ln((b*x+a)^n)-I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*(b*x+a)^n/((
d*x+c)^n))^3-I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*B*P
i*a^2*d^2*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^2+I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I
*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B
*Pi*b^2*c^2*g^2*h^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B
*Pi*b^2*c^2*g^2*h^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)-I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n
))*csgn(I*(b*x+a)^n/((d*x+c)^n))-2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*e)*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^2+2*B*b^2*c^2*g^2*h^2*ln((b*x+a)^n)-I*B*Pi*b^2*d^2*g
^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*
Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+
a)^n)^2+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+
2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-4*B*ln(e)*a^2*c*d*g*
h^3-4*B*ln(e)*a*b*c^2*g*h^3-4*B*ln(e)*a*b*d^2*g^3*h-4*B*ln(e)*b^2*c*d*g^3*h
-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
-4*A*a^2*c*d*g*h^3-4*A*a*b*c^2*g*h^3-4*A*a*b*d^2*g^3*h+2*I*B*Pi*a^2*c*d*g*h
^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-4*A*b^2*c*d*g^3*h-2*I*B*Pi*b^2*c*d*g^3
*h*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi
*a*b*c^2*g*h^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+8*B*a*b*c*d*g^2*
h^2*ln((b*x+a)^n)-2*B*a*b*d^2*g^2*h^2*n*x+2*B*b^2*c*d*g^2*h^2*n*x-2*I*B*Pi*
a*b*c^2*g*h^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi*a*
b*c^2*g*h^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi*a*
b*c^2*g*h^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2
+I*B*Pi*b^2*d^2*g^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^2+I*B*Pi*a^2*c^2*h^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B
*Pi*a^2*c^2*h^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a^
```

```
2*c^2*h^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*b^2*c^
2*g^2*h^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*B*Pi*a^2*c^2*h^4*csgn(I*(b*x+
a)^n/((d*x+c)^n))^3-I*B*Pi*a^2*c^2*h^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*
B*Pi*b^2*d^2*g^4*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-4*B*ln(-d*x-c)*a*b*d^2*g*h
^3*n*x^2+4*B*ln(b*x+a)*b^2*c*d*g*h^3*n*x^2+8*B*ln(-h*x-g)*a*b*d^2*g^2*h^2*n
*x-8*B*ln(-h*x-g)*b^2*c*d*g^2*h^2*n*x-8*B*ln(-d*x-c)*a*b*d^2*g^2*h^2*n*x+8*
B*ln(b*x+a)*b^2*c*d*g^2*h^2*n*x+4*B*ln(-h*x-g)*a*b*d^2*g*h^3*n*x^2-4*B*ln(-
h*x-g)*b^2*c*d*g*h^3*n*x^2+2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*(b*x+a)^n)*csgn(I/
((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*b^2*c*d*g^3*h*csgn(I*e)
*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*B*a^2*c^2*
h^4*ln((b*x+a)^n)+2*B*b^2*d^2*g^4*ln((b*x+a)^n)-4*I*B*Pi*a*b*c*d*g^2*h^2*cs
gn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-4*I*B
*Pi*a*b*c*d*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/
((d*x+c)^n))+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^2-2*B*a^2*c*d*g*h^3*n+2*B*a*b*c^2*g*h^3*n-2*B*a*b*
d^2*g^3*h*n+2*B*b^2*c*d*g^3*h*n)/(h*x+g)^2/(a*c*h^2-a*d*g*h-b*c*g*h+b*d*g^2
)/(-c*h+d*g)/h/(-a*h+b*g)
```

maxima [**B**]   time = 0.91, size = 382, normalized size = 2.00

$$\frac{\Bigg(\frac{b^2en\log(bx+a)}{b^2g^2h-2\,abgh^2+a^2h^3}-\frac{d^2en\log(dx+c)}{d^2g^2h-2\,cdgh^2+c^2h^3}-\frac{\left(2\,abd^2egn-a^2d^2ehn-\left(2\,cdegn-c^2ehn\right)b^2\right)\log\left(hx+g\right)}{\left(d^2g^2h^2-2\,cdgh^3+c^2h^4\right)a^2-2\left(d^2g^3h-2\,cdg^2h^2+c^2gh^3\right)ab+\left(d^2g^4-2\,cdg^3h+c^2g^2h^2\right)b^2}+\frac{}{\left(dg^2h-cgh\right.}}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x, algorithm="maxima
")
```

```
[Out] 1/2*(b^2*e*n*log(b*x + a)/(b^2*g^2*h - 2*a*b*g*h^2 + a^2*h^3) - d^2*e*n*log
(d*x + c)/(d^2*g^2*h - 2*c*d*g*h^2 + c^2*h^3) - (2*a*b*d^2*e*g*n - a^2*d^2*
e*h*n - (2*c*d*e*g*n - c^2*e*h*n)*b^2)*log(h*x + g)/((d^2*g^2*h^2 - 2*c*d*g
*h^3 + c^2*h^4)*a^2 - 2*(d^2*g^3*h - 2*c*d*g^2*h^2 + c^2*g*h^3)*a*b + (d^2*
g^4 - 2*c*d*g^3*h + c^2*g^2*h^2)*b^2) + (b*c*e*n - a*d*e*n)/((d*g^2*h - c*g
*h^2)*a - (d*g^3 - c*g^2*h)*b + ((d*g*h^2 - c*h^3)*a - (d*g^2*h - c*g*h^2)*
b)*x))*B/e - 1/2*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^3*x^2 + 2*g*h^2*x + g^
2*h) - 1/2*A/(h^3*x^2 + 2*g*h^2*x + g^2*h)
```

mupad [**B**]   time = 6.35, size = 431, normalized size = 2.26

$$\frac{\ln\left(g+h\,x\right)\,\left(h\,\left(B\,a^2\,d^2\,n-B\,b^2\,c^2\,n\right)-2\,B\,a\,b\,d^2\,g\,n+2\,B\,b^2\,c\,d\,g\,n\right)}{2\,a^2\,c^2\,h^4-4\,a^2\,c\,d\,g\,h^3+2\,a^2\,d^2\,g^2\,h^2-4\,a\,b\,c^2\,g\,h^3+8\,a\,b\,c\,d\,g^2\,h^2-4\,a\,b\,d^2\,g^3\,h+2\,b^2\,c^2\,g^2\,h^2-4\,b^2\,c\,d\,g^3\,h+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(g + h*x)^3,x)
```

```
[Out] (log(g + h*x)*(h*(B*a^2*d^2*n - B*b^2*c^2*n) - 2*B*a*b*d^2*g*n + 2*B*b^2*c*
d*g*n))/(2*a^2*c^2*h^4 + 2*b^2*d^2*g^4 + 2*a^2*d^2*g^2*h^2 + 2*b^2*c^2*g^2*
h^2 - 4*a*b*c^2*g*h^3 - 4*a*b*d^2*g^3*h - 4*a^2*c*d*g*h^3 - 4*b^2*c*d*g^3*h
 + 8*a*b*c*d*g^2*h^2) - ((A*a*c*h^2 + A*b*d*g^2 - A*a*d*g*h - A*b*c*g*h - B
*a*d*g*h*n + B*b*c*g*h*n)/(a*c*h^2 + b*d*g^2 - a*d*g*h - b*c*g*h) - (x*(B*a
*d*h^2*n - B*b*c*h^2*n))/(a*c*h^2 + b*d*g^2 - a*d*g*h - b*c*g*h))/(2*g^2*h
+ 2*h^3*x^2 + 4*g*h^2*x) - (B*log((e*(a + b*x)^n)/(c + d*x)^n))/(2*h*(g^2 +
 h^2*x^2 + 2*g*h*x)) + (B*b^2*n*log(a + b*x))/(2*a^2*h^3 + 2*b^2*g^2*h - 4*
a*b*g*h^2) - (B*d^2*n*log(c + d*x))/(2*c^2*h^3 + 2*d^2*g^2*h - 4*c*d*g*h^2)
```

sympy [**F(-1)**]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**3,x)
```

```
[Out] Timed out
```

3.301 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^4}\,dx$

Optimal. Leaf size=284

$$\frac{Bn(bc-ad)\log(g+hx)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{3(bg-ah)^3(dg-ch)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+}{3h(g+hx)^3}$$

```
[Out] -1/6*B*(-a*d+b*c)*n/(-a*h+b*g)/(-c*h+d*g)/(h*x+g)^2-1/3*B*(-a*d+b*c)*(-a*d*
h-b*c*h+2*b*d*g)*n/(-a*h+b*g)^2/(-c*h+d*g)^2/(h*x+g)+1/3*b^3*B*n*ln(b*x+a)/
h/(-a*h+b*g)^3-1/3*B*d^3*n*ln(d*x+c)/h/(-c*h+d*g)^3+1/3*(-A-B*ln(e*(b*x+a)^
n/((d*x+c)^n)))/h/(h*x+g)^3+1/3*B*(-a*d+b*c)*(a^2*d^2*h^2-a*b*d*h*(-c*h+3*d
*g)+b^2*(c^2*h^2-3*c*d*g*h+3*d^2*g^2))*n*ln(h*x+g)/(-a*h+b*g)^3/(-c*h+d*g)^
3
```

Rubi [A] time = 0.54, antiderivative size = 296, normalized size of antiderivative = 1.04, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = {6742, 2492, 72}

$$\frac{Bn(bc-ad)\log(g+hx)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{3(bg-ah)^3(dg-ch)^3}+\frac{b^3Bn\log(a+bx)}{3h(bg-ah)^3}-\frac{B\log(e(a+}{3h(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^4,x]
```

```
[Out] -A/(3*h*(g + h*x)^3) - (B*(b*c - a*d)*n)/(6*(b*g - a*h)*(d*g - c*h)*(g + h*
x)^2) - (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n)/(3*(b*g - a*h)^2*(d*g -
 c*h)^2*(g + h*x)) + (b^3*B*n*Log[a + b*x])/(3*h*(b*g - a*h)^3) - (B*d^3*n*
Log[c + d*x])/(3*h*(d*g - c*h)^3) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3
*h*(g + h*x)^3) + (B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h) + b^2
*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n*Log[g + h*x])/(3*(b*g - a*h)^3*(d*g -
 c*h)^3)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^4}\,dx &= \int \left(\frac{A}{(g+hx)^4}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^4}\right)dx\\ &= -\frac{A}{3h(g+hx)^3}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^4}\,dx\\ &= -\frac{A}{3h(g+hx)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h(g+hx)^3}+\frac{(B(bc-ad)n)\int \frac{}{(a+bx}}{3h}\\ &= -\frac{A}{3h(g+hx)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h(g+hx)^3}+\frac{(B(bc-ad)n)\int \Bigg(\frac{}{(bc-}}{}\\ &= -\frac{A}{3h(g+hx)^3}-\frac{B(bc-ad)n}{6(bg-ah)(dg-ch)(g+hx)^2}-\frac{B(bc-ad)(2bdg-b}{3(bg-ah)^2(dg-ch}\end{aligned}$$

Mathematica [**A**] time = 1.14, size = 273, normalized size = 0.96

$$-\frac{Bn(bc-ad)\Bigg(-\frac{2h\log(g+hx)\left(a^2d^2h^2+abdh(ch-3dg)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{(bg-ah)^3(dg-ch)^3}-\frac{2b^3\log(a+bx)}{(bc-ad)(bg-ah)^3}+\frac{2d^3\log(c+dx)}{(bc-ad)(dg-ch)^3}-\frac{2h(adh+bch-}{(g+hx)(bg-ah)^2(}}{6h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^4,x]
```

```
[Out] -1/6*((2*A)/(g + h*x)^3 + (2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^
3 + B*(b*c - a*d)*n*(h/((b*g - a*h)*(d*g - c*h)*(g + h*x)^2) - (2*h*(-2*b*d
*g + b*c*h + a*d*h))/((b*g - a*h)^2*(d*g - c*h)^2*(g + h*x)) - (2*b^3*Log[a
 + b*x])/((b*c - a*d)*(b*g - a*h)^3) + (2*d^3*Log[c + d*x])/((b*c - a*d)*(d
*g - c*h)^3) - (2*h*(a^2*d^2*h^2 + a*b*d*h*(-3*d*g + c*h) + b^2*(3*d^2*g^2
- 3*c*d*g*h + c^2*h^2))*Log[g + h*x])/((b*g - a*h)^3*(d*g - c*h)^3)))/h
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x, algorithm="fricas
")
```

```
[Out] Timed out
```

giac [**B**] time = 3.18, size = 1512, normalized size = 5.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x, algorithm="giac")
```

```
[Out] 1/3*B*b^4*n*log(abs(b*x + a))/(b^4*g^3*h - 3*a*b^3*g^2*h^2 + 3*a^2*b^2*g*h^
3 - a^3*b*h^4) - 1/3*B*d^4*n*log(abs(d*x + c))/(d^4*g^3*h - 3*c*d^3*g^2*h^2
 + 3*c^2*d^2*g*h^3 - c^3*d*h^4) - 1/3*B*n*log(b*x + a)/(h^4*x^3 + 3*g*h^3*x
^2 + 3*g^2*h^2*x + g^3*h) + 1/3*B*n*log(d*x + c)/(h^4*x^3 + 3*g*h^3*x^2 + 3
*g^2*h^2*x + g^3*h) + 1/3*(3*B*b^3*c*d^2*g^2*n - 3*B*a*b^2*d^3*g^2*n - 3*B*
b^3*c^2*d*g*h*n + 3*B*a^2*b*d^3*g*h*n + B*b^3*c^3*h^2*n - B*a^3*d^3*h^2*n)*
log(h*x + g)/(b^3*d^3*g^6 - 3*b^3*c*d^2*g^5*h - 3*a*b^2*d^3*g^5*h + 3*b^3*c
^2*d*g^4*h^2 + 9*a*b^2*c*d^2*g^4*h^2 + 3*a^2*b*d^3*g^4*h^2 - b^3*c^3*g^3*h^
```

```
3 - 9*a*b^2*c^2*d*g^3*h^3 - 9*a^2*b*c*d^2*g^3*h^3 - a^3*d^3*g^3*h^3 + 3*a*b
^2*c^3*g^2*h^4 + 9*a^2*b*c^2*d*g^2*h^4 + 3*a^3*c*d^2*g^2*h^4 - 3*a^2*b*c^3*
g*h^5 - 3*a^3*c^2*d*g*h^5 + a^3*c^3*h^6) - 1/6*(4*B*b^2*c*d*g*h^3*n*x^2 - 4
*B*a*b*d^2*g*h^3*n*x^2 - 2*B*b^2*c^2*h^4*n*x^2 + 2*B*a^2*d^2*h^4*n*x^2 + 9*
B*b^2*c*d*g^2*h^2*n*x - 9*B*a*b*d^2*g^2*h^2*n*x - 5*B*b^2*c^2*g*h^3*n*x + 5
*B*a^2*d^2*g*h^3*n*x + B*a*b*c^2*h^4*n*x - B*a^2*c*d*h^4*n*x + 5*B*b^2*c*d*
g^3*h*n - 5*B*a*b*d^2*g^3*h*n - 3*B*b^2*c^2*g^2*h^2*n + 3*B*a^2*d^2*g^2*h^2
*n + B*a*b*c^2*g*h^3*n - B*a^2*c*d*g*h^3*n + 2*A*b^2*d^2*g^4 + 2*B*b^2*d^2*
g^4 - 4*A*b^2*c*d*g^3*h - 4*B*b^2*c*d*g^3*h - 4*A*a*b*d^2*g^3*h - 4*B*a*b*d
^2*g^3*h + 2*A*b^2*c^2*g^2*h^2 + 2*B*b^2*c^2*g^2*h^2 + 8*A*a*b*c*d*g^2*h^2
+ 8*B*a*b*c*d*g^2*h^2 + 2*A*a^2*d^2*g^2*h^2 + 2*B*a^2*d^2*g^2*h^2 - 4*A*a*b
*c^2*g*h^3 - 4*B*a*b*c^2*g*h^3 - 4*A*a^2*c*d*g*h^3 - 4*B*a^2*c*d*g*h^3 + 2*
A*a^2*c^2*h^4 + 2*B*a^2*c^2*h^4)/(b^2*d^2*g^4*h^4*x^3 - 2*b^2*c*d*g^3*h^5*x
^3 - 2*a*b*d^2*g^3*h^5*x^3 + b^2*c^2*g^2*h^6*x^3 + 4*a*b*c*d*g^2*h^6*x^3 +
a^2*d^2*g^2*h^6*x^3 - 2*a*b*c^2*g*h^7*x^3 - 2*a^2*c*d*g*h^7*x^3 + a^2*c^2*h
^8*x^3 + 3*b^2*d^2*g^5*h^3*x^2 - 6*b^2*c*d*g^4*h^4*x^2 - 6*a*b*d^2*g^4*h^4*
x^2 + 3*b^2*c^2*g^3*h^5*x^2 + 12*a*b*c*d*g^3*h^5*x^2 + 3*a^2*d^2*g^3*h^5*x^
2 - 6*a*b*c^2*g^2*h^6*x^2 - 6*a^2*c*d*g^2*h^6*x^2 + 3*a^2*c^2*g*h^7*x^2 + 3
*b^2*d^2*g^6*h^2*x - 6*b^2*c*d*g^5*h^3*x - 6*a*b*d^2*g^5*h^3*x + 3*b^2*c^2*
g^4*h^4*x + 12*a*b*c*d*g^4*h^4*x + 3*a^2*d^2*g^4*h^4*x - 6*a*b*c^2*g^3*h^5*
x - 6*a^2*c*d*g^3*h^5*x + 3*a^2*c^2*g^2*h^6*x + b^2*d^2*g^7*h - 2*b^2*c*d*g
^6*h^2 - 2*a*b*d^2*g^6*h^2 + b^2*c^2*g^5*h^3 + 4*a*b*c*d*g^5*h^3 + a^2*d^2*
g^5*h^3 - 2*a*b*c^2*g^4*h^4 - 2*a^2*c*d*g^4*h^4 + a^2*c^2*g^3*h^5)
```

maple [C]   time = 1.19, size = 9645, normalized size = 33.96

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x)
```

```
[Out] result too large to display
```

maxima [B]   time = 1.89, size = 920, normalized size = 3.24

$$\left(\frac{2\,b^3 e n \log(bx+a)}{b^3g^3h-3\,ab^2g^2h^2+3\,a^2bgh^3-a^3h^4} - \frac{2\,d^3 e n \log(dx+c)}{d^3g^3h-3\,cd^2g^2h^2+3\,c^2dgh^3-c^3h^4} + \frac{2\left(3\,ab^2d^3eg^2n-3\,a^2bd^3eghn+a^3d\right.}{\left(d^3g^3h^3-3\,cd^2g^2h^4+3\,c^2dgh^5-c^3h^6\right)a^3-3\left(d^3g^4h^2-3\,cd^2g^3h^3+3\,c^2dg^2h^4-c\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x, algorithm="maxima
")
```

```
[Out] 1/6*(2*b^3*e*n*log(b*x + a)/(b^3*g^3*h - 3*a*b^2*g^2*h^2 + 3*a^2*b*g*h^3 -
a^3*h^4) - 2*d^3*e*n*log(d*x + c)/(d^3*g^3*h - 3*c*d^2*g^2*h^2 + 3*c^2*d*g*
h^3 - c^3*h^4) + 2*(3*a*b^2*d^3*e*g^2*n - 3*a^2*b*d^3*e*g*h*n + a^3*d^3*e*h
^2*n - (3*c*d^2*e*g^2*n - 3*c^2*d*e*g*h*n + c^3*e*h^2*n)*b^3)*log(h*x + g)/
((d^3*g^3*h^3 - 3*c*d^2*g^2*h^4 + 3*c^2*d*g*h^5 - c^3*h^6)*a^3 - 3*(d^3*g^4
*h^2 - 3*c*d^2*g^3*h^3 + 3*c^2*d*g^2*h^4 - c^3*g*h^5)*a^2*b + 3*(d^3*g^5*h
- 3*c*d^2*g^4*h^2 + 3*c^2*d*g^3*h^3 - c^3*g^2*h^4)*a*b^2 - (d^3*g^6 - 3*c*d
^2*g^5*h + 3*c^2*d*g^4*h^2 - c^3*g^3*h^3)*b^3) - ((3*d^2*e*g*h*n - c*d*e*h^
2*n)*a^2 - (5*d^2*e*g^2*n - c^2*e*h^2*n)*a*b + (5*c*d*e*g^2*n - 3*c^2*e*g*h
*n)*b^2 - 2*(2*a*b*d^2*e*g*h*n - a^2*d^2*e*h^2*n - (2*c*d*e*g*h*n - c^2*e*h
^2*n)*b^2)*x)/((d^2*g^4*h^2 - 2*c*d*g^3*h^3 + c^2*g^2*h^4)*a^2 - 2*(d^2*g^5
*h - 2*c*d*g^4*h^2 + c^2*g^3*h^3)*a*b + (d^2*g^6 - 2*c*d*g^5*h + c^2*g^4*h^
2)*b^2 + ((d^2*g^2*h^4 - 2*c*d*g*h^5 + c^2*h^6)*a^2 - 2*(d^2*g^3*h^3 - 2*c*
d*g^2*h^4 + c^2*g*h^5)*a*b + (d^2*g^4*h^2 - 2*c*d*g^3*h^3 + c^2*g^2*h^4)*b^
2)*x^2 + 2*((d^2*g^3*h^3 - 2*c*d*g^2*h^4 + c^2*g*h^5)*a^2 - 2*(d^2*g^4*h^2
- 2*c*d*g^3*h^3 + c^2*g^2*h^4)*a*b + (d^2*g^5*h - 2*c*d*g^4*h^2 + c^2*g^3*h
```

```
^3)*b^2)*x))*B/e - 1/3*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^4*x^3 + 3*g*h^3*
x^2 + 3*g^2*h^2*x + g^3*h) - 1/3*A/(h^4*x^3 + 3*g*h^3*x^2 + 3*g^2*h^2*x + g
^3*h)
```

mupad [B] time = 9.26, size = 1183, normalized size = 4.17

$$\frac{B\,d^3\,n\,\ln\left(c+d\,x\right)}{3\,c^3\,h^4-9\,c^2\,d\,g\,h^3+9\,c\,d^2\,g^2\,h^2-3\,d^3\,g^3\,h}-\frac{}{3\,a^3\,c^3\,h^6-9\,a^3\,c^2\,d\,g\,h^5+9\,a^3\,c\,d^2\,g^2\,h^4-3\,a^3\,d^3\,g^3\,h^3-9\,a^2\,b\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(g + h*x)^4,x)
```

```
[Out] (B*d^3*n*log(c + d*x))/(3*c^3*h^4 - 3*d^3*g^3*h + 9*c*d^2*g^2*h^2 - 9*c^2*d
*g*h^3) - (log(g + h*x)*(h^2*(B*a^3*d^3*n - B*b^3*c^3*n) - h*(3*B*a^2*b*d^3
*g*n - 3*B*b^3*c^2*d*g*n) + 3*B*a*b^2*d^3*g^2*n - 3*B*b^3*c*d^2*g^2*n))/(3*
a^3*c^3*h^6 + 3*b^3*d^3*g^6 - 3*a^3*d^3*g^3*h^3 - 3*b^3*c^3*g^3*h^3 - 9*a^2
*b*c^3*g*h^5 - 9*a*b^2*d^3*g^5*h - 9*a^3*c^2*d*g*h^5 - 9*b^3*c*d^2*g^5*h +
9*a*b^2*c^3*g^2*h^4 + 9*a^2*b*d^3*g^4*h^2 + 9*a^3*c*d^2*g^2*h^4 + 9*b^3*c^2
*d*g^4*h^2 + 27*a*b^2*c*d^2*g^4*h^2 - 27*a*b^2*c^2*d*g^3*h^3 - 27*a^2*b*c*d
^2*g^3*h^3 + 27*a^2*b*c^2*d*g^2*h^4) - (B*log((e*(a + b*x)^n)/(c + d*x)^n))
/(3*h*(g^3 + h^3*x^3 + 3*g^2*h*x + 3*g*h^2*x^2)) - (B*b^3*n*log(a + b*x))/(
3*a^3*h^4 - 3*b^3*g^3*h + 9*a*b^2*g^2*h^2 - 9*a^2*b*g*h^3) - ((2*A*a^2*c^2*
h^4 + 2*A*b^2*d^2*g^4 + 2*A*a^2*d^2*g^2*h^2 + 2*A*b^2*c^2*g^2*h^2 + 3*B*a^2
*d^2*g^2*h^2*n - 3*B*b^2*c^2*g^2*h^2*n - 4*A*a*b*c^2*g*h^3 - 4*A*a*b*d^2*g^
3*h - 4*A*a^2*c*d*g*h^3 - 4*A*b^2*c*d*g^3*h + 8*A*a*b*c*d*g^2*h^2 + B*a*b*c
^2*g*h^3*n - 5*B*a*b*d^2*g^3*h*n - B*a^2*c*d*g*h^3*n + 5*B*b^2*c*d*g^3*h*n)
/(2*(a^2*c^2*h^4 + b^2*d^2*g^4 + a^2*d^2*g^2*h^2 + b^2*c^2*g^2*h^2 - 2*a*b*
c^2*g*h^3 - 2*a*b*d^2*g^3*h - 2*a^2*c*d*g*h^3 - 2*b^2*c*d*g^3*h + 4*a*b*c*d
*g^2*h^2)) + (x*(B*a*b*c^2*h^4*n - B*a^2*c*d*h^4*n + 5*B*a^2*d^2*g*h^3*n -
5*B*b^2*c^2*g*h^3*n - 9*B*a*b*d^2*g^2*h^2*n + 9*B*b^2*c*d*g^2*h^2*n))/(2*(a
^2*c^2*h^4 + b^2*d^2*g^4 + a^2*d^2*g^2*h^2 + b^2*c^2*g^2*h^2 - 2*a*b*c^2*g*
h^3 - 2*a*b*d^2*g^3*h - 2*a^2*c*d*g*h^3 - 2*b^2*c*d*g^3*h + 4*a*b*c*d*g^2*h
^2)) + (x^2*(B*a^2*d^2*h^4*n - B*b^2*c^2*h^4*n - 2*B*a*b*d^2*g*h^3*n + 2*B*
b^2*c*d*g*h^3*n))/(a^2*c^2*h^4 + b^2*d^2*g^4 + a^2*d^2*g^2*h^2 + b^2*c^2*g^
2*h^2 - 2*a*b*c^2*g*h^3 - 2*a*b*d^2*g^3*h - 2*a^2*c*d*g*h^3 - 2*b^2*c*d*g^3
*h + 4*a*b*c*d*g^2*h^2))/(3*g^3*h + 3*h^4*x^3 + 9*g^2*h^2*x + 9*g*h^3*x^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**4,x)
```

```
[Out] Timed out
```

3.302 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^5}\,dx$

Optimal. Leaf size=389

$$-\frac{Bn(bc-ad)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{4(g+hx)(bg-ah)^3(dg-ch)^3}-\frac{Bn(bc-ad)\log(g+hx)(-adh-bch+2b}{4(bg}$$

```
[Out] -1/12*B*(-a*d+b*c)*n/(-a*h+b*g)/(-c*h+d*g)/(h*x+g)^3-1/8*B*(-a*d+b*c)*(-a*d
*h-b*c*h+2*b*d*g)*n/(-a*h+b*g)^2/(-c*h+d*g)^2/(h*x+g)^2-1/4*B*(-a*d+b*c)*(a
^2*d^2*h^2-a*b*d*h*(-c*h+3*d*g)+b^2*(c^2*h^2-3*c*d*g*h+3*d^2*g^2))*n/(-a*h+
b*g)^3/(-c*h+d*g)^3/(h*x+g)+1/4*b^4*B*n*ln(b*x+a)/h/(-a*h+b*g)^4-1/4*B*d^4*
n*ln(d*x+c)/h/(-c*h+d*g)^4+1/4*(-A-B*ln(e*(b*x+a)^n/((d*x+c)^n)))/h/(h*x+g)
^4-1/4*B*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)*(2*a*b*d^2*g*h-a^2*d^2*h^2-b^2*(
c^2*h^2-2*c*d*g*h+2*d^2*g^2))*n*ln(h*x+g)/(-a*h+b*g)^4/(-c*h+d*g)^4
```

Rubi [A] time = 0.82, antiderivative size = 401, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$, Rules used = $\{6742, 2492, 72\}$

$$-\frac{Bn(bc-ad)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{4(g+hx)(bg-ah)^3(dg-ch)^3}-\frac{Bn(bc-ad)\log(g+hx)(-adh-bch+2b}{4(b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^5,x]
```

```
[Out] -A/(4*h*(g + h*x)^4) - (B*(b*c - a*d)*n)/(12*(b*g - a*h)*(d*g - c*h)*(g + h
*x)^3) - (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n)/(8*(b*g - a*h)^2*(d*g
- c*h)^2*(g + h*x)^2) - (B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h)
 + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n)/(4*(b*g - a*h)^3*(d*g - c*h)^3
*(g + h*x)) + (b^4*B*n*Log[a + b*x])/(4*h*(b*g - a*h)^4) - (B*d^4*n*Log[c +
 d*x])/(4*h*(d*g - c*h)^4) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*h*(g +
 h*x)^4) - (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*(2*a*b*d^2*g*h - a^2*d^
2*h^2 - b^2*(2*d^2*g^2 - 2*c*d*g*h + c^2*h^2))*n*Log[g + h*x])/(4*(b*g - a*
h)^4*(d*g - c*h)^4)
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^5}\,dx &= \int \left(\frac{A}{(g+hx)^5}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^5}\right)dx\\ &= -\frac{A}{4h(g+hx)^4}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^5}\,dx\\ &= -\frac{A}{4h(g+hx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h(g+hx)^4}+\frac{(B(bc-ad)n)\int \frac{}{(a+bx}}{4h}\\ &= -\frac{A}{4h(g+hx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h(g+hx)^4}+\frac{(B(bc-ad)n)\int\Bigl(\frac{}{(bc-}}{}\\ &= -\frac{A}{4h(g+hx)^4}-\frac{B(bc-ad)n}{12(bg-ah)(dg-ch)(g+hx)^3}-\frac{B(bc-ad)(2bdg-}{8(bg-ah)^2(dg-c}\end{aligned}$$

Mathematica [**A**] time = 1.21, size = 366, normalized size = 0.94

$$-\frac{-Bn(bc-ad)\Bigl(-\frac{h\left(a^2d^2h^2+abdh(ch-3dg)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{(g+hx)(bg-ah)^3(dg-ch)^3}-\frac{h\log(g+hx)(adh+bch-2bdg)\left(a^2d^2h^2-2abd^2gh+b^2\left(c^2h^2-2cdgh+2d^2\right.\right.}{(bg-ah)^4(dg-ch)^4}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^5,x]
```

```
[Out] -1/4*(A/(g + h*x)^4 + (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^4 - B*
(b*c - a*d)*n*(-1/3*h/((b*g - a*h)*(d*g - c*h)*(g + h*x)^3) + (h*(-2*b*d*g
+ b*c*h + a*d*h))/(2*(b*g - a*h)^2*(d*g - c*h)^2*(g + h*x)^2) - (h*(a^2*d^2
*h^2 + a*b*d*h*(-3*d*g + c*h) + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2)))/((b
*g - a*h)^3*(d*g - c*h)^3*(g + h*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*g
 - a*h)^4) - (d^4*Log[c + d*x])/((b*c - a*d)*(d*g - c*h)^4) - (h*(-2*b*d*g
+ b*c*h + a*d*h)*(-2*a*b*d^2*g*h + a^2*d^2*h^2 + b^2*(2*d^2*g^2 - 2*c*d*g*h
 + c^2*h^2))*Log[g + h*x])/((b*g - a*h)^4*(d*g - c*h)^4)))/h
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x, algorithm="fricas
")
```

```
[Out] Timed out
```

giac [**B**] time = 15.66, size = 3293, normalized size = 8.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x, algorithm="giac")
```

```
[Out] 1/4*B*b^5*n*log(abs(b*x + a))/(b^5*g^4*h - 4*a*b^4*g^3*h^2 + 6*a^2*b^3*g^2*
h^3 - 4*a^3*b^2*g*h^4 + a^4*b*h^5) - 1/4*B*d^5*n*log(abs(d*x + c))/(d^5*g^4
*h - 4*c*d^4*g^3*h^2 + 6*c^2*d^3*g^2*h^3 - 4*c^3*d^2*g*h^4 + c^4*d*h^5) - 1
/4*B*n*log(b*x + a)/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x^2 + 4*g^3*h^2*x +
g^4*h) + 1/4*B*n*log(d*x + c)/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x^2 + 4*g^
3*h^2*x + g^4*h) + 1/4*(4*B*b^4*c*d^3*g^3*n - 4*B*a*b^3*d^4*g^3*n - 6*B*b^4
```

```
*c^2*d^2*g^2*h*n + 6*B*a^2*b^2*d^4*g^2*h*n + 4*B*b^4*c^3*d*g*h^2*n - 4*B*a^
3*b*d^4*g*h^2*n - B*b^4*c^4*h^3*n + B*a^4*d^4*h^3*n)*log(h*x + g)/(b^4*d^4*
g^8 - 4*b^4*c*d^3*g^7*h - 4*a*b^3*d^4*g^7*h + 6*b^4*c^2*d^2*g^6*h^2 + 16*a*
b^3*c*d^3*g^6*h^2 + 6*a^2*b^2*d^4*g^6*h^2 - 4*b^4*c^3*d*g^5*h^3 - 24*a*b^3*
c^2*d^2*g^5*h^3 - 24*a^2*b^2*c*d^3*g^5*h^3 - 4*a^3*b*d^4*g^5*h^3 + b^4*c^4*
g^4*h^4 + 16*a*b^3*c^3*d*g^4*h^4 + 36*a^2*b^2*c^2*d^2*g^4*h^4 + 16*a^3*b*c*
d^3*g^4*h^4 + a^4*d^4*g^4*h^4 - 4*a*b^3*c^4*g^3*h^5 - 24*a^2*b^2*c^3*d*g^3*
h^5 - 24*a^3*b*c^2*d^2*g^3*h^5 - 4*a^4*c*d^3*g^3*h^5 + 6*a^2*b^2*c^4*g^2*h^
6 + 16*a^3*b*c^3*d*g^2*h^6 + 6*a^4*c^2*d^2*g^2*h^6 - 4*a^3*b*c^4*g*h^7 - 4*
a^4*c^3*d*g*h^7 + a^4*c^4*h^8) - 1/24*(18*B*b^3*c*d^2*g^2*h^4*n*x^3 - 18*B*
a*b^2*d^3*g^2*h^4*n*x^3 - 18*B*b^3*c^2*d*g*h^5*n*x^3 + 18*B*a^2*b*d^3*g*h^5
*n*x^3 + 6*B*b^3*c^3*h^6*n*x^3 - 6*B*a^3*d^3*h^6*n*x^3 + 60*B*b^3*c*d^2*g^3
*h^3*n*x^2 - 60*B*a*b^2*d^3*g^3*h^3*n*x^2 - 63*B*b^3*c^2*d*g^2*h^4*n*x^2 +
63*B*a^2*b*d^3*g^2*h^4*n*x^2 + 21*B*b^3*c^3*g*h^5*n*x^2 + 9*B*a*b^2*c^2*d*g
*h^5*n*x^2 - 9*B*a^2*b*c*d^2*g*h^5*n*x^2 - 21*B*a^3*d^3*g*h^5*n*x^2 - 3*B*a
*b^2*c^3*h^6*n*x^2 + 3*B*a^3*c*d^2*h^6*n*x^2 + 68*B*b^3*c*d^2*g^4*h^2*n*x -
 68*B*a*b^2*d^3*g^4*h^2*n*x - 76*B*b^3*c^2*d*g^3*h^3*n*x + 76*B*a^2*b*d^3*g
^3*h^3*n*x + 26*B*b^3*c^3*g^2*h^4*n*x + 24*B*a*b^2*c^2*d*g^2*h^4*n*x - 24*B
*a^2*b*c*d^2*g^2*h^4*n*x - 26*B*a^3*d^3*g^2*h^4*n*x - 10*B*a*b^2*c^3*g*h^5*
n*x + 10*B*a^3*c*d^2*g*h^5*n*x + 2*B*a^2*b*c^3*h^6*n*x - 2*B*a^3*c^2*d*h^6*
n*x + 26*B*b^3*c*d^2*g^5*h*n - 26*B*a*b^2*d^3*g^5*h*n - 31*B*b^3*c^2*d*g^4*
h^2*n + 31*B*a^2*b*d^3*g^4*h^2*n + 11*B*b^3*c^3*g^3*h^3*n + 15*B*a*b^2*c^2*
d*g^3*h^3*n - 15*B*a^2*b*c*d^2*g^3*h^3*n - 11*B*a^3*d^3*g^3*h^3*n - 7*B*a*b
^2*c^3*g^2*h^4*n + 7*B*a^3*c*d^2*g^2*h^4*n + 2*B*a^2*b*c^3*g*h^5*n - 2*B*a^
3*c^2*d*g*h^5*n + 6*A*b^3*d^3*g^6 + 6*B*b^3*d^3*g^6 - 18*A*b^3*c*d^2*g^5*h
- 18*B*b^3*c*d^2*g^5*h - 18*A*a*b^2*d^3*g^5*h - 18*B*a*b^2*d^3*g^5*h + 18*A
*b^3*c^2*d*g^4*h^2 + 18*B*b^3*c^2*d*g^4*h^2 + 54*A*a*b^2*c*d^2*g^4*h^2 + 54
*B*a*b^2*c*d^2*g^4*h^2 + 18*A*a^2*b*d^3*g^4*h^2 + 18*B*a^2*b*d^3*g^4*h^2 -
6*A*b^3*c^3*g^3*h^3 - 6*B*b^3*c^3*g^3*h^3 - 54*A*a*b^2*c^2*d*g^3*h^3 - 54*B
*a*b^2*c^2*d*g^3*h^3 - 54*A*a^2*b*c*d^2*g^3*h^3 - 54*B*a^2*b*c*d^2*g^3*h^3
- 6*A*a^3*d^3*g^3*h^3 - 6*B*a^3*d^3*g^3*h^3 + 18*A*a*b^2*c^3*g^2*h^4 + 18*B
*a*b^2*c^3*g^2*h^4 + 54*A*a^2*b*c^2*d*g^2*h^4 + 54*B*a^2*b*c^2*d*g^2*h^4 +
18*A*a^3*c*d^2*g^2*h^4 + 18*B*a^3*c*d^2*g^2*h^4 - 18*A*a^2*b*c^3*g*h^5 - 18
*B*a^2*b*c^3*g*h^5 - 18*A*a^3*c^2*d*g*h^5 - 18*B*a^3*c^2*d*g*h^5 + 6*A*a^3*
c^3*h^6 + 6*B*a^3*c^3*h^6)/(b^3*d^3*g^6*h^5*x^4 - 3*b^3*c*d^2*g^5*h^6*x^4 -
 3*a*b^2*d^3*g^5*h^6*x^4 + 3*b^3*c^2*d*g^4*h^7*x^4 + 9*a*b^2*c*d^2*g^4*h^7*
x^4 + 3*a^2*b*d^3*g^4*h^7*x^4 - b^3*c^3*g^3*h^8*x^4 - 9*a*b^2*c^2*d*g^3*h^8
*x^4 - 9*a^2*b*c*d^2*g^3*h^8*x^4 - a^3*d^3*g^3*h^8*x^4 + 3*a*b^2*c^3*g^2*h^
9*x^4 + 9*a^2*b*c^2*d*g^2*h^9*x^4 + 3*a^3*c*d^2*g^2*h^9*x^4 - 3*a^2*b*c^3*g
*h^10*x^4 - 3*a^3*c^2*d*g*h^10*x^4 + a^3*c^3*h^11*x^4 + 4*b^3*d^3*g^7*h^4*x
^3 - 12*b^3*c*d^2*g^6*h^5*x^3 - 12*a*b^2*d^3*g^6*h^5*x^3 + 12*b^3*c^2*d*g^5
*h^6*x^3 + 36*a*b^2*c*d^2*g^5*h^6*x^3 + 12*a^2*b*d^3*g^5*h^6*x^3 - 4*b^3*c^
3*g^4*h^7*x^3 - 36*a*b^2*c^2*d*g^4*h^7*x^3 - 36*a^2*b*c*d^2*g^4*h^7*x^3 - 4
*a^3*d^3*g^4*h^7*x^3 + 12*a*b^2*c^3*g^3*h^8*x^3 + 36*a^2*b*c^2*d*g^3*h^8*x^
3 + 12*a^3*c*d^2*g^3*h^8*x^3 - 12*a^2*b*c^3*g^2*h^9*x^3 - 12*a^3*c^2*d*g^2*
h^9*x^3 + 4*a^3*c^3*g*h^10*x^3 + 6*b^3*d^3*g^8*h^3*x^2 - 18*b^3*c*d^2*g^7*h
^4*x^2 - 18*a*b^2*d^3*g^7*h^4*x^2 + 18*b^3*c^2*d*g^6*h^5*x^2 + 54*a*b^2*c*d
^2*g^6*h^5*x^2 + 18*a^2*b*d^3*g^6*h^5*x^2 - 6*b^3*c^3*g^5*h^6*x^2 - 54*a*b^
2*c^2*d*g^5*h^6*x^2 - 54*a^2*b*c*d^2*g^5*h^6*x^2 - 6*a^3*d^3*g^5*h^6*x^2 +
18*a*b^2*c^3*g^4*h^7*x^2 + 54*a^2*b*c^2*d*g^4*h^7*x^2 + 18*a^3*c*d^2*g^4*h^
7*x^2 - 18*a^2*b*c^3*g^3*h^8*x^2 - 18*a^3*c^2*d*g^3*h^8*x^2 + 6*a^3*c^3*g^2
*h^9*x^2 + 4*b^3*d^3*g^9*h^2*x - 12*b^3*c*d^2*g^8*h^3*x - 12*a*b^2*d^3*g^8*
h^3*x + 12*b^3*c^2*d*g^7*h^4*x + 36*a*b^2*c*d^2*g^7*h^4*x + 12*a^2*b*d^3*g^
7*h^4*x - 4*b^3*c^3*g^6*h^5*x - 36*a*b^2*c^2*d*g^6*h^5*x - 36*a^2*b*c*d^2*g
^6*h^5*x - 4*a^3*d^3*g^6*h^5*x + 12*a*b^2*c^3*g^5*h^6*x + 36*a^2*b*c^2*d*g^
5*h^6*x + 12*a^3*c*d^2*g^5*h^6*x - 12*a^2*b*c^3*g^4*h^7*x - 12*a^3*c^2*d*g^
4*h^7*x + 4*a^3*c^3*g^3*h^8*x + b^3*d^3*g^10*h - 3*b^3*c*d^2*g^9*h^2 - 3*a*
b^2*d^3*g^9*h^2 + 3*b^3*c^2*d*g^8*h^3 + 9*a*b^2*c*d^2*g^8*h^3 + 3*a^2*b*d^3
*g^8*h^3 - b^3*c^3*g^7*h^4 - 9*a*b^2*c^2*d*g^7*h^4 - 9*a^2*b*c*d^2*g^7*h^4
```

```
- a^3*d^3*g^7*h^4 + 3*a*b^2*c^3*g^6*h^5 + 9*a^2*b*c^2*d*g^6*h^5 + 3*a^3*c*d
^2*g^6*h^5 - 3*a^2*b*c^3*g^5*h^6 - 3*a^3*c^2*d*g^5*h^6 + a^3*c^3*g^4*h^7)
```

maple [**C**]   time = 1.73, size = 16077, normalized size = 41.33

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x)
```

```
[Out] result too large to display
```

maxima [**B**]   time = 2.97, size = 1912, normalized size = 4.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x, algorithm="maxima
")
```

```
[Out] 1/24*(6*b^4*e*n*log(b*x + a)/(b^4*g^4*h - 4*a*b^3*g^3*h^2 + 6*a^2*b^2*g^2*h
^3 - 4*a^3*b*g*h^4 + a^4*h^5) - 6*d^4*e*n*log(d*x + c)/(d^4*g^4*h - 4*c*d^3
*g^3*h^2 + 6*c^2*d^2*g^2*h^3 - 4*c^3*d*g*h^4 + c^4*h^5) - 6*(4*a*b^3*d^4*e*
g^3*n - 6*a^2*b^2*d^4*e*g^2*h*n + 4*a^3*b*d^4*e*g*h^2*n - a^4*d^4*e*h^3*n -
 (4*c*d^3*e*g^3*n - 6*c^2*d^2*e*g^2*h*n + 4*c^3*d*e*g*h^2*n - c^4*e*h^3*n)*
b^4)*log(h*x + g)/((d^4*g^4*h^4 - 4*c*d^3*g^3*h^5 + 6*c^2*d^2*g^2*h^6 - 4*c
^3*d*g*h^7 + c^4*h^8)*a^4 - 4*(d^4*g^5*h^3 - 4*c*d^3*g^4*h^4 + 6*c^2*d^2*g^
3*h^5 - 4*c^3*d*g^2*h^6 + c^4*g*h^7)*a^3*b + 6*(d^4*g^6*h^2 - 4*c*d^3*g^5*h
^3 + 6*c^2*d^2*g^4*h^4 - 4*c^3*d*g^3*h^5 + c^4*g^2*h^6)*a^2*b^2 - 4*(d^4*g^
7*h - 4*c*d^3*g^6*h^2 + 6*c^2*d^2*g^5*h^3 - 4*c^3*d*g^4*h^4 + c^4*g^3*h^5)*
a*b^3 + (d^4*g^8 - 4*c*d^3*g^7*h + 6*c^2*d^2*g^6*h^2 - 4*c^3*d*g^5*h^3 + c^
4*g^4*h^4)*b^4) - ((11*d^3*e*g^2*h^2*n - 7*c*d^2*e*g*h^3*n + 2*c^2*d*e*h^4*
n)*a^3 - (31*d^3*e*g^3*h*n - 15*c*d^2*e*g^2*h^2*n + 2*c^3*e*h^4*n)*a^2*b +
(26*d^3*e*g^4*n - 15*c^2*d*e*g^2*h^2*n + 7*c^3*e*g*h^3*n)*a*b^2 - (26*c*d^2
*e*g^4*n - 31*c^2*d*e*g^3*h*n + 11*c^3*e*g^2*h^2*n)*b^3 + 6*(3*a*b^2*d^3*e*
g^2*h^2*n - 3*a^2*b*d^3*e*g*h^3*n + a^3*d^3*e*h^4*n - (3*c*d^2*e*g^2*h^2*n
- 3*c^2*d*e*g*h^3*n + c^3*e*h^4*n)*b^3)*x^2 + 3*((5*d^3*e*g*h^3*n - c*d^2*e
*h^4*n)*a^3 - 3*(5*d^3*e*g^2*h^2*n - c*d^2*e*g*h^3*n)*a^2*b + (14*d^3*e*g^3
*h*n - 3*c^2*d*e*g*h^3*n + c^3*e*h^4*n)*a*b^2 - (14*c*d^2*e*g^3*h*n - 15*c^
2*d*e*g^2*h^2*n + 5*c^3*e*g*h^3*n)*b^3)*x)/((d^3*g^6*h^3 - 3*c*d^2*g^5*h^4
+ 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*a^3 - 3*(d^3*g^7*h^2 - 3*c*d^2*g^6*h^3 + 3
*c^2*d*g^5*h^4 - c^3*g^4*h^5)*a^2*b + 3*(d^3*g^8*h - 3*c*d^2*g^7*h^2 + 3*c^
2*d*g^6*h^3 - c^3*g^5*h^4)*a*b^2 - (d^3*g^9 - 3*c*d^2*g^8*h + 3*c^2*d*g^7*h
^2 - c^3*g^6*h^3)*b^3 + ((d^3*g^3*h^6 - 3*c*d^2*g^2*h^7 + 3*c^2*d*g*h^8 - c
^3*h^9)*a^3 - 3*(d^3*g^4*h^5 - 3*c*d^2*g^3*h^6 + 3*c^2*d*g^2*h^7 - c^3*g*h^
8)*a^2*b + 3*(d^3*g^5*h^4 - 3*c*d^2*g^4*h^5 + 3*c^2*d*g^3*h^6 - c^3*g^2*h^7
)*a*b^2 - (d^3*g^6*h^3 - 3*c*d^2*g^5*h^4 + 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*b
^3)*x^3 + 3*((d^3*g^4*h^5 - 3*c*d^2*g^3*h^6 + 3*c^2*d*g^2*h^7 - c^3*g*h^8)*
a^3 - 3*(d^3*g^5*h^4 - 3*c*d^2*g^4*h^5 + 3*c^2*d*g^3*h^6 - c^3*g^2*h^7)*a^2
*b + 3*(d^3*g^6*h^3 - 3*c*d^2*g^5*h^4 + 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*a*b^
2 - (d^3*g^7*h^2 - 3*c*d^2*g^6*h^3 + 3*c^2*d*g^5*h^4 - c^3*g^4*h^5)*b^3)*x^
2 + 3*((d^3*g^5*h^4 - 3*c*d^2*g^4*h^5 + 3*c^2*d*g^3*h^6 - c^3*g^2*h^7)*a^3
- 3*(d^3*g^6*h^3 - 3*c*d^2*g^5*h^4 + 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*a^2*b +
 3*(d^3*g^7*h^2 - 3*c*d^2*g^6*h^3 + 3*c^2*d*g^5*h^4 - c^3*g^4*h^5)*a*b^2 -
(d^3*g^8*h - 3*c*d^2*g^7*h^2 + 3*c^2*d*g^6*h^3 - c^3*g^5*h^4)*b^3)*x))*B/e
- 1/4*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x
^2 + 4*g^3*h^2*x + g^4*h) - 1/4*A/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x^2 +
4*g^3*h^2*x + g^4*h)
```

mupad [**B**]   time = 14.28, size = 2570, normalized size = 6.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))/(g + h*x)^5,x)
```

```
[Out] ((x*(13*B*a^3*d^3*g^2*h^4*n - 13*B*b^3*c^3*g^2*h^4*n - B*a^2*b*c^3*h^6*n +
B*a^3*c^2*d*h^6*n + 5*B*a*b^2*c^3*g*h^5*n - 5*B*a^3*c*d^2*g*h^5*n + 34*B*a*
b^2*d^3*g^4*h^2*n - 38*B*a^2*b*d^3*g^3*h^3*n - 34*B*b^3*c*d^2*g^4*h^2*n + 3
8*B*b^3*c^2*d*g^3*h^3*n - 12*B*a*b^2*c^2*d*g^2*h^4*n + 12*B*a^2*b*c*d^2*g^2
*h^4*n))/(3*(a^3*c^3*h^6 + b^3*d^3*g^6 - a^3*d^3*g^3*h^3 - b^3*c^3*g^3*h^3
- 3*a^2*b*c^3*g*h^5 - 3*a*b^2*d^3*g^5*h - 3*a^3*c^2*d*g*h^5 - 3*b^3*c*d^2*g
^5*h + 3*a*b^2*c^3*g^2*h^4 + 3*a^2*b*d^3*g^4*h^2 + 3*a^3*c*d^2*g^2*h^4 + 3*
b^3*c^2*d*g^4*h^2 + 9*a*b^2*c*d^2*g^4*h^2 - 9*a*b^2*c^2*d*g^3*h^3 - 9*a^2*b
*c*d^2*g^3*h^3 + 9*a^2*b*c^2*d*g^2*h^4)) - (6*A*a^3*c^3*h^6 + 6*A*b^3*d^3*g
^6 - 6*A*a^3*d^3*g^3*h^3 - 6*A*b^3*c^3*g^3*h^3 + 18*A*a*b^2*c^3*g^2*h^4 + 1
8*A*a^2*b*d^3*g^4*h^2 + 18*A*a^3*c*d^2*g^2*h^4 + 18*A*b^3*c^2*d*g^4*h^2 - 1
1*B*a^3*d^3*g^3*h^3*n + 11*B*b^3*c^3*g^3*h^3*n - 18*A*a^2*b*c^3*g*h^5 - 18*
A*a*b^2*d^3*g^5*h - 18*A*a^3*c^2*d*g*h^5 - 18*A*b^3*c*d^2*g^5*h + 2*B*a^2*b
*c^3*g*h^5*n - 26*B*a*b^2*d^3*g^5*h*n - 2*B*a^3*c^2*d*g*h^5*n + 26*B*b^3*c*
d^2*g^5*h*n + 54*A*a*b^2*c*d^2*g^4*h^2 - 54*A*a*b^2*c^2*d*g^3*h^3 - 54*A*a^
2*b*c*d^2*g^3*h^3 + 54*A*a^2*b*c^2*d*g^2*h^4 - 7*B*a*b^2*c^3*g^2*h^4*n + 31
*B*a^2*b*d^3*g^4*h^2*n + 7*B*a^3*c*d^2*g^2*h^4*n - 31*B*b^3*c^2*d*g^4*h^2*n
 + 15*B*a*b^2*c^2*d*g^3*h^3*n - 15*B*a^2*b*c*d^2*g^3*h^3*n)/(6*(a^3*c^3*h^6
 + b^3*d^3*g^6 - a^3*d^3*g^3*h^3 - b^3*c^3*g^3*h^3 - 3*a^2*b*c^3*g*h^5 - 3*
a*b^2*d^3*g^5*h - 3*a^3*c^2*d*g*h^5 - 3*b^3*c*d^2*g^5*h + 3*a*b^2*c^3*g^2*h
^4 + 3*a^2*b*d^3*g^4*h^2 + 3*a^3*c*d^2*g^2*h^4 + 3*b^3*c^2*d*g^4*h^2 + 9*a*
b^2*c*d^2*g^4*h^2 - 9*a*b^2*c^2*d*g^3*h^3 - 9*a^2*b*c*d^2*g^3*h^3 + 9*a^2*b
*c^2*d*g^2*h^4)) + (x^3*(B*a^3*d^3*h^6*n - B*b^3*c^3*h^6*n - 3*B*a^2*b*d^3*
g*h^5*n + 3*B*b^3*c^2*d*g*h^5*n + 3*B*a*b^2*d^3*g^2*h^4*n - 3*B*b^3*c*d^2*g
^2*h^4*n))/(a^3*c^3*h^6 + b^3*d^3*g^6 - a^3*d^3*g^3*h^3 - b^3*c^3*g^3*h^3 -
 3*a^2*b*c^3*g*h^5 - 3*a*b^2*d^3*g^5*h - 3*a^3*c^2*d*g*h^5 - 3*b^3*c*d^2*g^
5*h + 3*a*b^2*c^3*g^2*h^4 + 3*a^2*b*d^3*g^4*h^2 + 3*a^3*c*d^2*g^2*h^4 + 3*b
^3*c^2*d*g^4*h^2 + 9*a*b^2*c*d^2*g^4*h^2 - 9*a*b^2*c^2*d*g^3*h^3 - 9*a^2*b*
c*d^2*g^3*h^3 + 9*a^2*b*c^2*d*g^2*h^4) + (x^2*(B*a*b^2*c^3*h^6*n - B*a^3*c*
d^2*h^6*n + 7*B*a^3*d^3*g*h^5*n - 7*B*b^3*c^3*g*h^5*n + 20*B*a*b^2*d^3*g^3*
h^3*n - 21*B*a^2*b*d^3*g^2*h^4*n - 20*B*b^3*c*d^2*g^3*h^3*n + 21*B*b^3*c^2*
d*g^2*h^4*n - 3*B*a*b^2*c^2*d*g*h^5*n + 3*B*a^2*b*c*d^2*g*h^5*n))/(2*(a^3*c
^3*h^6 + b^3*d^3*g^6 - a^3*d^3*g^3*h^3 - b^3*c^3*g^3*h^3 - 3*a^2*b*c^3*g*h^
5 - 3*a*b^2*d^3*g^5*h - 3*a^3*c^2*d*g*h^5 - 3*b^3*c*d^2*g^5*h + 3*a*b^2*c^3
*g^2*h^4 + 3*a^2*b*d^3*g^4*h^2 + 3*a^3*c*d^2*g^2*h^4 + 3*b^3*c^2*d*g^4*h^2
+ 9*a*b^2*c*d^2*g^4*h^2 - 9*a*b^2*c^2*d*g^3*h^3 - 9*a^2*b*c*d^2*g^3*h^3 + 9
*a^2*b*c^2*d*g^2*h^4)))/(4*g^4*h + 4*h^5*x^4 + 16*g^3*h^2*x + 16*g*h^4*x^3
+ 24*g^2*h^3*x^2) + (log(g + h*x)*(h*(6*B*a^2*b^2*d^4*g^2*n - 6*B*b^4*c^2*d
^2*g^2*n) - h^2*(4*B*a^3*b*d^4*g*n - 4*B*b^4*c^3*d*g*n) + h^3*(B*a^4*d^4*n
- B*b^4*c^4*n) - 4*B*a*b^3*d^4*g^3*n + 4*B*b^4*c*d^3*g^3*n))/(4*a^4*c^4*h^8
 + 4*b^4*d^4*g^8 + 4*a^4*d^4*g^4*h^4 + 4*b^4*c^4*g^4*h^4 + 24*a^2*b^2*c^4*g
^2*h^6 + 24*a^2*b^2*d^4*g^6*h^2 + 24*a^4*c^2*d^2*g^2*h^6 + 24*b^4*c^2*d^2*g
^6*h^2 - 16*a^3*b*c^4*g*h^7 - 16*a*b^3*d^4*g^7*h - 16*a^4*c^3*d*g*h^7 - 16*
b^4*c*d^3*g^7*h - 16*a*b^3*c^4*g^3*h^5 - 16*a^3*b*d^4*g^5*h^3 - 16*a^4*c*d^
3*g^3*h^5 - 16*b^4*c^3*d*g^5*h^3 + 64*a*b^3*c*d^3*g^6*h^2 + 64*a*b^3*c^3*d*
g^4*h^4 + 64*a^3*b*c*d^3*g^4*h^4 + 64*a^3*b*c^3*d*g^2*h^6 - 96*a*b^3*c^2*d^
2*g^5*h^3 - 96*a^2*b^2*c*d^3*g^5*h^3 - 96*a^2*b^2*c^3*d*g^3*h^5 - 96*a^3*b*
c^2*d^2*g^3*h^5 + 144*a^2*b^2*c^2*d^2*g^4*h^4) - (B*log((e*(a + b*x)^n)/(c
+ d*x)^n))/(4*h*(g^4 + h^4*x^4 + 4*g^3*h*x + 4*g*h^3*x^3 + 6*g^2*h^2*x^2))
+ (B*b^4*n*log(a + b*x))/(4*a^4*h^5 + 4*b^4*g^4*h - 16*a*b^3*g^3*h^2 + 24*a
^2*b^2*g^2*h^3 - 16*a^3*b*g*h^4) - (B*d^4*n*log(c + d*x))/(4*c^4*h^5 + 4*d^
4*g^4*h - 16*c*d^3*g^3*h^2 + 24*c^2*d^2*g^2*h^3 - 16*c^3*d*g*h^4)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**5,x)
```

```
[Out] Timed out
```

3.303 $\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 \, dx$

Optimal. Leaf size=570

$$\frac{2Bn(bc-ad)\bigl(a^2d^2h^2-abdh(3dg-ch)+b^2\bigl(c^2h^2-3cdgh+3d^2g^2\bigr)\bigr)\log\Bigl(\frac{bc-ad}{b(c+dx)}\Bigr)\bigl(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+}{3b^3d^3}$$

```
[Out] 1/3*B^2*(-a*d+b*c)^2*h^2*n^2*x/b^2/d^2+1/3*B^2*(-a*d+b*c)^3*h^2*n^2*ln((b*x
+a)/(d*x+c))/b^3/d^3+1/3*B^2*(-a*d+b*c)^3*h^2*n^2*ln(d*x+c)/b^3/d^3+2/3*B^2
*(-a*d+b*c)^2*h*(-a*d*h-2*b*c*h+3*b*d*g)*n^2*ln(d*x+c)/b^3/d^3-2/3*B*(-a*d+
b*c)*h*(-a*d*h-2*b*c*h+3*b*d*g)*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))
/b^3/d^2-1/3*B*(-a*d+b*c)*h^2*n*(d*x+c)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))
/b/d^3+2/3*B*(-a*d+b*c)*(a^2*d^2*h^2-a*b*d*h*(-c*h+3*d*g)+b^2*(c^2*h^2-3*c*
d*g*h+3*d^2*g^2))*n*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n
)))/b^3/d^3-1/3*(-a*h+b*g)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b^3/h+1/3*
(h*x+g)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/h+2/3*B^2*(-a*d+b*c)*(a^2*d^2
*h^2-a*b*d*h*(-c*h+3*d*g)+b^2*(c^2*h^2-3*c*d*g*h+3*d^2*g^2))*n^2*polylog(2,
d*(b*x+a)/b/(d*x+c))/b^3/d^3
```

Rubi [A] time = 1.29, antiderivative size = 697, normalized size of antiderivative = 1.22, number of steps used = 23, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{2B^2n^2(bg-ah)^3\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{3b^3h}-\frac{2B^2n^2(dg-ch)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3d^3h}+\frac{a^2B^2h^2n^2(bc-ad)\log(a+bx}{3b^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(3*b^2*d^2) + (B^2*(b*
c - a*d)^2*h^2*n^2*x)/(3*b^2*d^2) - (A*B*(b*c - a*d)*h^2*n*x^2)/(3*b*d) + (
A^2*(g + h*x)^3)/(3*h) - (2*A*B*(b*g - a*h)^3*n*Log[a + b*x])/(3*b^3*h) + (
a^2*B^2*(b*c - a*d)*h^2*n^2*Log[a + b*x])/(3*b^3*d) + (2*A*B*(d*g - c*h)^3*
n*Log[c + d*x])/(3*d^3*h) - (B^2*c^2*(b*c - a*d)*h^2*n^2*Log[c + d*x])/(3*b
*d^3) + (2*B^2*(b*c - a*d)^2*h*(3*b*d*g - b*c*h - a*d*h)*n^2*Log[c + d*x])/
(3*b^3*d^3) - (B^2*(b*c - a*d)*h^2*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/
(3*b*d) - (2*B^2*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*(a + b*x)*Log[(e
*(a + b*x)^n)/(c + d*x)^n])/(3*b^3*d^2) + (2*A*B*(g + h*x)^3*Log[(e*(a + b*
x)^n)/(c + d*x)^n])/(3*h) + (2*B^2*(b*g - a*h)^3*n*Log[-((b*c - a*d)/(d*(a
+ b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b^3*h) - (2*B^2*(d*g - c*h)^
3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*d^3
*h) + (B^2*(g + h*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(3*h) - (2*B^2*(
d*g - c*h)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*d^3*h) - (2*B^
2*(b*g - a*h)^3*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(3*b^3*h)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2(g+hx)^2+2AB(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right.$$

$$= \frac{A^2(g+hx)^3}{3h} + (2AB)\int (g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right.$$

$$= \frac{A^2(g+hx)^3}{3h} + \frac{2AB(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h} +$$

$$= \frac{A^2(g+hx)^3}{3h} + \frac{2AB(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h} +$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} - \frac{AB(bc-ad)h^2nx^2}{3bd}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} - \frac{AB(bc-ad)h^2nx^2}{3bd}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} - \frac{AB(bc-ad)h^2nx^2}{3bd}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2h^2n^2}{3b^2d^2}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2h^2n^2}{3b^2d^2}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2h^2n^2}{3b^2d^2}$$

Mathematica [A] time = 1.84, size = 906, normalized size = 1.59

$$\frac{-aB^2\left(3b^2g^2-3abhg+a^2h^2\right)n^2\log^2(a+bx)d^3+Bn\log(a+bx)\left(2Bc\left(3d^2g^2-3cdhg+c^2h^2\right)n\log(c+dx)b^3+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-(a*B^2*d^3*(3*b^2*g^2 - 3*a*b*g*h + a^2*h^2)*n^2*Log[a + b*x]^2) + B*n*Lo
g[a + b*x]*(2*b^3*B*c*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2)*n*Log[c + d*x] + 2*
B*(3*a*b^2*d^3*g^2 - 3*a^2*b*d^3*g*h + a^3*d^3*h^2 - b^3*c*(3*d^2*g^2 - 3*c
*d*g*h + c^2*h^2))*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(2*A*d^2*(3*b^2*g
^2 - 3*a*b*g*h + a^2*h^2) + B*(-3*a^2*d^2*h^2 + a*b*d*h*(6*d*g + c*h) + 2*b
^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n + 2*B*d^2*(3*b^2*g^2 - 3*a*b*g*h +
a^2*h^2)*Log[(e*(a + b*x)^n)/(c + d*x)^n])) + b*(-(b^2*B^2*c*(3*d^2*g^2 - 3
*c*d*g*h + c^2*h^2)*n^2*Log[c + d*x]^2) + B*n*Log[c + d*x]*(-2*A*b^2*c*(3*d
^2*g^2 - 3*c*d*g*h + c^2*h^2) + B*(2*a^2*c*d^2*h^2 - 3*b^2*c^2*h*(-2*d*g +
c*h) + a*b*d*(-6*d^2*g^2 - 6*c*d*g*h + c^2*h^2))*n - 2*b^2*B*c*(3*d^2*g^2 -
 3*c*d*g*h + c^2*h^2)*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + d*(a^2*B*d^2*h^2*
```

```
n*(-2*A + B*n)*x + a*b*B*n*(A*d^2*(-6*g^2 + 6*g*h*x + h^2*x^2) - 2*B*n*(3*d
^2*g^2 + c^2*h^2 + c*d*h*(-3*g + h*x))) + b^2*x*(B^2*c^2*h^2*n^2 + A^2*d^2*
(3*g^2 + 3*g*h*x + h^2*x^2) + A*B*c*h*n*(2*c*h - d*(6*g + h*x))) + B*(-2*a^
2*B*d^2*h^2*n*x + a*b*B*d^2*n*(-6*g^2 + 6*g*h*x + h^2*x^2) + b^2*x*(B*c*h*n
*(-6*d*g + 2*c*h - d*h*x) + 2*A*d^2*(3*g^2 + 3*g*h*x + h^2*x^2)))*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + b^2*B^2*d^2*x*(3*g^2 + 3*g*h*x + h^2*x^2)*Log[(e*
(a + b*x)^n)/(c + d*x)^n]^2)) + 2*B^2*(3*a*b^2*d^3*g^2 - 3*a^2*b*d^3*g*h +
a^3*d^3*h^2 - b^3*c*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n^2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)])/(3*b^3*d^3)
```

fricas **[F]** time = 1.14, size = 0, normalized size = 0.00

$$\text{integral}\left(A^2h^2x^2 + 2\,A^2ghx + A^2g^2 + \left(B^2h^2x^2 + 2\,B^2ghx + B^2g^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\left(ABh^2x^2 + 2\,ABghx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*h^2*x^2 + 2*A^2*g*h*x + A^2*g^2 + (B^2*h^2*x^2 + 2*B^2*g*h*x +
 B^2*g^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*(A*B*h^2*x^2 + 2*A*B*g*h*x +
 A*B*g^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac
")
```

```
[Out] Timed out
```

maple **[C]** time = 4.82, size = 22955, normalized size = 40.27

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

maxima **[B]** time = 6.79, size = 1671, normalized size = 2.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxi
ma")
```

```
[Out] 2/3*A*B*h^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^2*h^2*x^3 + 2*A*B*g*
h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^2*g*h*x^2 + 2*A*B*g^2*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A^2*g^2*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*x
+ c)/d)*A*B*g^2/e - 2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2
+ (b*c*e*n - a*d*e*n)*x/(b*d))*A*B*g*h/e + 1/3*(2*a^3*e*n*log(b*x + a)/b^3
- 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^
2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A*B*h^2/e + 1/3*(2*a^2*c*d^2*h^2*n^2 - (
6*c*d^2*g*h*n^2 - c^2*d*h^2*n^2)*a*b - (6*c*d^2*g^2*n*log(e) + (3*h^2*n^2 +
 2*h^2*n*log(e))*c^3 - 6*(g*h*n^2 + g*h*n*log(e))*c^2*d)*b^2)*B^2*log(d*x +
```

```
 c)/(b^2*d^3) + 2/3*(3*a*b^2*d^3*g^2*n^2 - 3*a^2*b*d^3*g*h*n^2 + a^3*d^3*h^
2*n^2 - (3*c*d^2*g^2*n^2 - 3*c^2*d*g*h*n^2 + c^3*h^2*n^2)*b^3)*(log(b*x + a
)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B
^2/(b^3*d^3) + 1/3*(B^2*b^3*d^3*h^2*x^3*log(e)^2 + 2*(3*c*d^2*g^2*n^2 - 3*c
^2*d*g*h*n^2 + c^3*h^2*n^2)*B^2*b^3*log(b*x + a)*log(d*x + c) - (3*c*d^2*g^
2*n^2 - 3*c^2*d*g*h*n^2 + c^3*h^2*n^2)*B^2*b^3*log(d*x + c)^2 + (a*b^2*d^3*
h^2*n*log(e) - (c*d^2*h^2*n*log(e) - 3*d^3*g*h*log(e)^2)*b^3)*B^2*x^2 - (3*
a*b^2*d^3*g^2*n^2 - 3*a^2*b*d^3*g*h*n^2 + a^3*d^3*h^2*n^2)*B^2*log(b*x + a)
^2 + ((h^2*n^2 - 2*h^2*n*log(e))*a^2*b*d^3 - 2*(c*d^2*h^2*n^2 - 3*d^3*g*h*n
*log(e))*a*b^2 - (6*c*d^2*g*h*n*log(e) - 3*d^3*g^2*log(e)^2 - (h^2*n^2 + 2*
h^2*n*log(e))*c^2*d)*b^3)*B^2*x - ((3*h^2*n^2 - 2*h^2*n*log(e))*a^3*d^3 - (
c*d^2*h^2*n^2 + 6*(g*h*n^2 - g*h*n*log(e))*d^3)*a^2*b + 2*(3*c*d^2*g*h*n^2
- c^2*d*h^2*n^2 - 3*d^3*g^2*n*log(e))*a*b^2)*B^2*log(b*x + a) + (B^2*b^3*d^
3*h^2*x^3 + 3*B^2*b^3*d^3*g*h*x^2 + 3*B^2*b^3*d^3*g^2*x)*log((b*x + a)^n)^2
 + (B^2*b^3*d^3*h^2*x^3 + 3*B^2*b^3*d^3*g*h*x^2 + 3*B^2*b^3*d^3*g^2*x)*log(
(d*x + c)^n)^2 + (2*B^2*b^3*d^3*h^2*x^3*log(e) - 2*(3*c*d^2*g^2*n - 3*c^2*d
*g*h*n + c^3*h^2*n)*B^2*b^3*log(d*x + c) + (a*b^2*d^3*h^2*n - (c*d^2*h^2*n
- 6*d^3*g*h*log(e))*b^3)*B^2*x^2 + 2*(3*a*b^2*d^3*g*h*n - a^2*b*d^3*h^2*n -
 (3*c*d^2*g*h*n - c^2*d*h^2*n - 3*d^3*g^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d
^3*g^2*n - 3*a^2*b*d^3*g*h*n + a^3*d^3*h^2*n)*B^2*log(b*x + a))*log((b*x +
a)^n) - (2*B^2*b^3*d^3*h^2*x^3*log(e) - 2*(3*c*d^2*g^2*n - 3*c^2*d*g*h*n +
c^3*h^2*n)*B^2*b^3*log(d*x + c) + (a*b^2*d^3*h^2*n - (c*d^2*h^2*n - 6*d^3*g
*h*log(e))*b^3)*B^2*x^2 + 2*(3*a*b^2*d^3*g*h*n - a^2*b*d^3*h^2*n - (3*c*d^2
*g*h*n - c^2*d*h^2*n - 3*d^3*g^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d^3*g^2*n
- 3*a^2*b*d^3*g*h*n + a^3*d^3*h^2*n)*B^2*log(b*x + a) + 2*(B^2*b^3*d^3*h^2*
x^3 + 3*B^2*b^3*d^3*g*h*x^2 + 3*B^2*b^3*d^3*g^2*x)*log((b*x + a)^n))*log((d
*x + c)^n))/(b^3*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(g+h\,x\right)^2\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2,x)
```

```
[Out] int((g + h*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.304 $\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx$

Optimal. Leaf size=294

$$\frac{Bn(bc-ad)(-adh-bch+2bdg)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{b^2d^2}-\frac{(bg-ah)^2\left(B\log\left(e(a+bx)\right.\right.}{2b^2h}$$

```
[Out] B^2*(-a*d+b*c)^2*h*n^2*ln(d*x+c)/b^2/d^2-B*(-a*d+b*c)*h*n*(b*x+a)*(A+B*ln(e
*(b*x+a)^n/((d*x+c)^n)))/b^2/d+B*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)*n*ln((-a
*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b^2/d^2-1/2*(-a*h+b*g)
^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b^2/h+1/2*(h*x+g)^2*(A+B*ln(e*(b*x+a
)^n/((d*x+c)^n)))^2/h+B^2*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)*n^2*polylog(2,d
*(b*x+a)/b/(d*x+c))/b^2/d^2
```

Rubi **[A]** time = 0.96, antiderivative size = 449, normalized size of antiderivative = 1.53, number of steps used = 20, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{B^2n^2(bg-ah)^2\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b^2h}-\frac{B^2n^2(dg-ch)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2h}-\frac{ABn(bg-ah)^2\log(a+bx)}{b^2h}+$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*h*n*x)/(b*d)) + (A^2*(g + h*x)^2)/(2*h) - (A*B*(b*g - a*
h)^2*n*Log[a + b*x])/(b^2*h) + (A*B*(d*g - c*h)^2*n*Log[c + d*x])/(d^2*h) +
 (B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/(b^2*d^2) - (B^2*(b*c - a*d)*h*n*(a
 + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*d) + (A*B*(g + h*x)^2*Log[(e
*(a + b*x)^n)/(c + d*x)^n])/h + (B^2*(b*g - a*h)^2*n*Log[-((b*c - a*d)/(d*(
a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*h) - (B^2*(d*g - c*h)^2*
n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(d^2*h)
+ (B^2*(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h) - (B^2*(d*g -
c*h)^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*h) - (B^2*(b*g - a
*h)^2*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*h)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2(g+hx)+2AB(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right.$$

$$= \frac{A^2(g+hx)^2}{2h} + (2AB)\int (g+hx)\log\left(e(a+bx)^n(c+dx)^{-}\right.$$

$$= \frac{A^2(g+hx)^2}{2h} + \frac{AB(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} +$$

$$= \frac{A^2(g+hx)^2}{2h} + \frac{AB(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} +$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a}{b^2h}$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a}{b^2h}$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a}{b^2h}$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a}{b^2h}$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a}{b^2h}$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a}{b^2h}$$

Mathematica [A] time = 0.97, size = 472, normalized size = 1.61

$$\frac{-2Bn\log(a+bx)\left(ad\left(A(adh-2bdg)+Bd(ah-2bg)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+Bn(-adh+bch-2bdg)\right)-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (a*B^2*d^2*(-2*b*g + a*h)*n^2*Log[a + b*x]^2 - 2*B*n*Log[a + b*x]*(b^2*B*c*
(-2*d*g + c*h)*n*Log[c + d*x] - B*(b*c - a*d)*(-2*b*d*g + b*c*h + a*d*h)*n*
Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(A*(-2*b*d*g + a*d*h) + B*(-2*b*d*g +
b*c*h - a*d*h)*n + B*d*(-2*b*g + a*h)*Log[(e*(a + b*x)^n)/(c + d*x)^n])) +
b*(b*B^2*c*(-2*d*g + c*h)*n^2*Log[c + d*x]^2 + 2*B*n*Log[c + d*x]*(A*b*c*(-
2*d*g + c*h) + B*(b*c^2*h - a*d*(2*d*g + c*h))*n + b*B*c*(-2*d*g + c*h)*Log
[(e*(a + b*x)^n)/(c + d*x)^n]) + d*(A*b*x*(2*A*d*g - 2*B*c*h*n + A*d*h*x) +
 2*a*B*n*(-2*A*d*g - 2*B*d*g*n + B*c*h*n + A*d*h*x) + 2*B*(a*B*d*n*(-2*g +
h*x) + b*x*(2*A*d*g - B*c*h*n + A*d*h*x))*Log[(e*(a + b*x)^n)/(c + d*x)^n]
+ b*B^2*d*x*(2*g + h*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)) + 2*B^2*(b*c -
 a*d)*(-2*b*d*g + b*c*h + a*d*h)*n^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)])/(2*b^2*d^2)
```

fricas [F] time = 0.94, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^2hx+A^2g+\left(B^2hx+B^2g\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^2+2\left(ABhx+ABg\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*h*x + A^2*g + (B^2*h*x + B^2*g)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*h*x + A*B*g)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (hx+g)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

maple [C] time = 2.71, size = 11007, normalized size = 37.44

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

maxima [B] time = 6.53, size = 903, normalized size = 3.07

$$ABhx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{2}A^2hx^2+2ABgx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2gx+\frac{2\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)ABg}{e}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxima
")
```

```
[Out] A*B*h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^2*h*x^2 + 2*A*B*g*x*log((b
*x + a)^n*e/(d*x + c)^n) + A^2*g*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A*B*g/e - (a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 +
(b*c*e*n - a*d*e*n)*x/(b*d))*A*B*h/e - (a*c*d*h*n^2 + (2*c*d*g*n*log(e) - (
h*n^2 + h*n*log(e))*c^2)*b)*B^2*log(d*x + c)/(b*d^2) + (2*a*b*d^2*g*n^2 - a
^2*d^2*h*n^2 - (2*c*d*g*n^2 - c^2*h*n^2)*b^2)*(log(b*x + a)*log((b*d*x + a*
d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/
2*(B^2*b^2*d^2*h*x^2*log(e)^2 + 2*(2*c*d*g*n^2 - c^2*h*n^2)*B^2*b^2*log(b*x
 + a)*log(d*x + c) - (2*c*d*g*n^2 - c^2*h*n^2)*B^2*b^2*log(d*x + c)^2 - (2*
a*b*d^2*g*n^2 - a^2*d^2*h*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*h*n*log(e) -
 (c*d*h*n*log(e) - d^2*g*log(e)^2)*b^2)*B^2*x + 2*((h*n^2 - h*n*log(e))*a^2
*d^2 - (c*d*h*n^2 - 2*d^2*g*n*log(e))*a*b)*B^2*log(b*x + a) + (B^2*b^2*d^2*
h*x^2 + 2*B^2*b^2*d^2*g*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*h*x^2 + 2*B^2*
b^2*d^2*g*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*h*x^2*log(e) - (2*c*d*g*n
- c^2*h*n)*B^2*b^2*log(d*x + c) + (a*b*d^2*h*n - (c*d*h*n - 2*d^2*g*log(e))
*b^2)*B^2*x + (2*a*b*d^2*g*n - a^2*d^2*h*n)*B^2*log(b*x + a))*log((b*x + a)
^n) - 2*(B^2*b^2*d^2*h*x^2*log(e) - (2*c*d*g*n - c^2*h*n)*B^2*b^2*log(d*x +
 c) + (a*b*d^2*h*n - (c*d*h*n - 2*d^2*g*log(e))*b^2)*B^2*x + (2*a*b*d^2*g*n
 - a^2*d^2*h*n)*B^2*log(b*x + a) + (B^2*b^2*d^2*h*x^2 + 2*B^2*b^2*d^2*g*x)*
log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (g+h\,x)\,\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2,x)
```

```
[Out] int((g + h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.305 $\int \left(A + B \log \left(e(a + bx)^n (c + dx)^{-n}\right)\right)^2 \, dx$

Optimal. Leaf size=137

$$\frac{2Bn(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{b}+\frac{2B^2}{}$$

```
[Out] 2*B*(-a*d+b*c)*n*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))
/b/d+(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b+2*B^2*(-a*d+b*c)*n^2*pol
ylog(2,d*(b*x+a)/b/(d*x+c))/b/d
```

Rubi [**A**] time = 0.32, antiderivative size = 195, normalized size of antiderivative = 1.42, number of steps used = 10, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {6742, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{2ABn(bc-ad)\log(c+dx)}{bd}+\frac{B^2(a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] A^2*x - (2*A*B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (2*A*B*(a + b*x)*Log[(e*
(a + b*x)^n)/(c + d*x)^n])/b + (2*B^2*(b*c - a*d)*n*Log[(b*c - a*d)/(b*(c +
 d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (B^2*(a + b*x)*Log[(e*(a
+ b*x)^n)/(c + d*x)^n]^2)/b + (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (d*(a + b*x
))/(b*(c + d*x))])/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \Big(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\Big)^2\,dx = \int \Big(A^2+2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)+B^2\log^2\big(e(a+bx)^n(c$$

$$= A^2x+(2AB)\int \log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx+B^2\int \log^2\big(e(a+$$

$$= A^2x+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{B^2(a+bx)\log^2}{}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\big(e(a+bx)^n}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\big(e(a+bx)^n}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\big(e(a+bx)^n}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\big(e(a+bx)^n}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\big(e(a+bx)^n}{b}$$

Mathematica [A] time = 0.16, size = 217, normalized size = 1.58

$$\frac{2ABd(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)-2ABn(bc-ad)\log(c+dx)+B^2n(bc-ad)\left(2n\mathrm{Li}_2\left(\frac{b(c+dx)}{bc-ad}\right)-\log\Big(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (A^2*b*d*x - 2*A*B*(b*c - a*d)*n*Log[c + d*x] + 2*A*B*d*(a + b*x)*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + B^2*d*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
2 + B^2*(b*c - a*d)*n*(-(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*n*Log[(d*(a + b*
x))/(-(b*c) + a*d)] - 2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + n*Log[(b*c - a*d
)/(b*c + b*d*x)])) + 2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(b*d)
```

fricas [**F**] time = 1.31, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(B^{2}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)^{2}+2\,AB\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A^{2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d*
x + c)^n) + A^2, x)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

maple [**C**] time = 1.32, size = 4749, normalized size = 34.66

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] I*A*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*x+I*x*ln((b*x+a)
^n)*B^2*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*B^2*Pi^2
*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*B^
2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-
1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^4+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^5-1/4*B^2*Pi^2*x*csgn(I*e)^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^4-1/4*
B^2*Pi^2*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^6+B^2*a/b*ln((b*x+a)^n)^2+2*B*x*
ln((b*x+a)^n)*A-1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n
/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B^2*ln(e)*Pi*csgn(I*e)*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*x-I*B^2*ln(e)*Pi*csgn(I*(b*x+a)^n)*csgn(I
/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*x-I*A*B*Pi*csgn(I*e)*csgn(I*(b*
x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)*x+2*A*B*ln(e)*x-2*n^2*B
^2*c/d+2*x*ln((b*x+a)^n)*B^2*ln(e)+B^2*ln(e)^2*x-I*B^2*c*n/d*ln(d*x+c)*Pi*c
sgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I/b*B^2*ln(b
*x+a)*Pi*a*n*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I/b*B^2*ln(b*x+a)*
Pi*a*n*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+B^2*x*ln((d*x+c)^n
)^2+B^2*x*ln((b*x+a)^n)^2-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^6-I*
x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*x*ln((b*x+a)^n)*B^
2*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*B^2*ln(e)*Pi*csgn(I*(b*x+a)^n/((d*
x+c)^n))^3*x-I*B^2*ln(e)*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3*x-I*A*B*Pi*cs
gn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*x-I*x*ln(
(b*x+a)^n)*B^2*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)
^n)*(b*x+a)^n)-I*x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n
```

```
))*csgn(I*(b*x+a)^n/((d*x+c)^n))+(-2*B^2*ln((b*x+a)^n)*x-B*(-I*B*Pi*b*d*x*c
sgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*
Pi*b*d*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*b*d*x*csgn(I*(b
*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*b*d*x*csg
n(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b*d*x*csgn(I/((d*x+c)
^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*b*d*x*csgn(I*(b*x+a)^n/((d*x+c)
^n))^3+I*B*Pi*b*d*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^2-I*B*Pi*b*d*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(e)*b*d*x+2*B
*a*d*n*ln(b*x+a)-2*B*ln(d*x+c)*b*c*n+2*A*b*d*x)/b/d)*ln((d*x+c)^n)-1/2*B^2*
Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*B^2*P
i^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a
)^n)^2+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^3-B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^4-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n)^2*csgn(I/
((d*x+c)^n))^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*B^2*Pi^2*x*csgn(I*(b*x+a
)^n)^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*B^2*Pi^2*x*c
sgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-B^2*
Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^
4+2/b*A*B*ln(b*x+a)*a*n-I*A*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*x-I*A*B*Pi
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3*x-2/d*n*B^2*ln((b*x+a)^n)*c*ln(d*x+c)+I*
x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2+I*x*ln((b*x+a)^n)*B^2*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^2+I*x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^
n))^2+A^2*x-2*B*c*n/d*ln(d*x+c)*A+2/b*B^2*a*n^2*ln(b*x+a)*ln((-a*d+b*c+(b*x
+a)*d)/(-a*d+b*c))+2/b*B^2*ln(b*x+a)*ln(e)*a*n-2*B^2*c*n/d*ln(d*x+c)*ln(e)+
I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))+I*A*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^2*x+I*A*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^2*x-I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*e)*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*
x+a)^n/((d*x+c)^n))^2-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I/((d*x+c)^n))*csgn(I*(
b*x+a)^n/((d*x+c)^n))^2+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*B^2*Pi^2*x*cs
gn(I*e)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^2+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/4*B^2*Pi^2
*x*csgn(I/((d*x+c)^n))^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^4+1/2*B^2*Pi^2*x*csg
n(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^5+2*B^2*a*n^2/b-I*B^2*ln(e)*
Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)*
x-I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I/b*B^2*ln(b*x
+a)*Pi*a*n*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+2*n^2*B^2*c/d*ln(d*x+c)*ln((b*(d
*x+c)+a*d-b*c)/(a*d-b*c))+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^5-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n)^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^
4+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^5-n^2*B^2*
c/d*ln(d*x+c)^2-1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^
n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*cs
gn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*B^2*Pi^
2*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n
)*(b*x+a)^n)^2+1/2*B^2*Pi^2*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)
^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I/((
d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*
(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+2*n^2*B^2*c/d*dilo
g((b*(d*x+c)+a*d-b*c)/(a*d-b*c))+2/b*B^2*a*n^2*dilog((-a*d+b*c+(b*x+a)*d)/(
-a*d+b*c))+2*n^2*B^2/b*a*ln(b*(d*x+c)+a*d-b*c)-2*B^2/b*a*n*ln((b*x+a)^n)+I*
B^2*ln(e)*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*x+I*B^2*ln(e
)*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*x+I*B^2*ln(e)*Pi*c
```

```
sgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*x+I*A*B*Pi*c
sgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*x-1/4*B^2*Pi^2*x*csgn(I*e)^2*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*B^2*Pi^2
*x*csgn(I*e)^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^3-1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))^4*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)+I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+
I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*B^2*Pi^2*x*c
sgn(I*e)*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)
^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)^2-I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*e)*csgn(I*(b
*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,ABx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2x+B^2\left(\frac{2\,bcn^2\log(bx+a)\log(dx+c)-bcn^2\log(dx+c)^2+bdx\log\left((bx+a)^n\right)^2+b}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxima")
```

```
[Out] 2*A*B*x*log((b*x + a)^n*e/(d*x + c)^n) + A^2*x + B^2*((2*b*c*n^2*log(b*x +
a)*log(d*x + c) - b*c*n^2*log(d*x + c)^2 + b*d*x*log((b*x + a)^n)^2 + b*d*x
*log((d*x + c)^n)^2 + 2*(a*d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x*lo
g(e))*log((b*x + a)^n) - 2*(a*d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x
*log((b*x + a)^n) + b*d*x*log(e))*log((d*x + c)^n))/(b*d) - integrate(-(b^2
*d*x^2*log(e)^2 + a*b*c*log(e)^2 - ((2*n*log(e) - log(e)^2)*b^2*c - (2*n*lo
g(e) + log(e)^2)*a*b*d)*x - 2*(b^2*c*n^2*x + 2*a*b*c*n^2 - a^2*d*n^2)*log(b
*x + a))/(b^2*d*x^2 + a*b*c + (b^2*c + a*b*d)*x), x)) + 2*(a*e*n*log(b*x +
a)/b - c*e*n*log(d*x + c)/d)*A*B/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\left(A+B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.306 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{g+hx}\,dx$

Optimal. Leaf size=301

$$\frac{2Bn\operatorname{Li}_2\left(\frac{(dg-ch)(a+bx)}{(bg-ah)(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h}+\frac{\log\left(1-\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right.}{h}$$

```
[Out] -ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/h+(A+B*ln(e*(
b*x+a)^n/((d*x+c)^n)))^2*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/h-2*B*
n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,d*(b*x+a)/b/(d*x+c))/h+2*B*n*
(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(
d*x+c))/h+2*B^2*n^2*polylog(3,d*(b*x+a)/b/(d*x+c))/h-2*B^2*n^2*polylog(3,(-
c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/h
```

Rubi [A] time = 0.82, antiderivative size = 473, normalized size of antiderivative = 1.57, number of steps used = 16, number of rules used = 10, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {6742, 2494, 2394, 2393, 2391, 2489, 2488, 2506, 6610, 2503}

$$-\frac{2ABn\operatorname{PolyLog}\left(2,\frac{b(g+hx)}{bg-ah}\right)}{h}+\frac{2B^2n\log\left(e(a+bx)^n(c+dx)^{-n}\right)\operatorname{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{h}-2B^2n\operatorname{PolyLog}\left(2\right.$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x),x]
```

```
[Out] -((B^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/h
) + (A^2*Log[g + h*x])/h - (2*A*B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g
 + h*x])/h + (2*A*B*n*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/h + (
2*A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/h + (B^2*Log[(e*(a + b
*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])
/h - (2*A*B*n*PolyLog[2, (b*(g + h*x))/(b*g - a*h)])/h + (2*A*B*n*PolyLog[2
, (d*(g + h*x))/(d*g - c*h)])/h - (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]
*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/h + (2*B^2*n*Log[(e*(a + b*x)^n
)/(c + d*x)^n]*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x
))])/h + (2*B^2*n^2*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/h - (2*B^2*n
^2*PolyLog[3, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2489

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r]^s/(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[Log[e
*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a
, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0
] && NeQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 1]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{g+hx}\,dx = \int \left(\frac{A^2}{g+hx} + \frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx} + \frac{B^2\log^2\left(e(a+bx}{g+h}\right.$$

$$= \frac{A^2\log(g+hx)}{h} + (2AB)\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\,dx + B^2\int$$

$$= \frac{A^2\log(g+hx)}{h} + \frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log(g+hx)}{h} + $$

$$= -\frac{B^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} + \frac{A^2\log(g+hx)}{h} - $$

$$= -\frac{B^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} + \frac{A^2\log(g+hx)}{h} - $$

$$= -\frac{B^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} + \frac{A^2\log(g+hx)}{h} - $$

Mathematica [B] time = 0.49, size = 1082, normalized size = 3.59

$$\frac{-2n\left(-n\log(a+bx)+n\log(c+dx)+\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\left(\log(c+dx)\log\left(\frac{d(g+hx)}{dg-ch}\right)+\text{Li}_2\left(\frac{h(c+dx)}{ch-dg}\right)\right)B}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x),x]
```

```
[Out] ((A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)
^n]))^2*Log[g + h*x] + 2*B*n*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + L
og[(e*(a + b*x)^n)/(c + d*x)^n]))*(Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*
h)] + PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)]) - 2*A*B*n*(Log[c + d*x]*Log
[(d*(g + h*x))/(d*g - c*h)] + PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)]) - 2
*B^2*n*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^
n])*(Log[c + d*x]*Log[(d*(g + h*x))/(d*g - c*h)] + PolyLog[2, (h*(c + d*x))
/(-(d*g) + c*h)]) + B^2*n^2*(Log[a + b*x]^2*Log[(b*(g + h*x))/(b*g - a*h)]
+ 2*Log[a + b*x]*PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)] - 2*PolyLog[3, (h
*(a + b*x))/(-(b*g) + a*h)]) + B^2*n^2*(Log[c + d*x]^2*Log[(d*(g + h*x))/(d
*g - c*h)] + 2*Log[c + d*x]*PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)] - 2*Po
lyLog[3, (h*(c + d*x))/(-(d*g) + c*h)]) - 2*B^2*n^2*(Log[a + b*x]*Log[c + d
*x]*Log[(b*(g + h*x))/(b*g - a*h)] + (Log[(h*(c + d*x))/(-(d*g) + c*h)]*(-2
*Log[a + b*x] + Log[(h*(c + d*x))/(-(d*g) + c*h)])*(Log[(b*(g + h*x))/(b*g
- a*h)] - Log[(d*(g + h*x))/(d*g - c*h)]))/2 + Log[(h*(c + d*x))/(-(d*g) +
c*h)]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*(-Log[(b*(g + h*
x))/(b*g - a*h)] + Log[(d*(g + h*x))/(d*g - c*h)]) + (Log[((b*g - a*h)*(c +
 d*x))/((d*g - c*h)*(a + b*x))]^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))] + Log[
(b*(g + h*x))/(b*g - a*h)] - Log[((-(b*c) + a*d)*(g + h*x))/((d*g - c*h)*(a
 + b*x))]))/2 + (Log[c + d*x] - Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a
 + b*x))])*PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)] + (Log[a + b*x] + Log[(
(b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*PolyLog[2, (h*(c + d*x))/(
-(d*g) + c*h)] + Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*(Poly
Log[2, (b*(c + d*x))/(d*(a + b*x))] - PolyLog[2, ((b*g - a*h)*(c + d*x))/((
d*g - c*h)*(a + b*x))]) - PolyLog[3, (h*(a + b*x))/(-(b*g) + a*h)] - PolyLo
g[3, (h*(c + d*x))/(-(d*g) + c*h)] - PolyLog[3, (b*(c + d*x))/(d*(a + b*x))
] + PolyLog[3, ((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]))/h
```

fricas [F] time = 0.87, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^2}{hx+g}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(h*x + g), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(h*x + g), x)
```

maple [F] time = 2.63, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\,(bx+a)^n\,(dx+c)^{-n}\right) + A\right)^2}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{A^2\log\left(hx+g\right)}{h} + \int \frac{B^2\log\left((bx+a)^n\right)^2 + B^2\log\left((dx+c)^n\right)^2 + B^2\log(e)^2 + 2\,AB\log(e) + 2\left(B^2\log(e) + AB\right)}{hx+g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x, algorithm="maxima
")
```

```
[Out] A^2*log(h*x + g)/h + integrate((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^
n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log(e) + A*B)*log((b*x + a)^n)
- 2*(B^2*log((b*x + a)^n) + B^2*log(e) + A*B)*log((d*x + c)^n))/(h*x + g),
x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^2}{g+h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(g + h*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(g + h*x), x)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(h*x+g),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.307 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{(g+hx)^2}\,dx$

Optimal. Leaf size=208

$$\frac{2Bn(bc-ad)\log\left(1-\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(bg-ah)(dg-ch)}+\frac{(a+bx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+\right.}{(g+hx)(bg-ah)}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*h+b*g)/(h*x+g)+2*B*(-a*d+b*
c)*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(
d*x+c))/(-a*h+b*g)/(-c*h+d*g)+2*B^2*(-a*d+b*c)*n^2*polylog(2,(-c*h+d*g)*(b*
x+a)/(-a*h+b*g)/(d*x+c))/(-a*h+b*g)/(-c*h+d*g)
```

Rubi [A] time = 0.41, antiderivative size = 343, normalized size of antiderivative = 1.65, number of steps used = 10, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$, Rules used = {6742, 2490, 36, 31, 2503, 2502, 2315}

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)(bg-ah)}-\frac{2ABn(bc-ad)\log(c+d}{(bg-ah)(dg-ch)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^2,x]
```

```
[Out] -(A^2/(h*(g + h*x))) - (2*A*B*(b*c - a*d)*n*Log[c + d*x])/((b*g - a*h)*(d*g
 - c*h)) + (2*A*B*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a*h)*
(g + h*x)) + (B^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*g - a*h
)*(g + h*x)) + (2*A*B*(b*c - a*d)*n*Log[g + h*x])/((b*g - a*h)*(d*g - c*h))
 + (2*B^2*(b*c - a*d)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[((b*c - a*d)*(
g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h)) + (2*B^2*(b*c
 - a*d)*n^2*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))]
)/((b*g - a*h)*(d*g - c*h))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(g+hx)^2}\,dx = \int \left(\frac{A^2}{(g+hx)^2}+\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}+\frac{B^2\log^2\left(e(a+\right.}{(g+}\right.$$

$$= -\frac{A^2}{h(g+hx)}+(2AB)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\,dx+B^2\int\frac{\log}{}$$

$$= -\frac{A^2}{h(g+hx)}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}+\frac{B^2(a+b}{}$$

$$= -\frac{A^2}{h(g+hx)}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}+\frac{B^2(a+b}{}$$

$$= -\frac{A^2}{h(g+hx)}-\frac{2AB(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{2AB(a+bx)\log\left(e(a\right.}{(bg-ah)(}$$

$$= -\frac{A^2}{h(g+hx)}-\frac{2AB(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{2AB(a+bx)\log\left(e(a\right.}{(bg-ah)(}$$

Mathematica [B] time = 1.30, size = 3460, normalized size = 16.63

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^2,x]
```

```
[Out] (-(A^2*b*d*g^2) + A^2*b*c*g*h + a*A^2*d*g*h - a*A^2*c*h^2 + 2*A*b*B*d*g^2*n
*Log[a + b*x] - 2*A*b*B*c*g*h*n*Log[a + b*x] + 2*A*b*B*d*g*h*n*x*Log[a + b*
x] - 2*A*b*B*c*h^2*n*x*Log[a + b*x] - b*B^2*d*g^2*n^2*Log[a + b*x]^2 + b*B^
2*c*g*h*n^2*Log[a + b*x]^2 - b*B^2*d*g*h*n^2*x*Log[a + b*x]^2 + b*B^2*c*h^2
*n^2*x*Log[a + b*x]^2 - 2*A*b*B*d*g^2*n*Log[c + d*x] + 2*a*A*B*d*g*h*n*Log[
c + d*x] - 2*A*b*B*d*g*h*n*x*Log[c + d*x] + 2*a*A*B*d*h^2*n*x*Log[c + d*x]
+ 2*b*B^2*d*g^2*n^2*Log[a + b*x]*Log[c + d*x] - 2*a*B^2*d*g*h*n^2*Log[a + b
*x]*Log[c + d*x] + 2*b*B^2*d*g*h*n^2*x*Log[a + b*x]*Log[c + d*x] - 2*a*B^2*
d*h^2*n^2*x*Log[a + b*x]*Log[c + d*x] - b*B^2*d*g^2*n^2*Log[c + d*x]^2 + a*
B^2*d*g*h*n^2*Log[c + d*x]^2 - b*B^2*d*g*h*n^2*x*Log[c + d*x]^2 + a*B^2*d*h
^2*n^2*x*Log[c + d*x]^2 - 2*b*B^2*c*g*h*n^2*Log[a + b*x]*Log[(h*(c + d*x))/
(-(d*g) + c*h)] + 2*a*B^2*d*g*h*n^2*Log[a + b*x]*Log[(h*(c + d*x))/(-(d*g)
+ c*h)] - 2*b*B^2*c*h^2*n^2*x*Log[a + b*x]*Log[(h*(c + d*x))/(-(d*g) + c*h)
] + 2*a*B^2*d*h^2*n^2*x*Log[a + b*x]*Log[(h*(c + d*x))/(-(d*g) + c*h)] + b*
B^2*c*g*h*n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]^2 - a*B^2*d*g*h*n^2*Log[(h*
(c + d*x))/(-(d*g) + c*h)]^2 + b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g)
+ c*h)]^2 - a*B^2*d*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]^2 - 2*b*B^2
*c*g*h*n^2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[((b*g - a*h)*(c + d*x))/((
d*g - c*h)*(a + b*x))] + 2*a*B^2*d*g*h*n^2*Log[(-(b*c) + a*d)/(d*(a + b*x))
]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))] - 2*b*B^2*c*h^2*n^2*
x*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h
)*(a + b*x))] + 2*a*B^2*d*h^2*n^2*x*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(
(b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))] - 2*b*B^2*c*g*h*n^2*Log[(h*
(c + d*x))/(-(d*g) + c*h)]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*
x))] + 2*a*B^2*d*g*h*n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[((b*g - a*h)
*(c + d*x))/((d*g - c*h)*(a + b*x))] - 2*b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x)
)/(-(d*g) + c*h)]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))] + 2*
a*B^2*d*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[((b*g - a*h)*(c + d
*x))/((d*g - c*h)*(a + b*x))] + b*B^2*c*g*h*n^2*Log[((b*g - a*h)*(c + d*x))
/((d*g - c*h)*(a + b*x))]^2 - a*B^2*d*g*h*n^2*Log[((b*g - a*h)*(c + d*x))/(
(d*g - c*h)*(a + b*x))]^2 + b*B^2*c*h^2*n^2*x*Log[((b*g - a*h)*(c + d*x))/(
(d*g - c*h)*(a + b*x))]^2 - a*B^2*d*h^2*n^2*x*Log[((b*g - a*h)*(c + d*x))/(
(d*g - c*h)*(a + b*x))]^2 - 2*A*b*B*d*g^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]
+ 2*A*b*B*c*g*h*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*a*A*B*d*g*h*Log[(e*(a
+ b*x)^n)/(c + d*x)^n] - 2*a*A*B*c*h^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2
*b*B^2*d*g^2*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b*B^2*c*g*
h*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*b*B^2*d*g*h*n*x*Log[a
 + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b*B^2*c*h^2*n*x*Log[a + b*x]*L
og[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b*B^2*d*g^2*n*Log[c + d*x]*Log[(e*(a +
b*x)^n)/(c + d*x)^n] + 2*a*B^2*d*g*h*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n] - 2*b*B^2*d*g*h*n*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 + 2*a*B^2*d*h^2*n*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - b*B^2*
d*g^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + b*B^2*c*g*h*Log[(e*(a + b*x)^n)/
(c + d*x)^n]^2 + a*B^2*d*g*h*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - a*B^2*c*h
^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 2*A*b*B*d*g^2*n*Log[(b*(g + h*x))/(
b*g - a*h)] + 2*A*b*B*c*g*h*n*Log[(b*(g + h*x))/(b*g - a*h)] - 2*A*b*B*d*g*
h*n*x*Log[(b*(g + h*x))/(b*g - a*h)] + 2*A*b*B*c*h^2*n*x*Log[(b*(g + h*x))/
(b*g - a*h)] + 2*b*B^2*d*g^2*n^2*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)
] - 2*a*B^2*d*g*h*n^2*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*b*B^2
*d*g*h*n^2*x*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] - 2*a*B^2*d*h^2*n^
2*x*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] - 2*b*B^2*d*g^2*n^2*Log[(h*
(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*b*B^2*c*g*h*n
^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*x))/(b*g - a*h)] - 2*b*B
^2*d*g*h*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*x))/(b*g - a
*h)] + 2*b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*
x))/(b*g - a*h)] - 2*b*B^2*d*g^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[(b*
(g + h*x))/(b*g - a*h)] + 2*b*B^2*c*g*h*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*
Log[(b*(g + h*x))/(b*g - a*h)] - 2*b*B^2*d*g*h*n*x*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*b*B^2*c*h^2*n*x*Log[(e*(a + b*x
```

```
)^n)/(c + d*x)^n]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*A*b*B*d*g^2*n*Log[(d*(
g + h*x))/(d*g - c*h)] - 2*a*A*B*d*g*h*n*Log[(d*(g + h*x))/(d*g - c*h)] + 2
*A*b*B*d*g*h*n*x*Log[(d*(g + h*x))/(d*g - c*h)] - 2*a*A*B*d*h^2*n*x*Log[(d*
(g + h*x))/(d*g - c*h)] - 2*b*B^2*d*g^2*n^2*Log[a + b*x]*Log[(d*(g + h*x))/
(d*g - c*h)] + 2*a*B^2*d*g*h*n^2*Log[a + b*x]*Log[(d*(g + h*x))/(d*g - c*h)
] - 2*b*B^2*d*g*h*n^2*x*Log[a + b*x]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*a*B
^2*d*h^2*n^2*x*Log[a + b*x]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*b*B^2*d*g^2*
n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(d*(g + h*x))/(d*g - c*h)] - 2*b*
B^2*c*g*h*n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(d*(g + h*x))/(d*g - c*
h)] + 2*b*B^2*d*g*h*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(d*(g + h*x
))/(d*g - c*h)] - 2*b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log
[(d*(g + h*x))/(d*g - c*h)] + 2*b*B^2*d*g^2*n*Log[(e*(a + b*x)^n)/(c + d*x)
^n]*Log[(d*(g + h*x))/(d*g - c*h)] - 2*a*B^2*d*g*h*n*Log[(e*(a + b*x)^n)/(c
 + d*x)^n]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*b*B^2*d*g*h*n*x*Log[(e*(a + b
*x)^n)/(c + d*x)^n]*Log[(d*(g + h*x))/(d*g - c*h)] - 2*a*B^2*d*h^2*n*x*Log[
(e*(a + b*x)^n)/(c + d*x)^n]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*B^2*(b*c -
a*d)*h*n^2*(g + h*x)*PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)] - 2*B^2*(b*c
- a*d)*h*n^2*(g + h*x)*PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)] - 2*b*B^2*c
*g*h*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 2*a*B^2*d*g*h*n^2*PolyLo
g[2, (b*(c + d*x))/(d*(a + b*x))] - 2*b*B^2*c*h^2*n^2*x*PolyLog[2, (b*(c +
d*x))/(d*(a + b*x))] + 2*a*B^2*d*h^2*n^2*x*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))])/(h*(-(b*g) + a*h)*(-(d*g) + c*h)*(g + h*x))
```

fricas [F] time = 1.03, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{B^{2}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)^{2}+2\,AB\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A^{2}}{h^{2}x^{2}+2\,ghx+g^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(h^2*x^2 + 2*g*h*x + g^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{2}}{\left(hx+g\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(h*x + g)^2, x)
```

maple [F] time = 4.45, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+A\right)^{2}}{\left(hx+g\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-B^2\left(\frac{\log\left((dx+c)^n\right)^2}{h^2x+gh} + \int -\frac{dhx\log(e)^2 + ch\log(e)^2 + (dhx+ch)\log\left((bx+a)^n\right)^2 + 2\left(dhx\log(e)+ch\log(e)\right)\mathrm{lo}}{dh^3x^3+cg^2h+\left(2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x, algorithm="maxi
ma")
```

```
[Out] -B^2*(log((d*x + c)^n)^2/(h^2*x + g*h) + integrate(-(d*h*x*log(e)^2 + c*h*l
og(e)^2 + (d*h*x + c*h)*log((b*x + a)^n)^2 + 2*(d*h*x*log(e) + c*h*log(e))*
log((b*x + a)^n) + 2*(d*g*n + (h*n - h*log(e))*d*x - c*h*log(e) - (d*h*x +
c*h)*log((b*x + a)^n))*log((d*x + c)^n))/(d*h^3*x^3 + c*g^2*h + (2*d*g*h^2
+ c*h^3)*x^2 + (d*g^2*h + 2*c*g*h^2)*x), x)) + 2*(b*e*n*log(b*x + a)/(b*g*h
 - a*h^2) - d*e*n*log(d*x + c)/(d*g*h - c*h^2) - (b*c*e*n - a*d*e*n)*log(h*
x + g)/((d*g*h - c*h^2)*a - (d*g^2 - c*g*h)*b))*A*B/e - 2*A*B*log((b*x + a)
^n*e/(d*x + c)^n)/(h^2*x + g*h) - A^2/(h^2*x + g*h)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)^2}{{\left(g+h\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(g + h*x)^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(g + h*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(h*x+g)**2,x)
```

```
[Out] Timed out
```

3.308 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^2}{(g+hx)^3}\,dx$

Optimal. Leaf size=393

$$\frac{b^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{2h(bg-ah)^2}+\frac{Bhn(a+bx)(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(g+hx)(bg-ah)^2(dg-ch)}+\frac{Bn(bc-ad}{}$$

```
[Out] B*(-a*d+b*c)*h*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(-a*h+b*g)^2/(-c
*h+d*g)/(h*x+g)+1/2*b^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/h/(-a*h+b*g)^2-
1/2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/h/(h*x+g)^2+B^2*(-a*d+b*c)^2*h*n^2*
ln((h*x+g)/(d*x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2+B*(-a*d+b*c)*(-a*d*h-b*c*h+2*
b*d*g)*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*
g)/(d*x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2+B^2*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)
*n^2*polylog(2,(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/(-a*h+b*g)^2/(-c*h+d*
g)^2
```

Rubi [B] time = 1.63, antiderivative size = 968, normalized size of antiderivative = 2.46, number of steps used = 29, number of rules used = 16, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.485, Rules used = {6742, 2492, 72, 2514, 2488, 2411, 2343, 2333, 2315, 2490, 36, 31, 2494, 2394, 2393, 2391}

$$-\frac{A^2}{2h(g+hx)^2}+\frac{b^2Bn\log(a+bx)A}{h(bg-ah)^2}-\frac{Bd^2n\log(c+dx)A}{h(dg-ch)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)A}{h(g+hx)^2}+\frac{B(bc-ad)(2bdg-b}{(bg-ah}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^3,x]
```

```
[Out] -A^2/(2*h*(g + h*x)^2) - (A*B*(b*c - a*d)*n)/((b*g - a*h)*(d*g - c*h)*(g +
h*x)) + (A*b^2*B*n*Log[a + b*x])/(h*(b*g - a*h)^2) - (A*B*d^2*n*Log[c + d*x
])/(h*(d*g - c*h)^2) - (B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/((b*g - a*h)^
2*(d*g - c*h)^2) - (A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(g + h*x)^2) +
 (B^2*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a
*h)^2*(d*g - c*h)*(g + h*x)) - (b^2*B^2*n*Log[-((b*c - a*d)/(d*(a + b*x)))]
*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(b*g - a*h)^2) + (B^2*d^2*n*Log[(b*c
- a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(d*g - c*h)^2) -
 (B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h*(g + h*x)^2) + (A*B*(b*c - a
*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2)
 + (B^2*(b*c - a*d)^2*h*n^2*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) - (
B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[-((h*(a + b*x))/(b*g - a*
h))]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d*
g - b*c*h - a*d*h)*n^2*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/((b*
g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2)
+ (B^2*d^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(h*(d*g - c*h)^2) -
 (B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog[2, (b*(g + h*x))/(b
*g - a*h)])/((b*g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d*g - b*c
*h - a*d*h)*n^2*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/((b*g - a*h)^2*(d*g
- c*h)^2) + (b^2*B^2*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(h*(b*g
 - a*h)^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
```

```
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2}{(g+hx)^3}\,dx = \int\Bigg(\frac{A^2}{(g+hx)^3}+\frac{2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}+\frac{B^2\log^2\left(e(a+bx\right.}{(g+h}$$

$$= -\frac{A^2}{2h(g+hx)^2}+(2AB)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\,dx+B^2\int\frac{\log^2}{}$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h(g+hx)^2}-\frac{B^2\log^2\left(e(a+bx)^n\right.}{2h(g+hx}$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h(g+hx)^2}-\frac{B^2\log^2\left(e(a+bx)^n\right.}{2h(g+hx}$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)}+\frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2}-$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)}+\frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2}-$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)}+\frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2}-$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)}+\frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2}-$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)}+\frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2}-$$

$$= -\frac{A^2}{2h(g+hx)^2}-\frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)}+\frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2}-$$

Mathematica [B] time = 6.46, size = 15406, normalized size = 39.20

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^3,x]
```

```
[Out] Result too large to show
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2}{h^3x^3+3\,gh^2x^2+3\,g^2hx+g^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*h*x + g^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{\left(hx+g\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(h*x + g)^3, x)
```

maple [F] time = 1.96, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+A\right)^2}{\left(hx+g\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}B^2\left(\frac{\log\left(\left(dx+c\right)^n\right)^2}{h^3x^2+2gh^2x+g^2h}+2\int -\frac{dhx\log(e)^2+ch\log(e)^2+(dhx+ch)\log\left(\left(bx+a\right)^n\right)^2+2\left(dhx\log(e)+c\right.}{dh^4x^4+cg^3h+\left(\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x, algorithm="maxi
ma")
```

```
[Out] -1/2*B^2*(log((d*x + c)^n)^2/(h^3*x^2 + 2*g*h^2*x + g^2*h) + 2*integrate(-(
d*h*x*log(e)^2 + c*h*log(e)^2 + (d*h*x + c*h)*log((b*x + a)^n)^2 + 2*(d*h*x
*log(e) + c*h*log(e))*log((b*x + a)^n) + (d*g*n + (h*n - 2*h*log(e))*d*x -
2*c*h*log(e) - 2*(d*h*x + c*h)*log((b*x + a)^n))*log((d*x + c)^n))/(d*h^4*x
^4 + c*g^3*h + (3*d*g*h^3 + c*h^4)*x^3 + 3*(d*g^2*h^2 + c*g*h^3)*x^2 + (d*g
^3*h + 3*c*g^2*h^2)*x), x)) + (b^2*e*n*log(b*x + a)/(b^2*g^2*h - 2*a*b*g*h^
2 + a^2*h^3) - d^2*e*n*log(d*x + c)/(d^2*g^2*h - 2*c*d*g*h^2 + c^2*h^3) - (
2*a*b*d^2*e*g*n - a^2*d^2*e*h*n - (2*c*d*e*g*n - c^2*e*h*n)*b^2)*log(h*x +
g)/((d^2*g^2*h^2 - 2*c*d*g*h^3 + c^2*h^4)*a^2 - 2*(d^2*g^3*h - 2*c*d*g^2*h^
2 + c^2*g*h^3)*a*b + (d^2*g^4 - 2*c*d*g^3*h + c^2*g^2*h^2)*b^2) + (b*c*e*n
- a*d*e*n)/((d*g^2*h - c*g*h^2)*a - (d*g^3 - c*g^2*h)*b + ((d*g*h^2 - c*h^3
)*a - (d*g^2*h - c*g*h^2)*b)*x))*A*B/e - A*B*log((b*x + a)^n*e/(d*x + c)^n)
/(h^3*x^2 + 2*g*h^2*x + g^2*h) - 1/2*A^2/(h^3*x^2 + 2*g*h^2*x + g^2*h)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A+B\,\ln\left(\frac{e\,\left(a+b\,x\right)^n}{\left(c+d\,x\right)^n}\right)\right)^2}{\left(g+h\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(g + h*x)^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^2/(g + h*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(h*x+g)**3,x)
```

```
[Out] Timed out
```

3.309 $\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx$

Optimal. Leaf size=875

$$-\frac{B^3h^2n^3\log(c+dx)(bc-ad)^3}{b^3d^3}-\frac{B^2h^2n^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)(bc-ad)^3}{b^3d^3}+B^3h^2n$$

```
[Out] -B^3*(-a*d+b*c)^3*h^2*n^3*ln(d*x+c)/b^3/d^3+B^2*(-a*d+b*c)^2*h^2*n^2*(b*x+a
)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/b^3/d^2-2*B^2*(-a*d+b*c)^2*h*(-a*d*h-2*
b*c*h+3*b*d*g)*n^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)
))/b^3/d^3-B*(-a*d+b*c)*h*(-a*d*h-2*b*c*h+3*b*d*g)*n*(b*x+a)*(A+B*ln(e*(b*x
+a)^n/((d*x+c)^n)))^2/b^3/d^2-1/2*B*(-a*d+b*c)*h^2*n*(d*x+c)^2*(A+B*ln(e*(b
*x+a)^n/((d*x+c)^n)))^2/b/d^3+B*(-a*d+b*c)*(a^2*d^2*h^2-a*b*d*h*(-c*h+3*d*g
)+b^2*(c^2*h^2-3*c*d*g*h+3*d^2*g^2))*n*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(
b*x+a)^n/((d*x+c)^n)))^2/b^3/d^3-1/3*(-a*h+b*g)^3*(A+B*ln(e*(b*x+a)^n/((d*x
+c)^n)))^3/b^3/h+1/3*(h*x+g)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/h-B^2*(-
a*d+b*c)^3*h^2*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-b*(d*x+c)/d/(b*x+
a))/b^3/d^3-2*B^3*(-a*d+b*c)^2*h*(-a*d*h-2*b*c*h+3*b*d*g)*n^3*polylog(2,d*(
b*x+a)/b/(d*x+c))/b^3/d^3+2*B^2*(-a*d+b*c)*(a^2*d^2*h^2-a*b*d*h*(-c*h+3*d*g
)+b^2*(c^2*h^2-3*c*d*g*h+3*d^2*g^2))*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*
polylog(2,d*(b*x+a)/b/(d*x+c))/b^3/d^3+B^3*(-a*d+b*c)^3*h^2*n^3*polylog(2,b
*(d*x+c)/d/(b*x+a))/b^3/d^3-2*B^3*(-a*d+b*c)*(a^2*d^2*h^2-a*b*d*h*(-c*h+3*d
*g)+b^2*(c^2*h^2-3*c*d*g*h+3*d^2*g^2))*n^3*polylog(3,d*(b*x+a)/b/(d*x+c))/b
^3/d^3
```

Rubi [A] time = 3.48, antiderivative size = 1640, normalized size of antiderivative = 1.87, number of steps used = 53, number of rules used = 13, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.394, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] -((A^2*B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(b^2*d^2)) + (A*B^2*(
b*c - a*d)^2*h^2*n^2*x)/(b^2*d^2) - (A^2*B*(b*c - a*d)*h^2*n*x^2)/(2*b*d) +
 (A^3*(g + h*x)^3)/(3*h) - (A^2*B*(b*g - a*h)^3*n*Log[a + b*x])/(b^3*h) + (
a^2*A*B^2*(b*c - a*d)*h^2*n^2*Log[a + b*x])/(b^3*d) + (A^2*B*(d*g - c*h)^3*
n*Log[c + d*x])/(d^3*h) - (A*B^2*c^2*(b*c - a*d)*h^2*n^2*Log[c + d*x])/(b*d
^3) + (2*A*B^2*(b*c - a*d)^2*h*(3*b*d*g - b*c*h - a*d*h)*n^2*Log[c + d*x])/
(b^3*d^3) - (B^3*(b*c - a*d)^3*h^2*n^3*Log[c + d*x])/(b^3*d^3) - (A*B^2*(b*
c - a*d)*h^2*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) - (2*A*B^2*(b*c
 - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x
)^n])/(b^3*d^2) + (B^3*(b*c - a*d)^2*h^2*n^2*(a + b*x)*Log[(e*(a + b*x)^n)/
(c + d*x)^n])/(b^3*d^2) + (A^2*B*(g + h*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/h + (2*A*B^2*(b*g - a*h)^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(
a + b*x)^n)/(c + d*x)^n])/(b^3*h) - (a^2*B^3*(b*c - a*d)*h^2*n^2*Log[-((b*c
 - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^3*d) - (2*A*B^
2*(d*g - c*h)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d
*x)^n])/(d^3*h) + (B^3*c^2*(b*c - a*d)*h^2*n^2*Log[(b*c - a*d)/(b*(c + d*x)
)]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^3) - (2*B^3*(b*c - a*d)^2*h*(3*b*
d*g - b*c*h - a*d*h)*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)
/(c + d*x)^n])/(b^3*d^3) - (B^3*(b*c - a*d)*h^2*n*x^2*Log[(e*(a + b*x)^n)/(
c + d*x)^n]^2)/(2*b*d) - (B^3*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*(a
+ b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b^3*d^2) + (A*B^2*(g + h*x)^3*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^2)/h + (B^3*(b*g - a*h)^3*n*Log[-((b*c - a*
d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b^3*h) - (B^3*(d*g
- c*h)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
```

```
2)/(d^3*h) + (B^3*(g + h*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(3*h) - (
2*A*B^2*(d*g - c*h)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*h)
+ (B^3*c^2*(b*c - a*d)*h^2*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*
d^3) - (2*B^3*(b*c - a*d)^2*h*(3*b*d*g - b*c*h - a*d*h)*n^3*PolyLog[2, (d*(
a + b*x))/(b*(c + d*x))])/(b^3*d^3) - (2*A*B^2*(b*g - a*h)^3*n^2*PolyLog[2,
 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*h) + (a^2*B^3*(b*c - a*d)*h^2*n^3*Pol
yLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*d) - (2*B^3*(b*g - a*h)^3*n^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])
/(b^3*h) - (2*B^3*(d*g - c*h)^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLo
g[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^3*h) - (2*B^3*(b*g - a*h)^3*n^3*Pol
yLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*h) + (2*B^3*(d*g - c*h)^3*n^3*
PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^3*h)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
```

```
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \,dx = \int \left(A^3(g+hx)^2+3A^2B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right.\right.$$

$$= \frac{A^3(g+hx)^3}{3h} + \left(3A^2B\right)\int (g+hx)^2\log\left(e(a+bx)^n(c+dx)\right.$$

$$= \frac{A^3(g+hx)^3}{3h} + \frac{A^2B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} +$$

$$= \frac{A^3(g+hx)^3}{3h} + \frac{A^2B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} +$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} - \frac{A^2B(bc-ad)h^2nx}{2bd}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} - \frac{A^2B(bc-ad)h^2nx}{2bd}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} - \frac{A^2B(bc-ad)h^2nx}{2bd}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} + \frac{AB^2(bc-ad)^2h^2n}{b^2d^2}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} + \frac{AB^2(bc-ad)^2h^2n}{b^2d^2}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} + \frac{AB^2(bc-ad)^2h^2n}{b^2d^2}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} + \frac{AB^2(bc-ad)^2h^2n}{b^2d^2}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} + \frac{AB^2(bc-ad)^2h^2n}{b^2d^2}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2} + \frac{AB^2(bc-ad)^2h^2n}{b^2d^2}$$

Mathematica [F] time = 6.02, size = 0, normalized size = 0.00

$$\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
[Out] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3, x]
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(A^3h^2x^2+2\,A^3ghx+A^3g^2+\left(B^3h^2x^2+2\,B^3ghx+B^3g^2\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^3+3\left(AB^2h^2x^2+2\,AB^2ghx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fric
as")
```

```
[Out] integral(A^3*h^2*x^2 + 2*A^3*g*h*x + A^3*g^2 + (B^3*h^2*x^2 + 2*B^3*g*h*x +
 B^3*g^2)*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*(A*B^2*h^2*x^2 + 2*A*B^2*g*h
*x + A*B^2*g^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*h^2*x^2 + 2*A^2
*B*g*h*x + A^2*B*g^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac
")
```

```
[Out] Timed out
```

maple [F] time = 8.29, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)^{2} \left(B \ln \left(e \left(bx+a\right)^{n} \left(dx+c\right)^{-n}\right)+A\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxi
ma")
```

```
[Out] A^2*B*h^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^3*h^2*x^3 + 3*A^2*B*g*
h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^3*g*h*x^2 + 3*A^2*B*g^2*x*log((b*x
 + a)^n*e/(d*x + c)^n) + A^3*g^2*x + 3*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A^2*B*g^2/e - 3*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/
d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*g*h/e + 1/2*(2*a^3*e*n*log(b*x + a
)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(
b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A^2*B*h^2/e - 1/6*(2*(B^3*b^3*d^3*
h^2*x^3 + 3*B^3*b^3*d^3*g*h*x^2 + 3*B^3*b^3*d^3*g^2*x)*log((d*x + c)^n)^3 +
 3*(2*(3*c*d^2*g^2*n - 3*c^2*d*g*h*n + c^3*h^2*n)*B^3*b^3*log(d*x + c) - 2*
(3*a*b^2*d^3*g^2*n - 3*a^2*b*d^3*g*h*n + a^3*d^3*h^2*n)*B^3*log(b*x + a) -
2*(B^3*b^3*d^3*h^2*log(e) + A*B^2*b^3*d^3*h^2)*x^3 - (6*A*B^2*b^3*d^3*g*h +
 (a*b^2*d^3*h^2*n - (c*d^2*h^2*n - 6*d^3*g*h*log(e))*b^3)*B^3)*x^2 - 2*(3*A
*B^2*b^3*d^3*g^2 + (3*a*b^2*d^3*g*h*n - a^2*b*d^3*h^2*n - (3*c*d^2*g*h*n -
c^2*d*h^2*n - 3*d^3*g^2*log(e))*b^3)*B^3)*x - 2*(B^3*b^3*d^3*h^2*x^3 + 3*B^
3*b^3*d^3*g*h*x^2 + 3*B^3*b^3*d^3*g^2*x)*log((b*x + a)^n))*log((d*x + c)^n)
^2)/(b^3*d^3) - integrate(-(B^3*b^3*c*d^2*g^2*log(e)^3 + 3*A*B^2*b^3*c*d^2*
g^2*log(e)^2 + (B^3*b^3*d^3*h^2*log(e)^3 + 3*A*B^2*b^3*d^3*h^2*log(e)^2)*x^
3 + (B^3*b^3*d^3*h^2*x^3 + B^3*b^3*c*d^2*g^2 + (2*d^3*g*h + c*d^2*h^2)*B^3*
b^3*x^2 + (d^3*g^2 + 2*c*d^2*g*h)*B^3*b^3*x)*log((b*x + a)^n)^3 + (3*(2*d^3
*g*h*log(e)^2 + c*d^2*h^2*log(e)^2)*A*B^2*b^3 + (2*d^3*g*h*log(e)^3 + c*d^2
*h^2*log(e)^3)*B^3*b^3)*x^2 + 3*(B^3*b^3*c*d^2*g^2*log(e) + A*B^2*b^3*c*d^2
*g^2 + (B^3*b^3*d^3*h^2*log(e) + A*B^2*b^3*d^3*h^2)*x^3 + ((2*d^3*g*h + c*d
```

```
^2*h^2)*A*B^2*b^3 + (2*d^3*g*h*log(e) + c*d^2*h^2*log(e))*B^3*b^3)*x^2 + ((
d^3*g^2 + 2*c*d^2*g*h)*A*B^2*b^3 + (d^3*g^2*log(e) + 2*c*d^2*g*h*log(e))*B^
3*b^3)*x)*log((b*x + a)^n)^2 + (3*(d^3*g^2*log(e)^2 + 2*c*d^2*g*h*log(e)^2)
*A*B^2*b^3 + (d^3*g^2*log(e)^3 + 2*c*d^2*g*h*log(e)^3)*B^3*b^3)*x + 3*(B^3*
b^3*c*d^2*g^2*log(e)^2 + 2*A*B^2*b^3*c*d^2*g^2*log(e) + (B^3*b^3*d^3*h^2*lo
g(e)^2 + 2*A*B^2*b^3*d^3*h^2*log(e))*x^3 + (2*(2*d^3*g*h*log(e) + c*d^2*h^2
*log(e))*A*B^2*b^3 + (2*d^3*g*h*log(e)^2 + c*d^2*h^2*log(e)^2)*B^3*b^3)*x^2
 + (2*(d^3*g^2*log(e) + 2*c*d^2*g*h*log(e))*A*B^2*b^3 + (d^3*g^2*log(e)^2 +
 2*c*d^2*g*h*log(e)^2)*B^3*b^3)*x)*log((b*x + a)^n) - (3*B^3*b^3*c*d^2*g^2*
log(e)^2 + 6*A*B^2*b^3*c*d^2*g^2*log(e) - 2*(3*c*d^2*g^2*n^2 - 3*c^2*d*g*h*
n^2 + c^3*h^2*n^2)*B^3*b^3*log(d*x + c) + 2*(3*a*b^2*d^3*g^2*n^2 - 3*a^2*b*
d^3*g*h*n^2 + a^3*d^3*h^2*n^2)*B^3*log(b*x + a) + (2*(h^2*n + 3*h^2*log(e))
*A*B^2*b^3*d^3 + (2*h^2*n*log(e) + 3*h^2*log(e)^2)*B^3*b^3*d^3)*x^3 + (6*(c
*d^2*h^2*log(e) + (g*h*n + 2*g*h*log(e))*d^3)*A*B^2*b^3 + (a*b^2*d^3*h^2*n^
2 - ((h^2*n^2 - 3*h^2*log(e)^2)*c*d^2 - 6*(g*h*n*log(e) + g*h*log(e)^2)*d^3
)*b^3)*B^3)*x^2 + 3*(B^3*b^3*d^3*h^2*x^3 + B^3*b^3*c*d^2*g^2 + (2*d^3*g*h +
 c*d^2*h^2)*B^3*b^3*x^2 + (d^3*g^2 + 2*c*d^2*g*h)*B^3*b^3*x)*log((b*x + a)^
n)^2 + (6*(2*c*d^2*g*h*log(e) + (g^2*n + g^2*log(e))*d^3)*A*B^2*b^3 + (6*a*
b^2*d^3*g*h*n^2 - 2*a^2*b*d^3*h^2*n^2 + (2*c^2*d*h^2*n^2 - 6*(g*h*n^2 - g*h
*log(e)^2)*c*d^2 + 3*(2*g^2*n*log(e) + g^2*log(e)^2)*d^3)*b^3)*B^3)*x + 2*(
3*B^3*b^3*c*d^2*g^2*log(e) + 3*A*B^2*b^3*c*d^2*g^2 + (3*A*B^2*b^3*d^3*h^2 +
 (h^2*n + 3*h^2*log(e))*B^3*b^3*d^3)*x^3 + 3*((2*d^3*g*h + c*d^2*h^2)*A*B^2
*b^3 + (c*d^2*h^2*log(e) + (g*h*n + 2*g*h*log(e))*d^3)*B^3*b^3)*x^2 + 3*((d
^3*g^2 + 2*c*d^2*g*h)*A*B^2*b^3 + (2*c*d^2*g*h*log(e) + (g^2*n + g^2*log(e)
)*d^3)*B^3*b^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^3*x + b^3*c*d
^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(g+h\,x\right)^2\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3,x)
```

```
[Out] int((g + h*x)^2*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.310 $\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$

Optimal. Leaf size=466

$$\frac{3B^2n^2(bc-ad)(-adh-bch+2bdg)\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{b^2d^2}-3B^2hn^2(bc-ad)^2\log\Bigg(\frac{bc}{b(c}$$

```
[Out] -3*B^2*(-a*d+b*c)^2*h*n^2*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*
x+c)^n)))/b^2/d^2-3/2*B*(-a*d+b*c)*h*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)
^n)))^2/b^2/d+3/2*B*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)*n*ln((-a*d+b*c)/b/(d*
x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/b^2/d^2-1/2*(-a*h+b*g)^2*(A+B*ln(
e*(b*x+a)^n/((d*x+c)^n)))^3/b^2/h+1/2*(h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c
)^n)))^3/h-3*B^3*(-a*d+b*c)^2*h*n^3*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^2+
3*B^2*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g)*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)
))*polylog(2,d*(b*x+a)/b/(d*x+c))/b^2/d^2-3*B^3*(-a*d+b*c)*(-a*d*h-b*c*h+2*
b*d*g)*n^3*polylog(3,d*(b*x+a)/b/(d*x+c))/b^2/d^2
```

Rubi **[B]** time = 2.11, antiderivative size = 1030, normalized size of antiderivative = 2.21, number of steps used = 35, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{(g+hx)^2A^3}{2h}-\frac{3B(bc-ad)hnxA^2}{2bd}-\frac{3B(bg-ah)^2n\log(a+bx)A^2}{2b^2h}+\frac{3B(dg-ch)^2n\log(c+dx)A^2}{2d^2h}+\frac{3B(g+hx)^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (-3*A^2*B*(b*c - a*d)*h*n*x)/(2*b*d) + (A^3*(g + h*x)^2)/(2*h) - (3*A^2*B*(
b*g - a*h)^2*n*Log[a + b*x])/(2*b^2*h) + (3*A^2*B*(d*g - c*h)^2*n*Log[c + d
*x])/(2*d^2*h) + (3*A*B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/(b^2*d^2) - (3*
A*B^2*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*d) +
 (3*A^2*B*(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h) + (3*A*B^2*(b
*g - a*h)^2*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*
x)^n])/(b^2*h) - (3*A*B^2*(d*g - c*h)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n])/(d^2*h) - (3*B^3*(b*c - a*d)^2*h*n^2*Log[(b
*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*d^2) - (3*B
^3*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b^2*d)
+ (3*A*B^2*(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h) + (3*B^3*(
b*g - a*h)^2*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d
*x)^n]^2)/(2*b^2*h) - (3*B^3*(d*g - c*h)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*d^2*h) + (B^3*(g + h*x)^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^3)/(2*h) - (3*A*B^2*(d*g - c*h)^2*n^2*PolyLog[2, (d
*(a + b*x))/(b*(c + d*x))])/(d^2*h) - (3*B^3*(b*c - a*d)^2*h*n^3*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(b^2*d^2) - (3*A*B^2*(b*g - a*h)^2*n^2*PolyL
og[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*h) - (3*B^3*(b*g - a*h)^2*n^2*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(
b^2*h) - (3*B^3*(d*g - c*h)^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[
2, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^2*h) - (3*B^3*(b*g - a*h)^2*n^3*PolyL
og[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*h) + (3*B^3*(d*g - c*h)^2*n^3*Po
lyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^2*h)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 dx = \int \left(A^3(g+hx)+3A^2B(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+\right.$$

$$= \frac{A^3(g+hx)^2}{2h} + \left(3A^2B\right)\int (g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.$$

$$= \frac{A^3(g+hx)^2}{2h} + \frac{3A^2B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h} +$$

$$= \frac{A^3(g+hx)^2}{2h} + \frac{3A^2B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h} +$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log}{2b^2h}$$

Mathematica [F] time = 3.29, size = 0, normalized size = 0.00

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3, x]
```

fricas [F] time = 0.94, size = 0, normalized size = 0.00

$$\text{integral}\left(A^3hx + A^3g + \left(B^3hx + B^3g\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\left(AB^2hx + AB^2g\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\left(A^2Bhx + \right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fricas
")
```

```
[Out] integral(A^3*h*x + A^3*g + (B^3*h*x + B^3*g)*log((b*x + a)^n*e/(d*x + c)^n)
^3 + 3*(A*B^2*h*x + A*B^2*g)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*h*
x + A^2*B*g)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 8.96, size = 0, normalized size = 0.00

$$\int \left(hx+g\right)\left(B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+A\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxima
")
```

```
[Out] 3/2*A^2*B*h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^3*h*x^2 + 3*A^2*B*g*
x*log((b*x + a)^n*e/(d*x + c)^n) + A^3*g*x + 3*(a*e*n*log(b*x + a)/b - c*e*
n*log(d*x + c)/d)*A^2*B*g/e - 3/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d
*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*h/e - 1/2*((B^3*b^2*d^2*h*
x^2 + 2*B^3*b^2*d^2*g*x)*log((d*x + c)^n)^3 + 3*((2*c*d*g*n - c^2*h*n)*B^3*
b^2*log(d*x + c) - (2*a*b*d^2*g*n - a^2*d^2*h*n)*B^3*log(b*x + a) - (B^3*b^
2*d^2*h*log(e) + A*B^2*b^2*d^2*h)*x^2 - (2*A*B^2*b^2*d^2*g + (a*b*d^2*h*n -
 (c*d*h*n - 2*d^2*g*log(e))*b^2)*B^3)*x - (B^3*b^2*d^2*h*x^2 + 2*B^3*b^2*d^
2*g*x)*log((b*x + a)^n))*log((d*x + c)^n)^2)/(b^2*d^2) - integrate(-(B^3*b^
2*c*d*g*log(e)^3 + 3*A*B^2*b^2*c*d*g*log(e)^2 + (B^3*b^2*d^2*h*x^2 + B^3*b^
2*c*d*g + (d^2*g + c*d*h)*B^3*b^2*x)*log((b*x + a)^n)^3 + (B^3*b^2*d^2*h*lo
g(e)^3 + 3*A*B^2*b^2*d^2*h*log(e)^2)*x^2 + 3*(B^3*b^2*c*d*g*log(e) + A*B^2*
b^2*c*d*g + (B^3*b^2*d^2*h*log(e) + A*B^2*b^2*d^2*h)*x^2 + ((d^2*g + c*d*h)
*A*B^2*b^2 + (d^2*g*log(e) + c*d*h*log(e))*B^3*b^2)*x)*log((b*x + a)^n)^2 +
 (3*(d^2*g*log(e)^2 + c*d*h*log(e)^2)*A*B^2*b^2 + (d^2*g*log(e)^3 + c*d*h*l
og(e)^3)*B^3*b^2)*x + 3*(B^3*b^2*c*d*g*log(e)^2 + 2*A*B^2*b^2*c*d*g*log(e)
+ (B^3*b^2*d^2*h*log(e)^2 + 2*A*B^2*b^2*d^2*h*log(e))*x^2 + (2*(d^2*g*log(e
) + c*d*h*log(e))*A*B^2*b^2 + (d^2*g*log(e)^2 + c*d*h*log(e)^2)*B^3*b^2)*x)
*log((b*x + a)^n) - 3*(B^3*b^2*c*d*g*log(e)^2 + 2*A*B^2*b^2*c*d*g*log(e) -
(2*c*d*g*n^2 - c^2*h*n^2)*B^3*b^2*log(d*x + c) + (2*a*b*d^2*g*n^2 - a^2*d^2
*h*n^2)*B^3*log(b*x + a) + ((h*n + 2*h*log(e))*A*B^2*b^2*d^2 + (h*n*log(e)
+ h*log(e)^2)*B^3*b^2*d^2)*x^2 + (B^3*b^2*d^2*h*x^2 + B^3*b^2*c*d*g + (d^2*
g + c*d*h)*B^3*b^2*x)*log((b*x + a)^n)^2 + (2*(c*d*h*log(e) + (g*n + g*log(
e))*d^2)*A*B^2*b^2 + (a*b*d^2*h*n^2 - ((h*n^2 - h*log(e)^2)*c*d - (2*g*n*lo
g(e) + g*log(e)^2)*d^2)*b^2)*B^3)*x + (2*B^3*b^2*c*d*g*log(e) + 2*A*B^2*b^2
*c*d*g + ((h*n + 2*h*log(e))*B^3*b^2*d^2 + 2*A*B^2*b^2*d^2*h)*x^2 + 2*((d^2
*g + c*d*h)*A*B^2*b^2 + (c*d*h*log(e) + (g*n + g*log(e))*d^2)*B^3*b^2)*x)*l
og((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^2*x + b^2*c*d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(g+h\,x\right)\,{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g + h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3,x)
```

```
[Out] int((g + h*x)*(A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3, x)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.311 $\int \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$

Optimal. Leaf size=203

$$\frac{6B^2n^2(bc-ad)\mathrm{Li}_2\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bd}+\frac{3Bn(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\Big(B\log\big(e(a+bx)^n(}{bd}$$

```
[Out] 3*B*(-a*d+b*c)*n*ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))
^2/b/d+(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/b+6*B^2*(-a*d+b*c)*n^2*(
A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,d*(b*x+a)/b/(d*x+c))/b/d-6*B^3*(
-a*d+b*c)*n^3*polylog(3,d*(b*x+a)/b/(d*x+c))/b/d
```

Rubi [B] time = 0.59, antiderivative size = 408, normalized size of antiderivative = 2.01, number of steps used = 14, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {6742, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{6AB^2n^2(bc-ad)\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{6B^3n^2(bc-ad)\mathrm{PolyLog}\left(2,1-\frac{bc-ad}{b(c+dx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{bd}-6B$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] A^3*x - (3*A^2*B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (3*A^2*B*(a + b*x)*Log
[(e*(a + b*x)^n)/(c + d*x)^n])/b + (6*A*B^2*(b*c - a*d)*n*Log[(b*c - a*d)/(
b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (3*A*B^2*(a + b*x)*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/b + (3*B^3*(b*c - a*d)*n*Log[(b*c - a*d
)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b*d) + (B^3*(a + b*x)
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/b + (6*A*B^2*(b*c - a*d)*n^2*PolyLog[2
, (d*(a + b*x))/(b*(c + d*x))])/(b*d) + (6*B^3*(b*c - a*d)*n^2*Log[(e*(a +
b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d) - (6*
B^3*(b*c - a*d)*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
```

```
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \left(A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx = \int \Big(A^3 + 3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right) + 3AB^2\log^2\big(e(a+bx)$$

$$= A^3x + \left(3A^2B\right)\int \log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx + \left(3AB^2\right)\int \log^2$$

$$= A^3x + \frac{3A^2B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + 3AB^2(a+bx)\,\mathrm{l}$$

$$= A^3x - \frac{3A^2B(bc-ad)n\log(c+dx)}{bd} + \frac{3A^2B(a+bx)\log\big(e(a+bx}{b}$$

$$= A^3x - \frac{3A^2B(bc-ad)n\log(c+dx)}{bd} + \frac{3A^2B(a+bx)\log\big(e(a+bx}{b}$$

$$= A^3x - \frac{3A^2B(bc-ad)n\log(c+dx)}{bd} + \frac{3A^2B(a+bx)\log\big(e(a+bx}{b}$$

$$= A^3x - \frac{3A^2B(bc-ad)n\log(c+dx)}{bd} + \frac{3A^2B(a+bx)\log\big(e(a+bx}{b}$$

$$= A^3x - \frac{3A^2B(bc-ad)n\log(c+dx)}{bd} + \frac{3A^2B(a+bx)\log\big(e(a+bx}{b}$$

Mathematica [A] time = 0.31, size = 378, normalized size = 1.86

$$3A^2Bd(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right) - 3A^2Bn(bc-ad)\log(c+dx) + 3AB^2n(bc-ad)\Big(2n\mathrm{Li}_2\left(\tfrac{b(c+dx)}{bc-ad}\right) - 1$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (A^3*b*d*x - 3*A^2*B*(b*c - a*d)*n*Log[c + d*x] + 3*A^2*B*d*(a + b*x)*Log[(
e*(a + b*x)^n)/(c + d*x)^n] + 3*A*B^2*d*(a + b*x)*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2 + B^3*d*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3 + 3*A*B^2*(b
*c - a*d)*n*(-(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*n*Log[(d*(a + b*x))/(-(b*c
) + a*d)] - 2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + n*Log[(b*c - a*d)/(b*c + b
*d*x)])) + 2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*B^3*(b*c - a*d)*n
*(Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*n*L
og[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2
*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]))/(b*d)
```

fricas [F] time = 2.94, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fricas")
```

```
[Out] integral(B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/(
d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

maple [F] time = 4.52, size = 0, normalized size = 0.00

$$\int \left(B \ln\left(e\left(bx+a\right)^n \left(dx+c\right)^{-n}\right) + A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$3\,A^2Bx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3x + \frac{3\left(\frac{aen\log(bx+a)}{b} - \frac{cen\log(dx+c)}{d}\right)A^2B}{e} - \frac{B^3bdx\log\left(\left(dx+c\right)^n\right)^3 - 3\left(B^3adn\log\left(bx+a\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxima")
```

```
[Out] 3*A^2*B*x*log((b*x + a)^n*e/(d*x + c)^n) + A^3*x + 3*(a*e*n*log(b*x + a)/b
- c*e*n*log(d*x + c)/d)*A^2*B/e - (B^3*b*d*x*log((d*x + c)^n)^3 - 3*(B^3*a*
d*n*log(b*x + a) - B^3*b*c*n*log(d*x + c) + B^3*b*d*x*log((b*x + a)^n) + (B
^3*b*d*log(e) + A*B^2*b*d)*x)*log((d*x + c)^n)^2)/(b*d) - integrate(-(B^3*b
*c*log(e)^3 + 3*A*B^2*b*c*log(e)^2 + (B^3*b*d*x + B^3*b*c)*log((b*x + a)^n)
^3 + 3*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*log(e) + A*B^2*b*d)*x)*log((b
*x + a)^n)^2 + (B^3*b*d*log(e)^3 + 3*A*B^2*b*d*log(e)^2)*x + 3*(B^3*b*c*log
(e)^2 + 2*A*B^2*b*c*log(e) + (B^3*b*d*log(e)^2 + 2*A*B^2*b*d*log(e))*x)*log
((b*x + a)^n) - 3*(2*B^3*a*d*n^2*log(b*x + a) - 2*B^3*b*c*n^2*log(d*x + c)
+ B^3*b*c*log(e)^2 + 2*A*B^2*b*c*log(e) + (B^3*b*d*x + B^3*b*c)*log((b*x +
a)^n)^2 + ((2*n*log(e) + log(e)^2)*B^3*b*d + 2*A*B^2*b*d*(n + log(e)))*x +
2*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*(n + log(e)) + A*B^2*b*d)*x)*log((
b*x + a)^n))*log((d*x + c)^n))/(b*d*x + b*c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3, x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.312 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{g+hx}\,dx$

Optimal. Leaf size=425

$$-\frac{6B^2n^2\text{Li}_3\left(\frac{(dg-ch)(a+bx)}{(bg-ah)(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h}+\frac{6B^2n^2\text{Li}_3\left(\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right.}{h}$$

```
[Out] -ln((-a*d+b*c)/b/(d*x+c))*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/h+(A+B*ln(e*(
b*x+a)^n/((d*x+c)^n)))^3*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/h-3*B*
n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*polylog(2,d*(b*x+a)/b/(d*x+c))/h+3*B*
n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*polylog(2,(-c*h+d*g)*(b*x+a)/(-a*h+b*
g)/(d*x+c))/h+6*B^2*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(3,d*(b*x+
a)/b/(d*x+c))/h-6*B^2*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(3,(-c*h
+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/h-6*B^3*n^3*polylog(4,d*(b*x+a)/b/(d*x+c)
)/h+6*B^3*n^3*polylog(4,(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/h
```

Rubi [B] time = 1.64, antiderivative size = 921, normalized size of antiderivative = 2.17, number of steps used = 25, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2494, 2394, 2393, 2391, 2489, 2488, 2506, 6610, 2503, 2508}

$$\frac{\log(g+hx)A^3}{h}-\frac{3Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)A^2}{h}+\frac{3Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log(g+hx)A^2}{h}+\frac{3B\log\left(e(a+bx)^n(c+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x),x]
```

```
[Out] (-3*A*B^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2
)/h - (B^3*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
3)/h + (A^3*Log[g + h*x])/h - (3*A^2*B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*
Log[g + h*x])/h + (3*A^2*B*n*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x]
)/h + (3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/h + (3*A*B^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)*(g + h*x))/((b*g - a*h)
*(c + d*x))])/h + (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[((b*c - a*d)*
(g + h*x))/((b*g - a*h)*(c + d*x))])/h - (3*A^2*B*n*PolyLog[2, (b*(g + h*x)
)/(b*g - a*h)])/h + (3*A^2*B*n*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/h - (
6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c
 + d*x))])/h - (3*B^3*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[2, 1 - (
b*c - a*d)/(b*(c + d*x))])/h + (6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*
PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h + (3*B^3
*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x)
)/((b*g - a*h)*(c + d*x))])/h + (6*A*B^2*n^2*PolyLog[3, 1 - (b*c - a*d)/(b*
(c + d*x))])/h + (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, 1 -
 (b*c - a*d)/(b*(c + d*x))])/h - (6*A*B^2*n^2*PolyLog[3, 1 - ((b*c - a*d)*(
g + h*x))/((b*g - a*h)*(c + d*x))])/h - (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*PolyLog[3, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h
 - (6*B^3*n^3*PolyLog[4, 1 - (b*c - a*d)/(b*(c + d*x))])/h + (6*B^3*n^3*Pol
yLog[4, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

```
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2489

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r]^s/(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[Log[e
*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a
, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0
] && NeQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 1]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{g+hx}\,dx = \int \left(\frac{A^3}{g+hx}+\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}+\frac{3AB^2\log^2\left(e(a\right.}{g}\right.$$

$$= \frac{A^3\log(g+hx)}{h}+\left(3A^2B\right)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\,dx+\left(3A\right.$$

$$= \frac{A^3\log(g+hx)}{h}+\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log(g+hx)}{h}+$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}-\frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right.}{}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}-\frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right.}{}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}-\frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right.}{}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}-\frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right.}{}$$

Mathematica [F] time = 1.53, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{g+hx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x), x]
```

fricas [F] time = 1.13, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{hx+g}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x, algorithm="fricas
")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(h*x + g), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(h*x + g), x)
```

maple [F] time = 3.76, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\,(bx+a)^n\,(dx+c)^{-n}\right) + A\right)^3}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{A^3\log\left(hx+g\right)}{h} - \int -\frac{B^3\log\left((bx+a)^n\right)^3 - B^3\log\left((dx+c)^n\right)^3 + B^3\log(e)^3 + 3\,AB^2\log(e)^2 + 3\,A^2B\log(e) + 3\,\Big(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x, algorithm="maxima
")
```

```
[Out] A^3*log(h*x + g)/h - integrate(-(B^3*log((b*x + a)^n)^3 - B^3*log((d*x + c)
^n)^3 + B^3*log(e)^3 + 3*A*B^2*log(e)^2 + 3*A^2*B*log(e) + 3*(B^3*log(e) +
A*B^2)*log((b*x + a)^n)^2 + 3*(B^3*log((b*x + a)^n) + B^3*log(e) + A*B^2)*l
og((d*x + c)^n)^2 + 3*(B^3*log(e)^2 + 2*A*B^2*log(e) + A^2*B)*log((b*x + a)
^n) - 3*(B^3*log((b*x + a)^n)^2 + B^3*log(e)^2 + 2*A*B^2*log(e) + A^2*B + 2
*(B^3*log(e) + A*B^2)*log((b*x + a)^n))*log((d*x + c)^n))/(h*x + g), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^3}{g + h\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(g + h*x),x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(g + h*x), x)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: HeuristicGCDFailed

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(h*x+g),x)
```

```
[Out] Exception raised: HeuristicGCDFailed
```

3.313 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{(g+hx)^2}\,dx$

Optimal. Leaf size=302

$$\frac{6B^2n^2(bc-ad)\text{Li}_2\left(\frac{(dg-ch)(a+bx)}{(bg-ah)(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(bg-ah)(dg-ch)}+\frac{3Bn(bc-ad)\log\left(1-\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)\left(B\log(e\right.}{(bg-ah)(dg-ch}$$

```
[Out] (b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(-a*h+b*g)/(h*x+g)+3*B*(-a*d+b*
c)*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*g)
/(d*x+c))/(-a*h+b*g)/(-c*h+d*g)+6*B^2*(-a*d+b*c)*n^2*(A+B*ln(e*(b*x+a)^n/((
d*x+c)^n)))*polylog(2,(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/(-a*h+b*g)/(-c
*h+d*g)-6*B^3*(-a*d+b*c)*n^3*polylog(3,(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c
))/(-a*h+b*g)/(-c*h+d*g)
```

Rubi **[B]** time = 0.81, antiderivative size = 650, normalized size of antiderivative = 2.15, number of steps used = 14, number of rules used = 9, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {6742, 2490, 36, 31, 2503, 2502, 2315, 2506, 6610}

$$\frac{6AB^2n^2(bc-ad)\text{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}+\frac{6B^3n^2(bc-ad)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\text{PolyLog}\left(2,1-\frac{(g+hx)(}{(c+dx)(}\right.}{(bg-ah)(dg-ch)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^2,x]
```

```
[Out] -(A^3/(h*(g + h*x))) - (3*A^2*B*(b*c - a*d)*n*Log[c + d*x])/((b*g - a*h)*(d
*g - c*h)) + (3*A^2*B*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a
*h)*(g + h*x)) + (3*A*B^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b
*g - a*h)*(g + h*x)) + (B^3*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(
(b*g - a*h)*(g + h*x)) + (3*A^2*B*(b*c - a*d)*n*Log[g + h*x])/((b*g - a*h)*
(d*g - c*h)) + (6*A*B^2*(b*c - a*d)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[
((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h))
 + (3*B^3*(b*c - a*d)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)
*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h)) + (6*A*B^2*
(b*c - a*d)*n^2*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*
x))])/((b*g - a*h)*(d*g - c*h)) + (6*B^3*(b*c - a*d)*n^2*Log[(e*(a + b*x)^n
)/(c + d*x)^n]*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x
))])/((b*g - a*h)*(d*g - c*h)) - (6*B^3*(b*c - a*d)*n^3*PolyLog[3, 1 - ((b*
c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(g+hx)^2}\,dx &= \int\left(\frac{A^3}{(g+hx)^2}+\frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}+\frac{3AB^2\log^2\left(e(a+\right.}{(g+}\right.\\ &= -\frac{A^3}{h(g+hx)}+\left(3A^2B\right)\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\,dx+\left(3AB^2\right)\int\\ &= -\frac{A^3}{h(g+hx)}+\frac{3A^2B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}+\frac{3AB^2(a+}{}\\ &= -\frac{A^3}{h(g+hx)}+\frac{3A^2B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}+\frac{3AB^2(a+}{}\\ &= -\frac{A^3}{h(g+hx)}-\frac{3A^2B(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{3A^2B(a+bx)\log\left(e(a\right.}{(bg-ah)(g}\\ &= -\frac{A^3}{h(g+hx)}-\frac{3A^2B(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{3A^2B(a+bx)\log\left(e(a\right.}{(bg-ah)(g}\end{aligned}$$

Mathematica [F] time = 3.13, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^2,x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^2, x]
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^3+3\,AB^2\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^2+3\,A^2B\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+A^3}{h^2x^2+2\,ghx+g^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x, algorithm="fric
as")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(h^2*x^2 + 2
*g*h*x + g^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(B\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+A\right)^3}{\left(hx+g\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(h*x + g)^2, x)
```

maple [**F**] time = 3.36, size = 0, normalized size = 0.00

$$\int \frac{\left(B\ln\left(e\left(bx+a\right)^{n}\left(dx+c\right)^{-n}\right)+A\right)^{3}}{\left(hx+g\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{B^{3}\log\left(\left(dx+c\right)^{n}\right)^{3}}{h^{2}x+gh}+\frac{3\left(\frac{ben\log(bx+a)}{bgh-ah^{2}}-\frac{den\log(dx+c)}{dgh-ch^{2}}-\frac{(bcen-aden)\log\left(hx+g\right)}{\left(dgh-ch^{2}\right)a-\left(dg^{2}-cgh\right)b}\right)A^{2}B}{e}-\frac{3\,A^{2}B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)}{h^{2}x+gh}-\frac{A^{3}}{h^{2}x+gh}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x, algorithm="maxi
ma")
```

```
[Out] B^3*log((d*x + c)^n)^3/(h^2*x + g*h) + 3*(b*e*n*log(b*x + a)/(b*g*h - a*h^2
) - d*e*n*log(d*x + c)/(d*g*h - c*h^2) - (b*c*e*n - a*d*e*n)*log(h*x + g)/(
(d*g*h - c*h^2)*a - (d*g^2 - c*g*h)*b))*A^2*B/e - 3*A^2*B*log((b*x + a)^n*e
/(d*x + c)^n)/(h^2*x + g*h) - A^3/(h^2*x + g*h) + integrate((B^3*c*h*log(e)
^3 + 3*A*B^2*c*h*log(e)^2 + (B^3*d*h*x + B^3*c*h)*log((b*x + a)^n)^3 + 3*(B
^3*c*h*log(e) + A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n
)^2 + 3*(A*B^2*c*h - (d*g*n - c*h*log(e))*B^3 - ((h*n - h*log(e))*B^3*d - A
*B^2*d*h)*x + (B^3*d*h*x + B^3*c*h)*log((b*x + a)^n))*log((d*x + c)^n)^2 +
(B^3*d*h*log(e)^3 + 3*A*B^2*d*h*log(e)^2)*x + 3*(B^3*c*h*log(e)^2 + 2*A*B^2
*c*h*log(e) + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x)*log((b*x + a)^n) -
 3*(B^3*c*h*log(e)^2 + 2*A*B^2*c*h*log(e) + (B^3*d*h*x + B^3*c*h)*log((b*x
+ a)^n)^2 + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x + 2*(B^3*c*h*log(e) +
 A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n))*log((d*x + c
)^n))/(d*h^3*x^3 + c*g^2*h + (2*d*g*h^2 + c*h^3)*x^2 + (d*g^2*h + 2*c*g*h^2
)*x), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(A+B\,\ln\left(\frac{e\,{\left(a+b\,x\right)}^n}{{\left(c+d\,x\right)}^n}\right)\right)}^3}{{\left(g+h\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(g + h*x)^2,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(g + h*x)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(h*x+g)**2,x)
```

```
[Out] Timed out
```

3.314 $\int \frac{\left(A+B\log(e(a+bx)^n(c+dx)^{-n})\right)^3}{(g+hx)^3}\,dx$

Optimal. Leaf size=629

$$\frac{b^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^3}{2h(bg-ah)^2}+\frac{3B^2n^2(bc-ad)(-adh-bch+2bdg)\mathrm{Li}_2\left(\frac{(dg-ch)(a+bx)}{(bg-ah)(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c\right.\right.}{(bg-ah)^2(dg-ch)^2}$$

```
[Out] 3/2*B*(-a*d+b*c)*h*n*(b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(-a*h+b*g)
^2/(-c*h+d*g)/(h*x+g)+1/2*b^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/h/(-a*h+b
*g)^2-1/2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/h/(h*x+g)^2+3*B^2*(-a*d+b*c)^
2*h*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*g
)/(d*x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2+3/2*B*(-a*d+b*c)*(-a*d*h-b*c*h+2*b*d*g
)*n*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2*ln(1-(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/
(d*x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2+3*B^3*(-a*d+b*c)^2*h*n^3*polylog(2,(-c*h
+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2+3*B^2*(-a*d+b*c
)*(-a*d*h-b*c*h+2*b*d*g)*n^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))*polylog(2,(-
c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2-3*B^3*(-a*d+
b*c)*(-a*d*h-b*c*h+2*b*d*g)*n^3*polylog(3,(-c*h+d*g)*(b*x+a)/(-a*h+b*g)/(d*
x+c))/(-a*h+b*g)^2/(-c*h+d*g)^2
```

Rubi [B] time = 3.75, antiderivative size = 2207, normalized size of antiderivative = 3.51, number of steps used = 49, number of rules used = 21, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636, Rules used = {6742, 2492, 72, 2514, 2488, 2411, 2343, 2333, 2315, 2490, 36, 31, 2494, 2394, 2393, 2391, 2506, 6610, 2503, 2502, 2489}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^3,x]
```

```
[Out] -A^3/(2*h*(g + h*x)^2) - (3*A^2*B*(b*c - a*d)*n)/(2*(b*g - a*h)*(d*g - c*h)
*(g + h*x)) + (3*A^2*b^2*B*n*Log[a + b*x])/(2*h*(b*g - a*h)^2) - (3*A^2*B*d
^2*n*Log[c + d*x])/(2*h*(d*g - c*h)^2) - (3*A*B^2*(b*c - a*d)^2*h*n^2*Log[c
 + d*x])/((b*g - a*h)^2*(d*g - c*h)^2) - (3*A^2*B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/(2*h*(g + h*x)^2) + (3*A*B^2*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])/((b*g - a*h)^2*(d*g - c*h)*(g + h*x)) - (3*A*b^2*B^2
*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(
b*g - a*h)^2) + (3*A*B^2*d^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b
*x)^n)/(c + d*x)^n])/(h*(d*g - c*h)^2) - (3*A*B^2*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2)/(2*h*(g + h*x)^2) + (3*B^3*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a +
 b*x)^n)/(c + d*x)^n]^2)/(2*(b*g - a*h)^2*(d*g - c*h)*(g + h*x)) - (3*b^2*B
^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/
(2*h*(b*g - a*h)^2) + (3*B^3*d^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/(2*h*(d*g - c*h)^2) - (3*B^3*(b*c - a*d)*(2*b*d*
g - b*c*h - a*d*h)*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2)/(2*(b*g - a*h)^2*(d*g - c*h)^2) - (B^3*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^3)/(2*h*(g + h*x)^2) + (3*A^2*B*(b*c - a*d)*(2*b*d*g - b*c*h - a*
d*h)*n*Log[g + h*x])/(2*(b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)
^2*h*n^2*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) - (3*A*B^2*(b*c - a*d)
*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g + h*
x])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h -
 a*d*h)*n^2*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/((b*g - a*h)^2*
(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^
3*(b*c - a*d)^2*h*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[((b*c - a*d)*(g
+ h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b
*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Lo
```

```
g[((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))]])/(2*(b*g - a*h)^2*(d*g -
 c*h)^2) + (3*A*B^2*d^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(h*(d*
g - c*h)^2) - (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog[2,
 (b*(g + h*x))/(b*g - a*h)])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c
- a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])
/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*b^2*B^2*n^2*PolyLog[2, 1 + (b*c - a*d
)/(d*(a + b*x))])/(h*(b*g - a*h)^2) + (3*b^2*B^3*n^2*Log[(e*(a + b*x)^n)/(c
 + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(h*(b*g - a*h)^2) + (
3*B^3*d^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(
b*(c + d*x))])/(h*(d*g - c*h)^2) - (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*
d*h)*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c
+ d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)^2*h*n^3*PolyLo
g[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)^2*(
d*g - c*h)^2) + (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*
(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*b^2*B^3*n^3*PolyLog[3, 1 +
(b*c - a*d)/(d*(a + b*x))])/(h*(b*g - a*h)^2) - (3*B^3*d^2*n^3*PolyLog[3, 1
 - (b*c - a*d)/(b*(c + d*x))])/(h*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)*(2*b*
d*g - b*c*h - a*d*h)*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/((b*g -
 a*h)^2*(d*g - c*h)^2) - (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^3*P
olyLog[3, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h
)^2*(d*g - c*h)^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
```

```
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2489

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r]^s/(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[Log[e
*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a
, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0
] && NeQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 1]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
```

```
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
```

]

Rubi steps

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(g+hx)^3}\,dx = \int \Bigg(\frac{A^3}{(g+hx)^3} + \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3} + \frac{3AB^2\log^2\left(e(a\right.}{(g+}$$

$$= -\frac{A^3}{2h(g+hx)^2} + \left(3A^2B\right)\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\,dx + \left(3AB^2\right)$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2} - \frac{3AB^2\log^2\left(e(a+\right.}{2h(g}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2} - \frac{3AB^2\log^2\left(e(a+\right.}{2h(g}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx}{2h(bg-ah)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx}{2h(bg-ah)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx}{2h(bg-ah)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx}{2h(bg-ah)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx}{2h(bg-ah)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx}{2h(bg-ah)^2}$$

Mathematica [F] time = 6.37, size = 0, normalized size = 0.00

$$\int \frac{\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^3,x]
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^3, x]
```

fricas [F] time = 1.00, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{h^3x^3 + 3\,gh^2x^2 + 3\,g^2hx + g^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x, algorithm="fric
as")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(h^3*x^3 + 3
*g*h^2*x^2 + 3*g^2*h*x + g^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{\left(hx+g\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(h*x + g)^3, x)
```

maple [F] time = 5.69, size = 0, normalized size = 0.00

$$\int\frac{\left(B\ln\left(e\,(bx+a)^n\,(dx+c)^{-n}\right)+A\right)^3}{\left(hx+g\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{B^3\log\left((dx+c)^n\right)^3}{2\left(h^3x^2+2\,gh^2x+g^2h\right)}+\frac{3\left(\frac{b^2en\log(bx+a)}{b^2g^2h-2\,abgh^2+a^2h^3}-\frac{d^2en\log(dx+c)}{d^2g^2h-2\,cdgh^2+c^2h^3}-\frac{\left(2\,abd^2egn-a^2d^2ehn-\left(2\,cdegn-c^2ehn\right)b^2\right)}{\left(d^2g^2h^2-2\,cdgh^3+c^2h^4\right)a^2-2\left(d^2g^3h-2\,cdg^2h^2+c^2gh^3\right)ab+}\right.}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/2*B^3*log((d*x + c)^n)^3/(h^3*x^2 + 2*g*h^2*x + g^2*h) + 3/2*(b^2*e*n*log
(b*x + a)/(b^2*g^2*h - 2*a*b*g*h^2 + a^2*h^3) - d^2*e*n*log(d*x + c)/(d^2*g
^2*h - 2*c*d*g*h^2 + c^2*h^3) - (2*a*b*d^2*e*g*n - a^2*d^2*e*h*n - (2*c*d*e
*g*n - c^2*e*h*n)*b^2)*log(h*x + g)/((d^2*g^2*h^2 - 2*c*d*g*h^3 + c^2*h^4)*
a^2 - 2*(d^2*g^3*h - 2*c*d*g^2*h^2 + c^2*g*h^3)*a*b + (d^2*g^4 - 2*c*d*g^3*
h + c^2*g^2*h^2)*b^2) + (b*c*e*n - a*d*e*n)/((d*g^2*h - c*g*h^2)*a - (d*g^3
 - c*g^2*h)*b + ((d*g*h^2 - c*h^3)*a - (d*g^2*h - c*g*h^2)*b)*x))*A^2*B/e -
 3/2*A^2*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^3*x^2 + 2*g*h^2*x + g^2*h) - 1
/2*A^3/(h^3*x^2 + 2*g*h^2*x + g^2*h) + integrate(1/2*(2*B^3*c*h*log(e)^3 +
6*A*B^2*c*h*log(e)^2 + 2*(B^3*d*h*x + B^3*c*h)*log((b*x + a)^n)^3 + 6*(B^3*
c*h*log(e) + A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n)^2
 + 3*(2*A*B^2*c*h - (d*g*n - 2*c*h*log(e))*B^3 - ((h*n - 2*h*log(e))*B^3*d
- 2*A*B^2*d*h)*x + 2*(B^3*d*h*x + B^3*c*h)*log((b*x + a)^n))*log((d*x + c)^
n)^2 + 2*(B^3*d*h*log(e)^3 + 3*A*B^2*d*h*log(e)^2)*x + 6*(B^3*c*h*log(e)^2
+ 2*A*B^2*c*h*log(e) + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x)*log((b*x
+ a)^n) - 6*(B^3*c*h*log(e)^2 + 2*A*B^2*c*h*log(e) + (B^3*d*h*x + B^3*c*h)*
log((b*x + a)^n)^2 + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x + 2*(B^3*c*h
*log(e) + A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n))*log
```

```
((d*x + c)^n))/(d*h^4*x^4 + c*g^3*h + (3*d*g*h^3 + c*h^4)*x^3 + 3*(d*g^2*h^
2 + c*g*h^3)*x^2 + (d*g^3*h + 3*c*g^2*h^2)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(A + B\,\ln\left(\frac{e\,(a+b\,x)^n}{(c+d\,x)^n}\right)\right)^3}{\left(g + h\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(g + h*x)^3,x)
```

```
[Out] int((A + B*log((e*(a + b*x)^n)/(c + d*x)^n))^3/(g + h*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)



(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]



(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
```

```
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
```

```
AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
   debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
   ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
```

```
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do
   not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
```

```
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
```

```
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```
def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn
    )))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
    ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or
    type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
    expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType
    ,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9
```

```
#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
```

```
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug=False
    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
   sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','
   hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
   sagemath

def is_atom(expn):

    debug=False
    if debug: print ("Enter is_atom")


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-
   sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
```

```
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens")
   :
            return expn in expn.parent().base_ring() or expn in expn.parent().
   gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
   Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
   args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer
   )
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],
   Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
   Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(
   expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
   [1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
   isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn
   .func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(
   expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #
   is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
   expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
```

```
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, "
    leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
    expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
    well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```