Computer algebra independent integration tests

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

Nasser M. Abbasi

May 17, 2020 Compiled on May 17, 2020 at 11:31pm

Contents

Chapter 1

Introduction

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

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

1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 91.72 (288)	% 8.28 (26)
Mathematica	% 94.9 (298)	% 5.1 (16)
Maple	% 59.55 (187)	% 40.45 (127)
Maxima	% 75.8 (238)	% 24.2 (76)
Fricas	% 65.61 (206)	% 34.39 (108)
Sympy	% 17.52 (55)	% 82.48 (259)
Giac	% 50. (157)	% 50. (157)

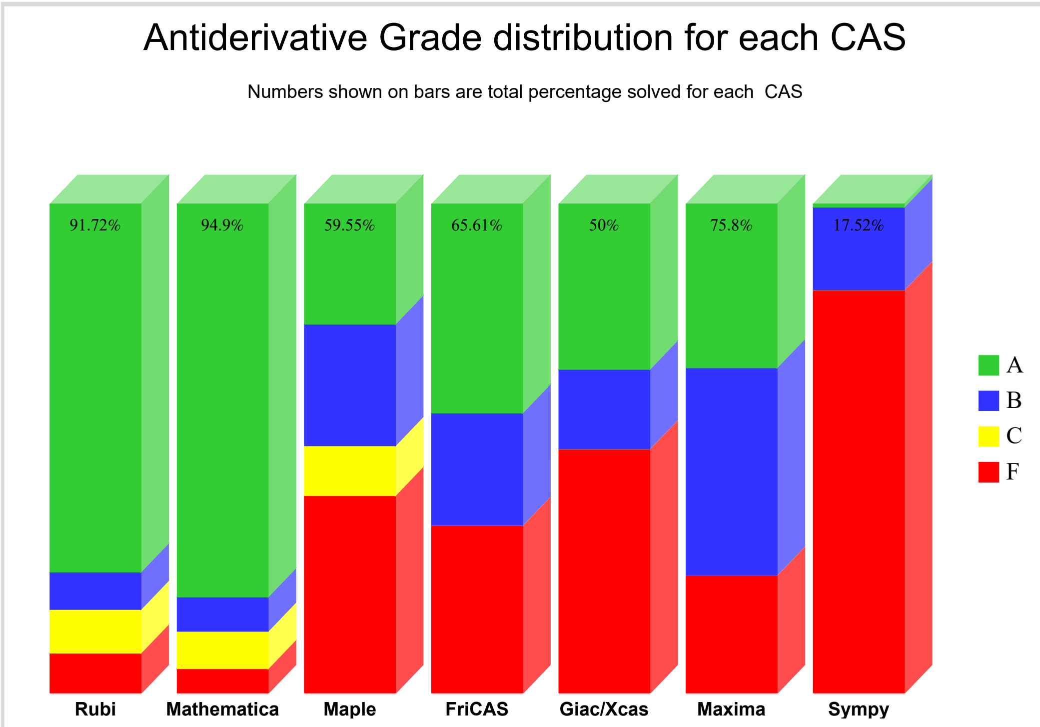
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives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

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

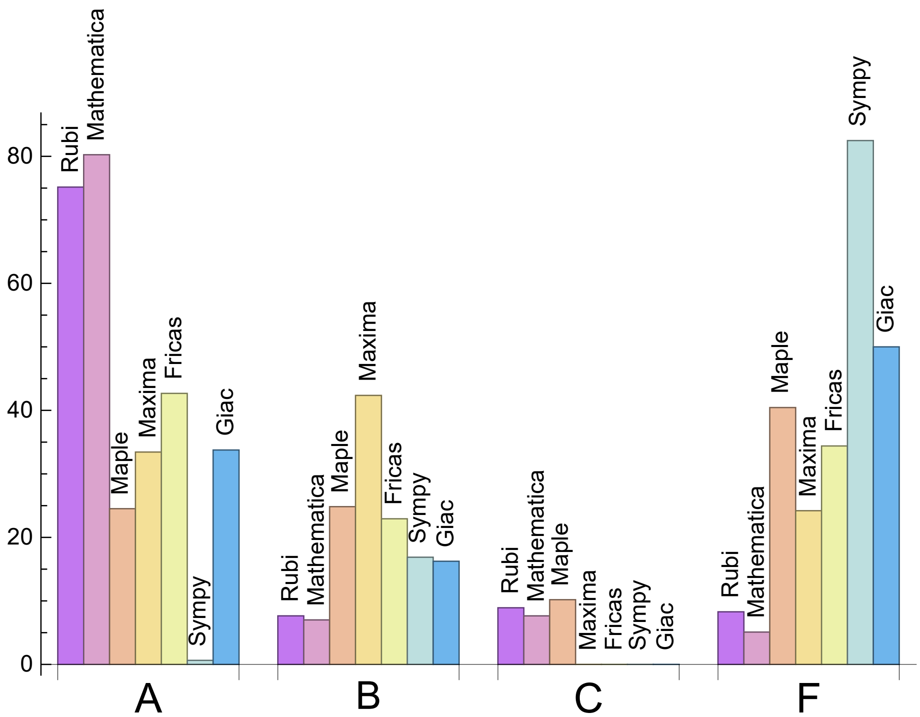
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	75.16	7.64	8.92	8.28
Mathematica	80.25	7.01	7.64	5.1
Maple	24.52	24.84	10.19	40.45
Maxima	33.44	42.36	0.	24.2
Fricas	42.68	22.93	0.	34.39
Sympy	0.64	16.88	0.	82.48
Giac	33.76	16.24	0.	50.

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



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



1.3 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.65	340.11	1.23	179.	1.
Mathematica	0.95	374.19	1.34	142.5	0.92
Maple	1.09	5560.3	16.06	452.	3.19
Maxima	1.18	855.13	3.02	497.5	3.2
Fricas	1.12	681.37	2.96	352.5	3.25
Sympy	9.12	691.69	3.78	677.	3.75
Giac	8.42	410.36	2.02	153.	1.63

1.4 list of integrals that has no closed form antiderivative

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

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

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

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

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

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

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

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

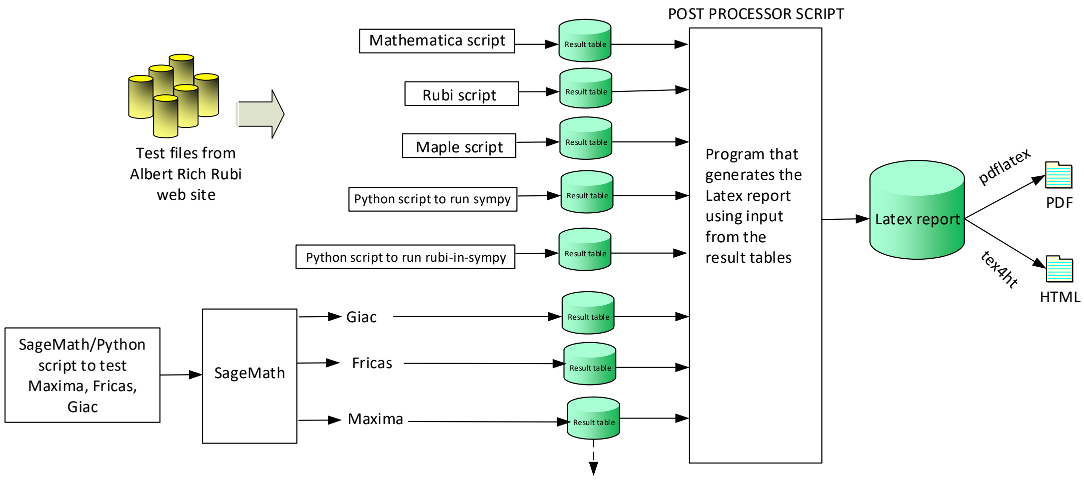
```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
         leafCount =1
```

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

1.10 Design of the test system

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



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

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

High level overview of the CAS independent integration test build system

Nasser M. Abbasi
June 22, 2018

Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

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

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

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

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

2.1.2 Mathematica

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

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

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

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

2.1.3 Maple

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

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

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

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

2.1.4 Maxima

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

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

C grade: { }

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

2.1.5 FriCAS

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

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

C grade: { }

F grade: { 5, 10, 11, 12, 13, 14, 33, 38, 39, 40, 41, 42, 62, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 92, 97, 98, 99, 100, 101, 123, 128, 129, 130, 131, 132, 140, 141, 145, 146, 151, 156, 157, 158, 159, 164, 165, 166, 167, 177, 182, 183, 184, 185, 186, 205, 210, 211, 212, 213, 214, 222, 223, 227, 228, 235, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 267, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 298, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.6 Sympy

A grade: { 234, 249 }

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

C grade: { }

F grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 92, 97, 98, 99, 100, 101, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 123, 128, 129, 130, 131, 132, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 177, 182, 183, 184, 185, 186, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 205, 210, 211, 212, 213, 214, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.1.7 Giac

A grade: { 4, 6, 7, 19, 20, 21, 24, 25, 26, 32, 34, 35, 47, 48, 49, 52, 53, 54, 55, 59, 60, 61, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 91, 93, 94, 109, 110, 111, 114, 115, 116, 122, 125, 136, 137, 138, 139, 142, 143, 144, 150, 152, 153, 176, 178, 179, 191, 192, 193, 196, 197, 198, 204, 206, 207, 218, 219, 220, 221, 224, 225, 226, 232, 233, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 264, 265, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 296, 297, 299 }

B grade: { 3, 8, 9, 30, 31, 36, 37, 63, 64, 65, 66, 88, 89, 90, 95, 96, 119, 120, 121, 124, 126, 127, 133, 147, 148, 149, 154, 155, 173, 174, 175, 180, 181, 199, 201, 202, 203, 208, 209, 215, 236, 237, 238, 239, 263, 269, 270, 295, 300, 301, 302 }

C grade: { }

F grade: { 1, 2, 5, 10, 11, 12, 13, 14, 15, 16, 17, 18, 22, 23, 27, 28, 29, 33, 38, 39, 40, 41, 42, 43, 44, 45, 46, 50, 51, 56, 57, 58, 62, 67, 68, 69, 70, 71, 72, 73, 74, 75, 92, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 112, 113, 117, 118, 123, 128, 129, 130, 131, 132, 134, 135, 140, 141, 145, 146, 151, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 177, 182, 183, 184, 185, 186, 187, 188, 189, 190, 194, 195, 200, 205, 210, 211, 212, 213, 214, 216, 217, 222, 223, 227, 228, 229, 230, 231, 234, 235, 240, 241, 242, 243, 244, 245, 246, 247, 248, 262, 266, 267, 268, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 293, 294, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	146	0	913	1188	0	0
normalized size	1	1.	0.78	0.	4.86	6.32	0.	0.
time (sec)	N/A	0.143	0.129	0.546	1.28	1.183	0.	0.

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	124	0	647	883	0	0
normalized size	1	1.	0.79	0.	4.15	5.66	0.	0.
time (sec)	N/A	0.106	0.11	0.405	1.236	1.07	0.	0.

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	103	0	417	622	0	354
normalized size	1	1.	0.83	0.	3.36	5.02	0.	2.85
time (sec)	N/A	0.09	0.062	0.402	1.211	0.906	0.	26.721

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	73	0	211	360	0	167
normalized size	1	1.	0.85	0.	2.45	4.19	0.	1.94
time (sec)	N/A	0.061	0.04	0.322	1.133	0.949	0.	3.651

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	126	101	0	0	0	0	0
normalized size	1	1.5	1.2	0.	0.	0.	0.	0.
time (sec)	N/A	0.209	0.054	0.529	0.	0.	0.	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	67	108	115	0	185	221	0	162
normalized size	1	1.61	1.72	0.	2.76	3.3	0.	2.42
time (sec)	N/A	0.09	0.063	0.449	1.214	0.797	0.	1.423

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	114	0	350	562	0	351
normalized size	1	1.	0.75	0.	2.32	3.72	0.	2.32
time (sec)	N/A	0.123	0.162	0.436	1.212	0.991	0.	1.571

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	145	0	583	990	0	655
normalized size	1	1.	0.79	0.	3.19	5.41	0.	3.58
time (sec)	N/A	0.152	0.185	0.437	1.263	0.879	0.	1.367

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	215	215	162	0	879	1505	0	1038
normalized size	1	1.	0.75	0.	4.09	7.	0.	4.83
time (sec)	N/A	0.189	0.26	0.437	1.348	1.066	0.	1.422

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	396	602	535	0	3976	0	0	0
normalized size	1	1.52	1.35	0.	10.04	0.	0.	0.
time (sec)	N/A	0.871	0.525	0.427	3.824	0.	0.	0.

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	335	512	411	0	2936	0	0	0
normalized size	1	1.53	1.23	0.	8.76	0.	0.	0.
time (sec)	N/A	0.707	0.36	0.433	3.801	0.	0.	0.

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	274	420	303	0	2026	0	0	0
normalized size	1	1.53	1.11	0.	7.39	0.	0.	0.
time (sec)	N/A	0.583	0.237	0.426	3.682	0.	0.	0.

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	196	309	215	0	1118	0	0	0
normalized size	1	1.58	1.1	0.	5.7	0.	0.	0.
time (sec)	N/A	0.443	0.2	0.276	3.81	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	789	537	0	0	0	0	0
normalized size	1	5.72	3.89	0.	0.	0.	0.	0.
time (sec)	N/A	3.573	0.416	0.437	0.	0.	0.	0.

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	512	330	0	581	555	0	0
normalized size	1	3.76	2.43	0.	4.27	4.08	0.	0.
time (sec)	N/A	0.84	0.599	0.436	1.231	0.928	0.	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	288	626	463	0	1162	1354	0	0
normalized size	1	2.17	1.61	0.	4.03	4.7	0.	0.
time (sec)	N/A	0.923	0.553	0.44	1.373	0.979	0.	0.

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	448	736	609	0	1933	2383	0	0
normalized size	1	1.64	1.36	0.	4.31	5.32	0.	0.
time (sec)	N/A	1.087	0.803	0.439	1.639	1.067	0.	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	615	826	776	0	2884	3615	0	0
normalized size	1	1.34	1.26	0.	4.69	5.88	0.	0.
time (sec)	N/A	1.314	1.188	0.451	2.032	1.158	0.	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.233	0.749	0.401	0.	0.	0.	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.115	0.284	0.307	0.	0.	0.	0.

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.081	0.144	0.546	0.	0.	0.	0.

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	94	0	94	0	0	149	0	0
normalized size	1	0.	1.	0.	0.	1.59	0.	0.
time (sec)	N/A	0.099	0.131	0.444	0.	0.868	0.	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	197	0	172	0	0	354	0	0
normalized size	1	0.	0.87	0.	0.	1.8	0.	0.
time (sec)	N/A	0.082	0.297	0.437	0.	0.936	0.	0.

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.238	0.983	0.395	0.	0.	0.	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.126	0.934	0.254	0.	0.	0.	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.091	0.531	0.437	0.	0.	0.	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	153	0	146	0	0	598	0	0
normalized size	1	0.	0.95	0.	0.	3.91	0.	0.
time (sec)	N/A	0.105	0.183	0.441	0.	0.931	0.	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	314	0	254	0	0	1612	0	0
normalized size	1	0.	0.81	0.	0.	5.13	0.	0.
time (sec)	N/A	0.093	0.644	0.438	0.	0.953	0.	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	146	0	913	1188	0	0
normalized size	1	1.	0.78	0.	4.86	6.32	0.	0.
time (sec)	N/A	0.128	0.105	0.522	1.243	1.069	0.	0.

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	156	156	124	0	647	883	0	537
normalized size	1	1.	0.79	0.	4.15	5.66	0.	3.44
time (sec)	N/A	0.102	0.094	0.411	1.255	1.071	0.	143.004

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	101	0	417	622	0	354
normalized size	1	1.	0.81	0.	3.36	5.02	0.	2.85
time (sec)	N/A	0.081	0.06	0.404	1.195	0.975	0.	21.472

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	86	74	0	211	360	0	173
normalized size	1	1.	0.86	0.	2.45	4.19	0.	2.01
time (sec)	N/A	0.06	0.038	0.328	1.142	0.805	0.	3.045

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	128	101	0	0	0	0	0
normalized size	1	1.6	1.26	0.	0.	0.	0.	0.
time (sec)	N/A	0.201	0.039	0.531	0.	0.	0.	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	107	114	0	184	221	0	166
normalized size	1	1.05	1.12	0.	1.8	2.17	0.	1.63
time (sec)	N/A	0.087	0.06	0.438	1.175	0.909	0.	1.369

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	115	0	350	562	0	351
normalized size	1	1.	0.76	0.	2.32	3.72	0.	2.32
time (sec)	N/A	0.114	0.148	0.444	1.208	0.794	0.	1.4

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	146	0	585	990	0	655
normalized size	1	1.	0.8	0.	3.2	5.41	0.	3.58
time (sec)	N/A	0.143	0.177	0.449	1.259	0.934	0.	1.459

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	215	215	162	0	880	1505	0	1038
normalized size	1	1.	0.75	0.	4.09	7.	0.	4.83
time (sec)	N/A	0.176	0.237	0.455	1.255	1.	0.	1.341

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	544	634	533	0	3888	0	0	0
normalized size	1	1.17	0.98	0.	7.15	0.	0.	0.
time (sec)	N/A	0.88	0.504	0.441	3.792	0.	0.	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	454	544	409	0	2874	0	0	0
normalized size	1	1.2	0.9	0.	6.33	0.	0.	0.
time (sec)	N/A	0.684	0.339	0.429	3.632	0.	0.	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	454	303	0	1989	0	0	0
normalized size	1	1.26	0.84	0.	5.51	0.	0.	0.
time (sec)	N/A	0.567	0.24	0.43	3.604	0.	0.	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	307	216	0	1114	0	0	0
normalized size	1	1.4	0.98	0.	5.06	0.	0.	0.
time (sec)	N/A	0.423	0.212	0.277	3.549	0.	0.	0.

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	782	537	0	0	0	0	0
normalized size	1	5.71	3.92	0.	0.	0.	0.	0.
time (sec)	N/A	3.302	0.4	0.444	0.	0.	0.	0.

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	514	331	0	578	555	0	0
normalized size	1	3.15	2.03	0.	3.55	3.4	0.	0.
time (sec)	N/A	0.774	0.446	0.441	1.26	0.88	0.	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	317	626	464	0	1162	1354	0	0
normalized size	1	1.97	1.46	0.	3.67	4.27	0.	0.
time (sec)	N/A	0.915	0.492	0.441	1.383	0.97	0.	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	429	736	609	0	1937	2383	0	0
normalized size	1	1.72	1.42	0.	4.52	5.55	0.	0.
time (sec)	N/A	1.098	0.775	0.441	1.62	1.062	0.	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	F	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	536	826	776	0	2886	3615	0	0
normalized size	1	1.54	1.45	0.	5.38	6.74	0.	0.
time (sec)	N/A	1.295	1.086	0.442	2.03	1.286	0.	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.214	0.438	0.398	0.	0.	0.	0.

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.115	0.283	0.303	0.	0.	0.	0.

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.083	0.174	0.54	0.	0.	0.	0.

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	96	0	96	0	0	149	0	0
normalized size	1	0.	1.	0.	0.	1.55	0.	0.
time (sec)	N/A	0.1	0.119	0.438	0.	0.904	0.	0.

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	199	0	174	0	0	351	0	0
normalized size	1	0.	0.87	0.	0.	1.76	0.	0.
time (sec)	N/A	0.083	0.29	0.435	0.	0.889	0.	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.233	0.989	0.392	0.	0.	0.	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	35	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.124	0.959	0.243	0.	0.	0.	0.

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.09	0.536	0.427	0.	0.	0.	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	A
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	154	0	180	0	0	635	0	396
normalized size	1	0.	1.17	0.	0.	4.12	0.	2.57
time (sec)	N/A	0.104	0.171	0.438	0.	0.756	0.	1.459

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	256	0	288	0	0	1648	0	0
normalized size	1	0.	1.12	0.	0.	6.44	0.	0.
time (sec)	N/A	0.094	0.565	0.439	0.	0.898	0.	0.

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	364	348	285	0	852	1488	0	0
normalized size	1	0.96	0.78	0.	2.34	4.09	0.	0.
time (sec)	N/A	0.603	0.65	0.438	1.26	3.133	0.	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	235	235	219	0	598	1053	0	0
normalized size	1	1.	0.93	0.	2.54	4.48	0.	0.
time (sec)	N/A	0.359	0.288	0.403	1.204	1.501	0.	0.

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	157	146	0	381	695	0	366
normalized size	1	1.	0.93	0.	2.43	4.43	0.	2.33
time (sec)	N/A	0.18	0.144	0.41	1.182	1.205	0.	81.826

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	120	0	203	390	0	182
normalized size	1	1.	1.04	0.	1.77	3.39	0.	1.58
time (sec)	N/A	0.105	0.128	0.32	1.095	0.925	0.	5.301

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	56	56	122	70	158	0	72
normalized size	1	1.	1.	2.18	1.25	2.82	0.	1.29
time (sec)	N/A	0.033	0.009	0.049	1.177	0.841	0.	1.39

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	147	147	122	0	0	0	0	0
normalized size	1	1.	0.83	0.	0.	0.	0.	0.
time (sec)	N/A	0.226	0.058	0.616	0.	0.	0.	0.

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	119	109	0	192	652	0	390
normalized size	1	1.31	1.2	0.	2.11	7.16	0.	4.29
time (sec)	N/A	0.125	0.183	0.513	1.184	17.469	0.	1.332

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	190	190	173	0	479	0	0	1165
normalized size	1	1.	0.91	0.	2.52	0.	0.	6.13
time (sec)	N/A	0.236	0.695	0.513	1.292	0.	0.	1.882

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	283	283	264	0	1150	0	0	2925
normalized size	1	1.	0.93	0.	4.06	0.	0.	10.34
time (sec)	N/A	0.458	1.021	0.507	1.549	0.	0.	3.999

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	388	388	359	0	2377	0	0	5863
normalized size	1	1.	0.93	0.	6.13	0.	0.	15.11
time (sec)	N/A	0.713	1.355	0.502	1.968	0.	0.	14.539

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	923	1060	757	0	3579	0	0	0
normalized size	1	1.15	0.82	0.	3.88	0.	0.	0.
time (sec)	N/A	1.835	1.041	0.428	3.997	0.	0.	0.

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	565	699	506	0	2240	0	0	0
normalized size	1	1.24	0.9	0.	3.96	0.	0.	0.
time (sec)	N/A	1.15	0.565	0.421	3.788	0.	0.	0.

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	290	481	362	0	1214	0	0	0
normalized size	1	1.66	1.25	0.	4.19	0.	0.	0.
time (sec)	N/A	0.831	0.328	0.274	3.5	0.	0.	0.

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	275	226	0	0	0	0	0
normalized size	1	2.04	1.67	0.	0.	0.	0.	0.
time (sec)	N/A	0.617	0.17	0.309	0.	0.	0.	0.

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	297	2233	1441	0	0	0	0	0
normalized size	1	7.52	4.85	0.	0.	0.	0.	0.
time (sec)	N/A	5.184	0.473	0.528	0.	0.	0.	0.

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	657	418	0	0	0	0	0
normalized size	1	3.19	2.03	0.	0.	0.	0.	0.
time (sec)	N/A	1.134	0.738	0.516	0.	0.	0.	0.

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	389	941	615	0	0	0	0	0
normalized size	1	2.42	1.58	0.	0.	0.	0.	0.
time (sec)	N/A	1.561	2.238	0.512	0.	0.	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	747	1427	918	0	0	0	0	0
normalized size	1	1.91	1.23	0.	0.	0.	0.	0.
time (sec)	N/A	2.5	4.487	0.511	0.	0.	0.	0.

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1208	1968	1476	0	0	0	0	0
normalized size	1	1.63	1.22	0.	0.	0.	0.	0.
time (sec)	N/A	3.545	7.323	0.52	0.	0.	0.	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.189	0.414	0.396	0.	0.	0.	0.

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.102	0.279	0.305	0.	0.	0.	0.

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.015	0.015	0.282	0.	0.	0.	0.

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.071	0.933	0.625	0.	0.	0.	0.

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.075	1.058	0.506	0.	0.	0.	0.

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.072	11.991	0.53	0.	0.	0.	0.

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.207	0.935	0.418	0.	0.	0.	0.

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.114	0.696	0.253	0.	0.	0.	0.

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.015	0.593	0.321	0.	0.	0.	0.

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.078	1.609	0.549	0.	0.	0.	0.

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.081	4.214	0.509	0.	0.	0.	0.

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.08	36.63	0.521	0.	0.	0.	0.

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	180	180	142	8417	841	910	993	639
normalized size	1	1.	0.79	46.76	4.67	5.06	5.52	3.55
time (sec)	N/A	0.124	0.106	0.225	1.2	1.364	10.017	99.387

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	120	5556	593	664	719	458
normalized size	1	1.	0.81	37.29	3.98	4.46	4.83	3.07
time (sec)	N/A	0.096	0.098	0.18	1.222	1.137	7.131	21.887

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	99	3283	378	467	503	309
normalized size	1	1.	0.84	27.82	3.2	3.96	4.26	2.62
time (sec)	N/A	0.079	0.054	0.162	1.173	1.092	5.218	4.757

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	69	1544	194	278	257	150
normalized size	1	1.	0.85	19.06	2.4	3.43	3.17	1.85
time (sec)	N/A	0.053	0.034	0.158	1.105	1.055	4.45	1.804

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	120	95	602	0	0	0	0
normalized size	1	1.5	1.19	7.52	0.	0.	0.	0.
time (sec)	N/A	0.217	0.042	0.089	0.	0.	0.	0.

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	102	105	373	178	177	231	157
normalized size	1	1.62	1.67	5.92	2.83	2.81	3.67	2.49
time (sec)	N/A	0.079	0.059	0.047	1.159	1.074	2.56	1.36

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	110	777	344	455	422	329
normalized size	1	1.	0.76	5.4	2.39	3.16	2.93	2.28
time (sec)	N/A	0.1	0.135	0.049	1.085	1.004	4.515	1.346

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	141	1191	578	826	656	609
normalized size	1	1.	0.81	6.81	3.3	4.72	3.75	3.48
time (sec)	N/A	0.13	0.163	0.052	1.225	1.051	6.864	1.413

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	158	1607	873	1284	944	967
normalized size	1	1.	0.77	7.8	4.24	6.23	4.58	4.69
time (sec)	N/A	0.157	0.229	0.051	1.396	1.072	11.107	1.378

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	557	511	0	3225	0	0	0
normalized size	1	1.53	1.4	0.	8.84	0.	0.	0.
time (sec)	N/A	0.855	0.498	2.536	1.832	0.	0.	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	309	474	391	0	2338	0	0	0
normalized size	1	1.53	1.27	0.	7.57	0.	0.	0.
time (sec)	N/A	0.646	0.335	2.177	1.753	0.	0.	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	253	389	287	0	1573	0	0	0
normalized size	1	1.54	1.13	0.	6.22	0.	0.	0.
time (sec)	N/A	0.553	0.221	1.991	2.033	0.	0.	0.

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	180	285	203	0	825	0	0	0
normalized size	1	1.58	1.13	0.	4.58	0.	0.	0.
time (sec)	N/A	0.456	0.177	1.642	1.545	0.	0.	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	728	250	1186	0	0	0	0
normalized size	1	5.69	1.95	9.27	0.	0.	0.	0.
time (sec)	N/A	3.416	0.604	0.069	0.	0.	0.	0.

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	470	314	828	562	319	432	0
normalized size	1	3.73	2.49	6.57	4.46	2.53	3.43	0.
time (sec)	N/A	0.772	0.473	0.049	1.285	1.02	4.335	0.

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	577	443	1715	1145	767	892	0
normalized size	1	2.15	1.65	6.4	4.27	2.86	3.33	0.
time (sec)	N/A	0.91	0.517	0.049	1.467	1.093	7.643	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	418	680	585	2624	1916	1388	1544	0
normalized size	1	1.63	1.4	6.28	4.58	3.32	3.69	0.
time (sec)	N/A	1.059	0.766	0.05	1.858	1.105	36.911	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	575	763	748	3538	2866	2152	0	0
normalized size	1	1.33	1.3	6.15	4.98	3.74	0.	0.
time (sec)	N/A	1.227	1.11	0.049	2.184	1.164	0.	0.

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	28	29	114	30	213	63	0	0
normalized size	1	1.04	4.07	1.07	7.61	2.25	0.	0.
time (sec)	N/A	0.022	0.05	0.048	1.238	0.975	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	15	15	140	15	82	53	0	0
normalized size	1	1.	9.33	1.	5.47	3.53	0.	0.
time (sec)	N/A	0.014	0.014	0.045	1.22	0.953	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	133	17	80	53	0	0
normalized size	1	1.	10.23	1.31	6.15	4.08	0.	0.
time (sec)	N/A	0.013	0.014	0.044	1.086	0.98	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.2	0.594	1.126	0.	0.	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.101	0.236	0.961	0.	0.	0.	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.072	0.225	1.183	0.	0.	0.	0.

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	50	0	52	0	0	108	0	0
normalized size	1	0.	1.04	0.	0.	2.16	0.	0.
time (sec)	N/A	0.09	0.102	1.187	0.	1.03	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	107	0	89	0	0	288	0	0
normalized size	1	0.	0.83	0.	0.	2.69	0.	0.
time (sec)	N/A	0.073	0.165	1.283	0.	1.01	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.206	1.323	1.042	0.	0.	0.	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.107	0.913	1.043	0.	0.	0.	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.081	0.618	1.042	0.	0.	0.	0.

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	103	0	87	0	0	423	0	0
normalized size	1	0.	0.84	0.	0.	4.11	0.	0.
time (sec)	N/A	0.095	0.188	1.274	0.	1.022	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	212	0	136	0	0	1187	0	0
normalized size	1	0.	0.64	0.	0.	5.6	0.	0.
time (sec)	N/A	0.084	0.757	1.43	0.	1.109	0.	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	182	182	144	1606	1195	952	1018	670
normalized size	1	1.	0.79	8.82	6.57	5.23	5.59	3.68
time (sec)	N/A	0.11	0.096	0.423	1.381	1.303	8.432	162.17

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	122	1249	873	709	722	487
normalized size	1	1.	0.81	8.27	5.78	4.7	4.78	3.23
time (sec)	N/A	0.097	0.09	0.24	1.361	1.163	5.739	27.501

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	98	915	590	508	527	340
normalized size	1	1.	0.82	7.62	4.92	4.23	4.39	2.83
time (sec)	N/A	0.074	0.052	0.243	1.283	1.098	4.005	4.798

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	72	560	338	329	253	177
normalized size	1	1.	0.92	7.18	4.33	4.22	3.24	2.27
time (sec)	N/A	0.057	0.036	0.235	1.228	1.085	2.465	1.742

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	122	88	552	0	0	0	0
normalized size	1	1.47	1.06	6.65	0.	0.	0.	0.
time (sec)	N/A	0.292	0.037	0.375	0.	0.	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	105	111	157	252	228	253	254
normalized size	1	1.62	1.71	2.42	3.88	3.51	3.89	3.91
time (sec)	N/A	0.077	0.058	0.079	1.24	1.015	1.913	1.392

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	109	355	414	495	418	356
normalized size	1	1.	0.79	2.57	3.	3.59	3.03	2.58
time (sec)	N/A	0.093	0.136	0.108	1.294	1.051	3.176	1.319

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	140	579	648	869	677	639
normalized size	1	1.	0.79	3.27	3.66	4.91	3.82	3.61
time (sec)	N/A	0.115	0.135	0.148	1.238	1.072	5.492	1.333

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	162	833	944	1328	947	566
normalized size	1	1.	0.78	4.	4.54	6.38	4.55	2.72
time (sec)	N/A	0.144	0.201	0.207	1.398	1.085	8.269	1.445

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	377	569	523	0	3578	0	0	0
normalized size	1	1.51	1.39	0.	9.49	0.	0.	0.
time (sec)	N/A	0.872	0.466	1.7	2.09	0.	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	319	470	402	0	2630	0	0	0
normalized size	1	1.47	1.26	0.	8.24	0.	0.	0.
time (sec)	N/A	0.76	0.328	1.577	1.99	0.	0.	0.

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	255	397	298	0	1790	0	0	0
normalized size	1	1.56	1.17	0.	7.02	0.	0.	0.
time (sec)	N/A	0.621	0.221	1.503	1.719	0.	0.	0.

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	291	207	0	981	0	0	0
normalized size	1	1.55	1.1	0.	5.22	0.	0.	0.
time (sec)	N/A	0.493	0.174	1.273	1.584	0.	0.	0.

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	132	749	257	0	0	0	0	0
normalized size	1	5.67	1.95	0.	0.	0.	0.	0.
time (sec)	N/A	4.141	0.327	1.374	0.	0.	0.	0.

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	130	480	321	357	775	416	452	510
normalized size	1	3.69	2.47	2.75	5.96	3.2	3.48	3.92
time (sec)	N/A	0.888	0.451	0.09	1.482	0.998	3.797	1.476

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	272	579	451	815	1351	846	877	0
normalized size	1	2.13	1.66	3.	4.97	3.11	3.22	0.
time (sec)	N/A	1.046	0.49	0.139	1.857	1.046	6.77	0.

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	429	692	598	1343	2126	1474	1561	0
normalized size	1	1.61	1.39	3.13	4.96	3.44	3.64	0.
time (sec)	N/A	1.225	0.713	0.204	2.817	1.136	35.215	0.

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	587	757	762	1943	3077	2229	0	1180
normalized size	1	1.29	1.3	3.31	5.24	3.8	0.	2.01
time (sec)	N/A	1.394	1.029	0.297	2.26	1.208	0.	1.648

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.197	0.158	0.986	0.	0.	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.101	0.115	0.857	0.	0.	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.073	0.07	1.065	0.	0.	0.	0.

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.087	0.074	1.091	0.	0.	0.	0.

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	149	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.074	0.08	1.153	0.	0.	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.215	0.467	0.933	0.	0.	0.	0.

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.114	0.345	0.935	0.	0.	0.	0.

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.081	0.14	0.902	0.	0.	0.	0.

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	147	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.094	0.179	1.224	0.	0.	0.	0.

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	263	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.082	0.348	1.471	0.	0.	0.	0.

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	183	364	2374	906	1188	0	671
normalized size	1	1.07	2.13	13.88	5.3	6.95	0.	3.92
time (sec)	N/A	0.183	0.784	0.833	1.295	1.093	0.	13.996

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	154	273	1840	630	871	0	479
normalized size	1	1.08	1.92	12.96	4.44	6.13	0.	3.37
time (sec)	N/A	0.135	0.473	0.564	1.247	1.066	0.	5.425

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	125	194	1325	397	599	0	317
normalized size	1	1.11	1.72	11.73	3.51	5.3	0.	2.81
time (sec)	N/A	0.121	0.282	0.527	1.282	1.04	0.	2.295

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	96	126	817	208	354	0	171
normalized size	1	1.14	1.5	9.73	2.48	4.21	0.	2.04
time (sec)	N/A	0.091	0.146	0.51	1.157	1.074	0.	1.704

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	87	129	523	0	0	0	0
normalized size	1	1.1	1.63	6.62	0.	0.	0.	0.
time (sec)	N/A	0.268	0.097	1.534	0.	0.	0.	0.

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	72	89	823	157	242	0	146
normalized size	1	0.74	0.92	8.48	1.62	2.49	0.	1.51
time (sec)	N/A	0.084	0.09	0.4	1.186	1.066	0.	1.262

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	149	121	1379	311	639	0	323
normalized size	1	1.09	0.88	10.07	2.27	4.66	0.	2.36
time (sec)	N/A	0.154	0.338	0.425	1.147	1.044	0.	1.273

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	166	178	143	1976	540	1123	0	605
normalized size	1	1.07	0.86	11.9	3.25	6.77	0.	3.64
time (sec)	N/A	0.17	0.4	0.475	1.252	1.132	0.	1.293

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	207	165	2583	834	1697	0	959
normalized size	1	1.06	0.85	13.25	4.28	8.7	0.	4.92
time (sec)	N/A	0.193	0.396	0.509	1.78	1.18	0.	1.371

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	322	542	1709	26948	2526	0	0	0
normalized size	1	1.68	5.31	83.69	7.84	0.	0.	0.
time (sec)	N/A	0.772	1.551	2.524	3.86	0.	0.	0.

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	427	1149	19969	1733	0	0	0
normalized size	1	1.62	4.37	75.93	6.59	0.	0.	0.
time (sec)	N/A	0.626	1.027	2.135	3.735	0.	0.	0.

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	195	308	656	10210	1052	0	0	0
normalized size	1	1.58	3.36	52.36	5.39	0.	0.	0.
time (sec)	N/A	0.486	0.709	1.651	3.611	0.	0.	0.

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	227	269	0	0	0	0	0
normalized size	1	1.73	2.05	0.	0.	0.	0.	0.
time (sec)	N/A	0.504	0.18	2.042	0.	0.	0.	0.

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	189	236	10098	606	755	0	0
normalized size	1	1.47	1.83	78.28	4.7	5.85	0.	0.
time (sec)	N/A	0.182	0.371	1.365	1.255	1.115	0.	0.

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	274	411	332	17300	1214	1918	0	0
normalized size	1	1.5	1.21	63.14	4.43	7.	0.	0.
time (sec)	N/A	0.423	0.53	1.968	1.473	1.219	0.	0.

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	427	730	432	25057	2025	3351	0	0
normalized size	1	1.71	1.01	58.68	4.74	7.85	0.	0.
time (sec)	N/A	1.212	0.743	2.658	1.708	1.402	0.	0.

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	587	843	1011	33370	3021	5029	0	0
normalized size	1	1.44	1.72	56.85	5.15	8.57	0.	0.
time (sec)	N/A	1.408	1.071	3.333	2.056	1.699	0.	0.

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	809	1203	9054	0	0	0	0	0
normalized size	1	1.49	11.19	0.	0.	0.	0.	0.
time (sec)	N/A	2.404	9.696	5.133	0.	0.	0.	0.

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	614	915	5668	0	0	0	0	0
normalized size	1	1.49	9.23	0.	0.	0.	0.	0.
time (sec)	N/A	1.737	4.111	4.456	0.	0.	0.	0.

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	376	700	3813	0	0	0	0	0
normalized size	1	1.86	10.14	0.	0.	0.	0.	0.
time (sec)	N/A	1.183	2.971	6.112	0.	0.	0.	0.

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	186	424	2513	0	0	0	0	0
normalized size	1	2.28	13.51	0.	0.	0.	0.	0.
time (sec)	N/A	0.851	1.023	2.592	0.	0.	0.	0.

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	184	360	524	69354	1524	1808	0	0
normalized size	1	1.96	2.85	376.92	8.28	9.83	0.	0.
time (sec)	N/A	0.315	0.757	11.812	1.507	1.23	0.	0.

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	390	811	693	120138	3032	4618	0	0
normalized size	1	2.08	1.78	308.05	7.77	11.84	0.	0.
time (sec)	N/A	0.804	1.154	18.137	1.973	1.494	0.	0.

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	611	1876	1003	175812	4901	8181	0	0
normalized size	1	3.07	1.64	287.74	8.02	13.39	0.	0.
time (sec)	N/A	3.432	1.476	27.216	2.6	1.862	0.	0.

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	A	C	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	830	2173	1370	236754	7128	12382	0	0
normalized size	1	2.62	1.65	285.25	8.59	14.92	0.	0.
time (sec)	N/A	4.675	2.251	33.085	3.309	2.45	0.	0.

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	A	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	96	0	0	0	0	149	0	0
normalized size	1	0.	0.	0.	0.	1.55	0.	0.
time (sec)	N/A	0.1	0.08	3.688	0.	1.03	0.	0.

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	180	180	142	2930	836	910	993	635
normalized size	1	1.	0.79	16.28	4.64	5.06	5.52	3.53
time (sec)	N/A	0.124	0.101	0.201	1.298	1.352	8.532	89.529

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	149	120	2191	589	664	719	460
normalized size	1	1.	0.81	14.7	3.95	4.46	4.83	3.09
time (sec)	N/A	0.101	0.08	0.158	1.168	1.157	5.867	20.928

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	99	1537	375	467	503	305
normalized size	1	1.	0.84	13.03	3.18	3.96	4.26	2.58
time (sec)	N/A	0.081	0.051	0.159	1.203	1.068	4.003	4.949

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	69	951	193	278	257	153
normalized size	1	1.	0.85	11.74	2.38	3.43	3.17	1.89
time (sec)	N/A	0.055	0.037	0.161	1.166	1.067	2.549	2.277

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	122	95	419	0	0	0	0
normalized size	1	1.51	1.17	5.17	0.	0.	0.	0.
time (sec)	N/A	0.211	0.043	0.057	0.	0.	0.	0.

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	64	101	86	520	181	177	231	151
normalized size	1	1.58	1.34	8.12	2.83	2.77	3.61	2.36
time (sec)	N/A	0.077	0.059	0.051	1.116	1.017	1.831	1.328

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	128	753	344	455	422	327
normalized size	1	1.	0.89	5.23	2.39	3.16	2.93	2.27
time (sec)	N/A	0.104	0.098	0.053	1.241	1.024	3.239	1.39

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	141	1012	578	826	656	609
normalized size	1	1.	0.81	5.78	3.3	4.72	3.75	3.48
time (sec)	N/A	0.131	0.158	0.056	1.267	1.02	5.23	1.398

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	166	1306	873	1284	944	967
normalized size	1	1.	0.81	6.34	4.24	6.23	4.58	4.69
time (sec)	N/A	0.149	0.202	0.053	1.169	1.108	7.936	1.357

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	503	557	512	0	3233	0	0	0
normalized size	1	1.11	1.02	0.	6.43	0.	0.	0.
time (sec)	N/A	0.818	0.524	2.313	1.847	0.	0.	0.

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	420	474	392	0	2342	0	0	0
normalized size	1	1.13	0.93	0.	5.58	0.	0.	0.
time (sec)	N/A	0.648	0.355	1.958	1.69	0.	0.	0.

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	335	389	290	0	1582	0	0	0
normalized size	1	1.16	0.87	0.	4.72	0.	0.	0.
time (sec)	N/A	0.556	0.239	1.943	1.761	0.	0.	0.

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	284	203	0	836	0	0	0
normalized size	1	1.41	1.	0.	4.14	0.	0.	0.
time (sec)	N/A	0.418	0.186	1.7	1.69	0.	0.	0.

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	128	719	251	906	0	0	0	0
normalized size	1	5.62	1.96	7.08	0.	0.	0.	0.
time (sec)	N/A	4.423	0.276	0.067	0.	0.	0.	0.

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	470	314	1251	562	319	430	0
normalized size	1	3.07	2.05	8.18	3.67	2.08	2.81	0.
time (sec)	N/A	0.762	0.495	0.05	1.295	1.012	3.758	0.

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	296	578	444	1934	1143	767	892	0
normalized size	1	1.95	1.5	6.53	3.86	2.59	3.01	0.
time (sec)	N/A	0.91	0.476	0.053	1.547	1.075	6.71	0.

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	399	680	585	2758	1917	1388	1544	0
normalized size	1	1.7	1.47	6.91	4.8	3.48	3.87	0.
time (sec)	N/A	1.074	0.79	0.055	1.781	1.302	34.789	0.

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	498	763	748	3717	2865	2152	0	0
normalized size	1	1.53	1.5	7.46	5.75	4.32	0.	0.
time (sec)	N/A	1.264	1.061	0.054	2.29	1.387	0.	0.

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.196	0.587	1.224	0.	0.	0.	0.

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.101	0.237	1.047	0.	0.	0.	0.

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.073	0.235	1.347	0.	0.	0.	0.

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	A	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	53	0	50	69	0	109	0	0
normalized size	1	0.	0.94	1.3	0.	2.06	0.	0.
time (sec)	N/A	0.086	0.064	0.286	0.	0.98	0.	0.

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	A	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	109	0	89	0	0	286	0	0
normalized size	1	0.	0.82	0.	0.	2.62	0.	0.
time (sec)	N/A	0.072	0.158	1.425	0.	0.977	0.	0.

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.206	1.355	1.11	0.	0.	0.	0.

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.106	0.945	1.129	0.	0.	0.	0.

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.079	0.514	1.079	0.	0.	0.	0.

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	B	F	B	F(-1)	B
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	104	0	88	258	0	439	0	344
normalized size	1	0.	0.85	2.48	0.	4.22	0.	3.31
time (sec)	N/A	0.089	0.125	0.16	0.	0.97	0.	1.416

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	A	F	F	B	F(-1)	F
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	159	0	135	0	0	1212	0	0
normalized size	1	0.	0.85	0.	0.	7.62	0.	0.
time (sec)	N/A	0.08	0.431	1.582	0.	1.068	0.	0.

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	182	182	144	1030	1191	952	1018	666
normalized size	1	1.	0.79	5.66	6.54	5.23	5.59	3.66
time (sec)	N/A	0.118	0.101	0.415	1.348	1.279	8.817	162.637

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	122	788	871	709	722	491
normalized size	1	1.	0.81	5.22	5.77	4.7	4.78	3.25
time (sec)	N/A	0.098	0.074	0.243	1.373	1.181	6.026	26.115

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	98	569	589	508	527	335
normalized size	1	1.	0.82	4.74	4.91	4.23	4.39	2.79
time (sec)	N/A	0.078	0.051	0.241	1.331	1.113	4.156	4.722

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	72	340	338	329	253	173
normalized size	1	1.	0.92	4.36	4.33	4.22	3.24	2.22
time (sec)	N/A	0.052	0.037	0.242	1.249	1.105	2.545	1.744

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	121	87	265	0	0	0	0
normalized size	1	1.46	1.05	3.19	0.	0.	0.	0.
time (sec)	N/A	0.292	0.037	0.335	0.	0.	0.	0.

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	105	89	212	252	228	253	254
normalized size	1	1.03	0.87	2.08	2.47	2.24	2.48	2.49
time (sec)	N/A	0.076	0.052	0.062	1.233	1.038	1.939	1.381

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	139	128	300	413	495	418	350
normalized size	1	1.	0.92	2.16	2.97	3.56	3.01	2.52
time (sec)	N/A	0.101	0.096	0.06	1.22	1.005	3.269	1.342

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	140	427	648	869	677	639
normalized size	1	1.	0.79	2.41	3.66	4.91	3.82	3.61
time (sec)	N/A	0.121	0.12	0.059	1.311	1.078	5.36	1.389

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	162	587	944	1328	947	562
normalized size	1	1.	0.78	2.82	4.54	6.38	4.55	2.7
time (sec)	N/A	0.143	0.189	0.064	1.359	1.09	8.015	1.397

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	515	569	524	0	3591	0	0	0
normalized size	1	1.1	1.02	0.	6.97	0.	0.	0.
time (sec)	N/A	0.864	0.481	1.913	2.029	0.	0.	0.

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	422	469	402	0	2633	0	0	0
normalized size	1	1.11	0.95	0.	6.24	0.	0.	0.
time (sec)	N/A	0.741	0.324	1.569	1.954	0.	0.	0.

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	343	397	298	0	1800	0	0	0
normalized size	1	1.16	0.87	0.	5.25	0.	0.	0.
time (sec)	N/A	0.625	0.228	1.52	2.057	0.	0.	0.

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	291	195	0	986	0	0	0
normalized size	1	1.38	0.92	0.	4.67	0.	0.	0.
time (sec)	N/A	0.504	0.174	1.257	1.675	0.	0.	0.

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	132	740	257	0	0	0	0	0
normalized size	1	5.61	1.95	0.	0.	0.	0.	0.
time (sec)	N/A	4.08	0.33	1.391	0.	0.	0.	0.

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	157	480	322	452	774	416	450	505
normalized size	1	3.06	2.05	2.88	4.93	2.65	2.87	3.22
time (sec)	N/A	0.924	0.475	0.069	1.519	1.05	3.734	1.439

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	299	578	452	664	1351	846	877	0
normalized size	1	1.93	1.51	2.22	4.52	2.83	2.93	0.
time (sec)	N/A	1.081	0.484	0.07	1.557	1.09	6.775	0.

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	407	692	598	947	2128	1474	1561	0
normalized size	1	1.7	1.47	2.33	5.23	3.62	3.84	0.
time (sec)	N/A	1.228	0.721	0.075	1.881	1.128	35.508	0.

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	C	C	B	B	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	501	758	762	1285	3075	2229	0	1172
normalized size	1	1.51	1.52	2.56	6.14	4.45	0.	2.34
time (sec)	N/A	1.429	0.988	0.078	2.398	1.191	0.	1.689

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.202	0.157	1.127	0.	0.	0.	0.

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.101	0.115	0.962	0.	0.	0.	0.

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.073	0.07	1.298	0.	0.	0.	0.

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.087	0.077	1.228	0.	0.	0.	0.

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	151	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.074	0.081	1.371	0.	0.	0.	0.

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.212	0.46	1.	0.	0.	0.	0.

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	34	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.11	0.342	1.026	0.	0.	0.	0.

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.082	0.143	1.024	0.	0.	0.	0.

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	147	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.093	0.182	1.406	0.	0.	0.	0.

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	F	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	206	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.085	0.355	1.622	0.	0.	0.	0.

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	F	F	F	F	A	F(-1)	F
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	96	0	0	0	0	149	0	0
normalized size	1	0.	0.	0.	0.	1.55	0.	0.
time (sec)	N/A	0.102	0.059	0.046	0.	1.047	0.	0.

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	355	339	279	14719	801	1283	1528	0
normalized size	1	0.95	0.79	41.46	2.26	3.61	4.3	0.
time (sec)	N/A	0.557	0.586	0.231	1.221	3.517	36.98	0.

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	227	227	215	8605	560	895	1049	0
normalized size	1	1.	0.95	37.91	2.47	3.94	4.62	0.
time (sec)	N/A	0.341	0.262	0.2	1.202	1.837	20.558	0.

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	142	4406	354	581	688	346
normalized size	1	1.	0.95	29.37	2.36	3.87	4.59	2.31
time (sec)	N/A	0.169	0.132	0.184	1.132	1.316	10.691	15.963

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	114	1809	189	321	325	171
normalized size	1	1.	1.05	16.6	1.73	2.94	2.98	1.57
time (sec)	N/A	0.098	0.107	0.174	1.197	1.355	4.786	2.529

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	A	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	52	52	52	418	73	132	83	0
normalized size	1	1.	1.	8.04	1.4	2.54	1.6	0.
time (sec)	N/A	0.027	0.008	0.149	1.168	1.304	1.166	0.

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	140	140	115	1400	0	0	0	0
normalized size	1	1.	0.82	10.	0.	0.	0.	0.
time (sec)	N/A	0.247	0.057	0.545	0.	0.	0.	0.

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	87	113	105	926	186	559	0	378
normalized size	1	1.3	1.21	10.64	2.14	6.43	0.	4.34
time (sec)	N/A	0.106	0.151	0.149	1.121	21.953	0.	1.313

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	169	5274	474	0	0	1110
normalized size	1	1.	0.92	28.82	2.59	0.	0.	6.07
time (sec)	N/A	0.185	0.645	0.175	1.241	0.	0.	1.749

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	275	275	260	18285	1145	0	0	2765
normalized size	1	1.	0.95	66.49	4.16	0.	0.	10.05
time (sec)	N/A	0.396	0.927	0.203	1.538	0.	0.	4.301

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	379	379	355	44893	2372	0	0	5516
normalized size	1	1.	0.94	118.45	6.26	0.	0.	14.55
time (sec)	N/A	0.618	1.159	0.259	1.896	0.	0.	11.725

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	874	994	733	0	2889	0	0	0
normalized size	1	1.14	0.84	0.	3.31	0.	0.	0.
time (sec)	N/A	1.744	0.972	2.677	1.805	0.	0.	0.

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	532	649	486	0	1755	0	0	0
normalized size	1	1.22	0.91	0.	3.3	0.	0.	0.
time (sec)	N/A	1.094	0.531	2.257	1.692	0.	0.	0.

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	444	346	0	909	0	0	0
normalized size	1	1.64	1.28	0.	3.37	0.	0.	0.
time (sec)	N/A	0.82	0.314	1.851	1.585	0.	0.	0.

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	125	246	214	0	0	0	0	0
normalized size	1	1.97	1.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.637	0.164	1.722	0.	0.	0.	0.

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	1998	431	2428	0	0	0	0
normalized size	1	7.21	1.56	8.77	0.	0.	0.	0.
time (sec)	N/A	4.9	0.857	0.336	0.	0.	0.	0.

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	196	612	402	0	0	0	0	0
normalized size	1	3.12	2.05	0.	0.	0.	0.	0.
time (sec)	N/A	1.119	0.959	2.067	0.	0.	0.	0.

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	369	883	595	0	0	0	0	0
normalized size	1	2.39	1.61	0.	0.	0.	0.	0.
time (sec)	N/A	1.481	2.067	2.909	0.	0.	0.	0.

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	714	1356	894	0	0	0	0	0
normalized size	1	1.9	1.25	0.	0.	0.	0.	0.
time (sec)	N/A	2.381	4.224	4.183	0.	0.	0.	0.

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1159	1881	1448	0	0	0	0	0
normalized size	1	1.62	1.25	0.	0.	0.	0.	0.
time (sec)	N/A	3.403	7.311	6.561	0.	0.	0.	0.

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	34	30	46	43	77	20	39
normalized size	1	0.97	0.86	1.31	1.23	2.2	0.57	1.11
time (sec)	N/A	0.014	0.005	0.131	1.129	0.948	0.141	1.265

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.168	0.421	1.279	0.	0.	0.	0.

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.09	0.245	1.067	0.	0.	0.	0.

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.014	0.023	1.074	0.	0.	0.	0.

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.065	0.906	1.409	0.	0.	0.	0.

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.065	0.883	1.366	0.	0.	0.	0.

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.061	8.468	1.424	0.	0.	0.	0.

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.184	1.312	1.112	0.	0.	0.	0.

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.1	0.882	1.115	0.	0.	0.	0.

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.014	0.479	1.079	0.	0.	0.	0.

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.07	2.505	1.425	0.	0.	0.	0.

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.075	4.414	1.58	0.	0.	0.	0.

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.07	30.119	1.841	0.	0.	0.	0.

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	357	341	282	2438	1154	1328	1562	0
normalized size	1	0.96	0.79	6.83	3.23	3.72	4.38	0.
time (sec)	N/A	0.501	0.587	0.318	1.429	3.491	35.794	0.

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	217	1783	841	938	1052	603
normalized size	1	1.	0.95	7.79	3.67	4.1	4.59	2.63
time (sec)	N/A	0.324	0.257	0.266	1.343	1.915	18.946	137.852

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	142	1188	566	621	719	377
normalized size	1	1.	0.93	7.82	3.72	4.09	4.73	2.48
time (sec)	N/A	0.161	0.131	0.237	1.322	1.333	10.373	14.604

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	104	118	656	332	373	321	196
normalized size	1	1.	1.13	6.31	3.19	3.59	3.09	1.88
time (sec)	N/A	0.087	0.105	0.244	1.164	1.045	4.261	2.105

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	B	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	54	54	54	233	77	184	104	0
normalized size	1	1.	1.	4.31	1.43	3.41	1.93	0.
time (sec)	N/A	0.027	0.023	0.224	1.23	1.019	1.145	0.

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	119	1143	0	0	0	0
normalized size	1	1.	0.83	7.94	0.	0.	0.	0.
time (sec)	N/A	0.309	0.059	0.445	0.	0.	0.	0.

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	B	F(-1)	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	117	108	388	259	613	0	0
normalized size	1	1.3	1.2	4.31	2.88	6.81	0.	0.
time (sec)	N/A	0.092	0.164	0.09	1.178	22.296	0.	0.

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	175	175	172	1554	547	0	0	1148
normalized size	1	1.	0.98	8.88	3.13	0.	0.	6.56
time (sec)	N/A	0.17	0.656	0.174	1.315	0.	0.	1.839

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	277	277	263	4421	1215	0	0	2788
normalized size	1	1.	0.95	15.96	4.39	0.	0.	10.06
time (sec)	N/A	0.327	0.892	0.277	1.537	0.	0.	3.95

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F(-1)	F(-1)	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	381	381	358	10401	2442	0	0	0
normalized size	1	1.	0.94	27.3	6.41	0.	0.	0.
time (sec)	N/A	0.553	1.135	0.438	1.927	0.	0.	0.

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	869	973	746	0	3174	0	0	0
normalized size	1	1.12	0.86	0.	3.65	0.	0.	0.
time (sec)	N/A	1.808	0.967	1.77	1.95	0.	0.	0.

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	542	659	497	0	1968	0	0	0
normalized size	1	1.22	0.92	0.	3.63	0.	0.	0.
time (sec)	N/A	1.199	0.532	1.569	1.843	0.	0.	0.

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	450	351	0	1061	0	0	0
normalized size	1	1.6	1.25	0.	3.78	0.	0.	0.
time (sec)	N/A	0.959	0.306	1.416	1.597	0.	0.	0.

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	252	220	0	0	0	0	0
normalized size	1	1.95	1.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.774	0.163	1.319	0.	0.	0.	0.

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	285	2126	0	0	0	0	0	0
normalized size	1	7.46	0.	0.	0.	0.	0.	0.
time (sec)	N/A	5.846	2.2	1.629	0.	0.	0.	0.

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	620	409	0	0	0	0	0
normalized size	1	3.1	2.04	0.	0.	0.	0.	0.
time (sec)	N/A	1.301	0.853	1.794	0.	0.	0.	0.

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	381	899	603	0	0	0	0	0
normalized size	1	2.36	1.58	0.	0.	0.	0.	0.
time (sec)	N/A	1.644	1.962	2.223	0.	0.	0.	0.

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	724	1369	909	0	0	0	0	0
normalized size	1	1.89	1.26	0.	0.	0.	0.	0.
time (sec)	N/A	2.54	4.111	2.948	0.	0.	0.	0.

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	1154	1854	1453	0	0	0	0	0
normalized size	1	1.61	1.26	0.	0.	0.	0.	0.
time (sec)	N/A	3.543	7.253	4.122	0.	0.	0.	0.

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.174	0.176	1.148	0.	0.	0.	0.

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.092	0.126	0.936	0.	0.	0.	0.

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.014	0.035	0.885	0.	0.	0.	0.

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	0.082	1.248	0.	0.	0.	0.

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.068	0.085	1.284	0.	0.	0.	0.

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.062	0.089	1.363	0.	0.	0.	0.

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.191	0.695	1.006	0.	0.	0.	0.

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.103	0.41	1.032	0.	0.	0.	0.

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.014	0.214	1.013	0.	0.	0.	0.

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.072	0.486	1.44	0.	0.	0.	0.

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.076	0.607	1.641	0.	0.	0.	0.

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.071	0.628	2.162	0.	0.	0.	0.

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	365	377	463	2576	906	1623	0	0
normalized size	1	1.03	1.27	7.06	2.48	4.45	0.	0.
time (sec)	N/A	0.712	0.952	0.689	1.402	1.127	0.	0.

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	236	248	314	1967	630	1149	0	0
normalized size	1	1.05	1.33	8.33	2.67	4.87	0.	0.
time (sec)	N/A	0.456	0.567	0.613	1.204	1.103	0.	0.

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	158	170	204	1389	397	753	0	402
normalized size	1	1.08	1.29	8.79	2.51	4.77	0.	2.54
time (sec)	N/A	0.24	0.337	0.576	1.192	1.09	0.	77.419

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	128	124	839	208	413	0	201
normalized size	1	1.1	1.07	7.23	1.79	3.56	0.	1.73
time (sec)	N/A	0.149	0.168	0.541	1.164	1.011	0.	5.784

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	57	123	80	146	0	74
normalized size	1	1.	1.	2.16	1.4	2.56	0.	1.3
time (sec)	N/A	0.03	0.011	0.058	1.127	1.031	0.	1.326

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	156	150	597	0	0	0	0
normalized size	1	1.05	1.01	4.03	0.	0.	0.	0.
time (sec)	N/A	0.189	0.095	0.783	0.	0.	0.	0.

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	132	117	1796	204	551	0	224
normalized size	1	1.1	0.98	14.97	1.7	4.59	0.	1.87
time (sec)	N/A	0.12	0.225	0.486	1.181	18.528	0.	1.471

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	203	178	4925	516	0	0	1197
normalized size	1	1.06	0.93	25.79	2.7	0.	0.	6.27
time (sec)	N/A	0.301	0.734	0.69	2.427	0.	0.	1.88

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	284	296	273	9645	1242	0	0	2041
normalized size	1	1.04	0.96	33.96	4.37	0.	0.	7.19
time (sec)	N/A	0.536	1.343	0.925	1.636	0.	0.	4.524

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	389	401	366	16077	2581	0	0	5925
normalized size	1	1.03	0.94	41.33	6.63	0.	0.	15.23
time (sec)	N/A	0.821	1.471	1.286	2.131	0.	0.	14.597

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	570	697	906	22955	2256	0	0	0
normalized size	1	1.22	1.59	40.27	3.96	0.	0.	0.
time (sec)	N/A	1.294	1.806	3.399	3.83	0.	0.	0.

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	294	449	472	11007	1219	0	0	0
normalized size	1	1.53	1.61	37.44	4.15	0.	0.	0.
time (sec)	N/A	0.955	0.985	2.088	3.618	0.	0.	0.

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	195	217	4749	0	0	0	0
normalized size	1	1.42	1.58	34.66	0.	0.	0.	0.
time (sec)	N/A	0.321	0.147	1.311	0.	0.	0.	0.

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	301	473	1082	0	0	0	0	0
normalized size	1	1.57	3.59	0.	0.	0.	0.	0.
time (sec)	N/A	0.815	0.463	2.559	0.	0.	0.	0.

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	343	3460	0	0	0	0	0
normalized size	1	1.65	16.63	0.	0.	0.	0.	0.
time (sec)	N/A	0.407	2.283	2.712	0.	0.	0.	0.

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	B	F	F	F	F(-1)	F(-2)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	393	968	15422	0	0	0	0	0
normalized size	1	2.46	39.24	0.	0.	0.	0.	0.
time (sec)	N/A	1.631	6.468	1.788	0.	0.	0.	0.

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	875	1640	0	0	0	0	0	0
normalized size	1	1.87	0.	0.	0.	0.	0.	0.
time (sec)	N/A	3.481	5.68	5.47	0.	0.	0.	0.

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	466	1030	0	0	0	0	0	0
normalized size	1	2.21	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.112	3.036	5.28	0.	0.	0.	0.

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	408	378	0	0	0	0	0
normalized size	1	2.01	1.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.59	0.28	2.737	0.	0.	0.	0.

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	425	921	0	0	0	0	0	0
normalized size	1	2.17	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.642	1.452	3.127	0.	0.	0.	0.

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	302	650	0	0	0	0	0	0
normalized size	1	2.15	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.807	3.627	2.753	0.	0.	0.	0.

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	B	F	F	F	F	F(-1)	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	629	2207	0	0	0	0	0	0
normalized size	1	3.51	0.	0.	0.	0.	0.	0.
time (sec)	N/A	3.745	8.247	3.369	0.	0.	0.	0.

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [186] had the largest ratio of [0.75]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	4	3	1.	33	0.091
2	A	4	3	1.	33	0.091
3	A	4	3	1.	33	0.091
4	A	4	3	1.	31	0.097
5	A	9	8	1.5	33	0.242
6	A	4	3	1.61	33	0.091
7	A	4	3	1.	33	0.091
8	A	4	3	1.	33	0.091
9	A	4	3	1.	33	0.091
10	A	27	13	1.52	35	0.371
11	A	23	13	1.53	35	0.371
12	A	19	13	1.53	35	0.371
13	A	15	12	1.58	33	0.364
14	B	45	23	5.72	35	0.657
15	C	24	11	3.76	35	0.314
16	C	28	11	2.17	35	0.314
17	C	32	11	1.64	35	0.314
18	C	36	11	1.34	35	0.314
19	A	0	0	0.	0	0.
20	A	0	0	0.	0	0.
21	A	0	0	0.	0	0.
22	F	0	0	N/A	0	N/A
23	F	0	0	N/A	0	N/A

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
24	A	0	0	0.	0	0.
25	A	0	0	0.	0	0.
26	A	0	0	0.	0	0.
27	F	0	0	N/A	0	N/A
28	F	0	0	N/A	0	N/A
29	A	4	3	1.	33	0.091
30	A	4	3	1.	33	0.091
31	A	4	3	1.	33	0.091
32	A	4	3	1.	31	0.097
33	A	9	8	1.6	33	0.242
34	A	4	3	1.05	33	0.091
35	A	4	3	1.	33	0.091
36	A	4	3	1.	33	0.091
37	A	4	3	1.	33	0.091
38	A	27	13	1.17	35	0.371
39	A	23	13	1.2	35	0.371
40	A	19	13	1.26	35	0.371
41	A	15	12	1.4	33	0.364
42	B	45	23	5.71	35	0.657
43	C	24	11	3.15	35	0.314
44	C	28	11	1.97	35	0.314
45	C	32	11	1.72	35	0.314
46	C	36	11	1.54	35	0.314
47	A	0	0	0.	0	0.
48	A	0	0	0.	0	0.
49	A	0	0	0.	0	0.
50	F	0	0	N/A	0	N/A
51	F	0	0	N/A	0	N/A
52	A	0	0	0.	0	0.
53	A	0	0	0.	0	0.
54	A	0	0	0.	0	0.
55	F	0	0	N/A	0	N/A

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
56	F	0	0	N/A	0	N/A
57	A	4	3	0.96	30	0.1
58	A	4	3	1.	30	0.1
59	A	4	3	1.	30	0.1
60	A	4	3	1.	28	0.107
61	A	3	2	1.	22	0.091
62	A	9	5	1.	30	0.167
63	A	4	3	1.31	30	0.1
64	A	4	3	1.	30	0.1
65	A	4	3	1.	30	0.1
66	A	4	3	1.	30	0.1
67	A	31	13	1.15	32	0.406
68	A	27	13	1.24	32	0.406
69	A	23	12	1.66	30	0.4
70	B	20	10	2.04	24	0.417
71	B	43	21	7.52	32	0.656
72	B	29	10	3.19	32	0.312
73	B	33	11	2.42	32	0.344
74	A	37	11	1.91	32	0.344
75	A	41	11	1.63	32	0.344
76	A	0	0	0.	0	0.
77	A	0	0	0.	0	0.
78	A	0	0	0.	0	0.
79	A	0	0	0.	0	0.
80	A	0	0	0.	0	0.
81	A	0	0	0.	0	0.
82	A	0	0	0.	0	0.
83	A	0	0	0.	0	0.
84	A	0	0	0.	0	0.
85	A	0	0	0.	0	0.
86	A	0	0	0.	0	0.
87	A	0	0	0.	0	0.

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
88	A	4	3	1.	30	0.1
89	A	4	3	1.	30	0.1
90	A	4	3	1.	30	0.1
91	A	4	3	1.	28	0.107
92	A	10	8	1.5	30	0.267
93	A	4	3	1.62	30	0.1
94	A	4	3	1.	30	0.1
95	A	4	3	1.	30	0.1
96	A	4	3	1.	30	0.1
97	A	28	13	1.53	32	0.406
98	A	24	13	1.53	32	0.406
99	A	20	13	1.54	32	0.406
100	A	16	12	1.58	30	0.4
101	B	46	23	5.69	32	0.719
102	C	26	11	3.73	32	0.344
103	C	30	11	2.15	32	0.344
104	C	34	11	1.63	32	0.344
105	C	38	11	1.33	32	0.344
106	A	1	1	1.04	29	0.034
107	A	1	1	1.	18	0.056
108	A	1	1	1.	20	0.05
109	A	0	0	0.	0	0.
110	A	0	0	0.	0	0.
111	A	0	0	0.	0	0.
112	F	0	0	N/A	0	N/A
113	F	0	0	N/A	0	N/A
114	A	0	0	0.	0	0.
115	A	0	0	0.	0	0.
116	A	0	0	0.	0	0.
117	F	0	0	N/A	0	N/A
118	F	0	0	N/A	0	N/A
119	A	4	3	1.	32	0.094

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
120	A	4	3	1.	32	0.094
121	A	4	3	1.	32	0.094
122	A	4	3	1.	30	0.1
123	A	10	8	1.47	32	0.25
124	A	4	3	1.62	32	0.094
125	A	4	3	1.	32	0.094
126	A	4	3	1.	32	0.094
127	A	4	3	1.	32	0.094
128	A	28	13	1.51	34	0.382
129	A	24	13	1.47	34	0.382
130	A	20	13	1.56	34	0.382
131	A	16	12	1.55	32	0.375
132	B	46	23	5.67	34	0.676
133	C	26	11	3.69	34	0.324
134	C	30	11	2.13	34	0.324
135	C	34	11	1.61	34	0.324
136	C	38	11	1.29	34	0.324
137	A	0	0	0.	0	0.
138	A	0	0	0.	0	0.
139	A	0	0	0.	0	0.
140	F	0	0	N/A	0	N/A
141	F	0	0	N/A	0	N/A
142	A	0	0	0.	0	0.
143	A	0	0	0.	0	0.
144	A	0	0	0.	0	0.
145	F	0	0	N/A	0	N/A
146	F	0	0	N/A	0	N/A
147	A	5	3	1.07	31	0.097
148	A	5	3	1.08	31	0.097
149	A	5	3	1.11	31	0.097
150	A	5	3	1.14	29	0.103
151	A	7	6	1.1	31	0.194

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
152	A	4	3	0.74	31	0.097
153	A	5	3	1.09	31	0.097
154	A	5	3	1.07	31	0.097
155	A	5	3	1.06	31	0.097
156	A	21	11	1.68	33	0.333
157	A	18	11	1.62	33	0.333
158	A	15	11	1.58	31	0.355
159	A	10	8	1.73	33	0.242
160	A	7	3	1.47	33	0.091
161	A	12	8	1.5	33	0.242
162	C	26	11	1.71	33	0.333
163	C	29	11	1.44	33	0.333
164	A	56	13	1.49	33	0.394
165	A	40	13	1.49	33	0.394
166	A	27	13	1.86	31	0.419
167	B	14	9	2.28	33	0.273
168	A	11	3	1.96	33	0.091
169	B	21	8	2.08	33	0.242
170	C	66	16	3.07	33	0.485
171	C	93	16	2.62	33	0.485
172	F	0	0	N/A	0	N/A
173	A	4	3	1.	30	0.1
174	A	4	3	1.	30	0.1
175	A	4	3	1.	30	0.1
176	A	4	3	1.	28	0.107
177	A	10	8	1.51	30	0.267
178	A	4	3	1.58	30	0.1
179	A	4	3	1.	30	0.1
180	A	4	3	1.	30	0.1
181	A	4	3	1.	30	0.1
182	A	28	13	1.11	32	0.406
183	A	24	13	1.13	32	0.406

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
184	A	20	13	1.16	32	0.406
185	A	16	12	1.41	30	0.4
186	B	47	24	5.62	32	0.75
187	C	26	11	3.07	32	0.344
188	C	30	11	1.95	32	0.344
189	C	34	11	1.7	32	0.344
190	C	38	11	1.53	32	0.344
191	A	0	0	0.	0	0.
192	A	0	0	0.	0	0.
193	A	0	0	0.	0	0.
194	F	0	0	N/A	0	N/A
195	F	0	0	N/A	0	N/A
196	A	0	0	0.	0	0.
197	A	0	0	0.	0	0.
198	A	0	0	0.	0	0.
199	F	0	0	N/A	0	N/A
200	F	0	0	N/A	0	N/A
201	A	4	3	1.	32	0.094
202	A	4	3	1.	32	0.094
203	A	4	3	1.	32	0.094
204	A	4	3	1.	30	0.1
205	A	10	8	1.46	32	0.25
206	A	4	3	1.03	32	0.094
207	A	4	3	1.	32	0.094
208	A	4	3	1.	32	0.094
209	A	4	3	1.	32	0.094
210	A	28	13	1.1	34	0.382
211	A	24	13	1.11	34	0.382
212	A	20	13	1.16	34	0.382
213	A	16	12	1.38	32	0.375
214	B	46	23	5.61	34	0.676
215	C	26	11	3.06	34	0.324

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
216	C	30	11	1.93	34	0.324
217	C	34	11	1.7	34	0.324
218	C	38	11	1.51	34	0.324
219	A	0	0	0.	0	0.
220	A	0	0	0.	0	0.
221	A	0	0	0.	0	0.
222	F	0	0	N/A	0	N/A
223	F	0	0	N/A	0	N/A
224	A	0	0	0.	0	0.
225	A	0	0	0.	0	0.
226	A	0	0	0.	0	0.
227	F	0	0	N/A	0	N/A
228	F	0	0	N/A	0	N/A
229	F	0	0	N/A	0	N/A
230	A	4	3	0.95	27	0.111
231	A	4	3	1.	27	0.111
232	A	4	3	1.	27	0.111
233	A	4	3	1.	25	0.12
234	A	3	2	1.	19	0.105
235	A	10	6	1.	27	0.222
236	A	4	3	1.3	27	0.111
237	A	4	3	1.	27	0.111
238	A	4	3	1.	27	0.111
239	A	4	3	1.	27	0.111
240	A	33	13	1.14	29	0.448
241	A	29	13	1.22	29	0.448
242	A	25	12	1.64	27	0.444
243	A	22	10	1.97	21	0.476
244	B	41	21	7.21	29	0.724
245	B	32	10	3.12	29	0.345
246	B	36	11	2.39	29	0.379
247	A	40	11	1.9	29	0.379

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
248	A	44	11	1.62	29	0.379
249	A	4	4	0.97	14	0.286
250	A	0	0	0.	0	0.
251	A	0	0	0.	0	0.
252	A	0	0	0.	0	0.
253	A	0	0	0.	0	0.
254	A	0	0	0.	0	0.
255	A	0	0	0.	0	0.
256	A	0	0	0.	0	0.
257	A	0	0	0.	0	0.
258	A	0	0	0.	0	0.
259	A	0	0	0.	0	0.
260	A	0	0	0.	0	0.
261	A	0	0	0.	0	0.
262	A	4	3	0.96	29	0.103
263	A	4	3	1.	29	0.103
264	A	4	3	1.	29	0.103
265	A	4	3	1.	27	0.111
266	A	3	2	1.	21	0.095
267	A	10	6	1.	29	0.207
268	A	4	3	1.3	29	0.103
269	A	4	3	1.	29	0.103
270	A	4	3	1.	29	0.103
271	A	4	3	1.	29	0.103
272	A	33	13	1.12	31	0.419
273	A	29	13	1.22	31	0.419
274	A	25	12	1.6	29	0.414
275	A	22	10	1.95	23	0.435
276	B	44	21	7.46	31	0.677
277	B	32	10	3.1	31	0.323
278	B	36	11	2.36	31	0.355
279	A	40	11	1.89	31	0.355

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
280	A	44	11	1.61	31	0.355
281	A	0	0	0.	0	0.
282	A	0	0	0.	0	0.
283	A	0	0	0.	0	0.
284	A	0	0	0.	0	0.
285	A	0	0	0.	0	0.
286	A	0	0	0.	0	0.
287	A	0	0	0.	0	0.
288	A	0	0	0.	0	0.
289	A	0	0	0.	0	0.
290	A	0	0	0.	0	0.
291	A	0	0	0.	0	0.
292	A	0	0	0.	0	0.
293	A	5	3	1.03	31	0.097
294	A	5	3	1.05	31	0.097
295	A	5	3	1.08	31	0.097
296	A	5	3	1.1	29	0.103
297	A	3	2	1.	23	0.087
298	A	9	5	1.05	31	0.161
299	A	6	4	1.1	31	0.129
300	A	5	3	1.06	31	0.097
301	A	5	3	1.04	31	0.097
302	A	5	3	1.03	31	0.097
303	A	23	11	1.22	33	0.333
304	A	20	11	1.53	31	0.355
305	A	10	8	1.42	25	0.32
306	A	16	10	1.57	33	0.303
307	A	10	7	1.65	33	0.212
308	B	29	16	2.46	33	0.485
309	A	53	13	1.87	33	0.394
310	B	35	13	2.21	31	0.419
311	B	14	10	2.01	25	0.4

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
312	B	25	11	2.17	33	0.333
313	B	14	9	2.15	33	0.273
314	B	49	21	3.51	33	0.636

Chapter 3

Listing of integrals

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

Optimal. Leaf size=188

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

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

Rubi [A] time = 0.1431, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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



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

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

Rule 2525

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

Rule 12

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

Rule 43

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

Rubi steps

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

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

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

$$= \frac{B(bc-ad)^4g^4nx}{5d^4} - \frac{B(bc-ad)^3g^4n(a+bx)^2}{10bd^3} + \frac{B(bc-ad)^2g^4n(a+bx)^3}{15bd^2} -$$

Mathematica [A] time = 0.128648, size = 146, normalized size = 0.78

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.546, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.28014, size = 913, normalized size = 4.86

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Fricas [B] time = 1.1829, size = 1188, normalized size = 6.32

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Optimal. Leaf size=156

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

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

Rubi [A] time = 0.105831, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 43

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

Rubi steps

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

Mathematica [A] time = 0.110189, size = 124, normalized size = 0.79

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.405, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.2364, size = 647, normalized size = 4.15

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.06987, size = 883, normalized size = 5.66

$$6 Ab^{4}d^{4}g^{3}x^{4}+6 Ba^{4}d^{4}g^{3}n \log\left(bx+a\right)+6 \left(Bb^{4}c^{4}-4 Bab^{3}c^{3}d+6 Ba^{2}b^{2}c^{2}d^{2}-4 Ba^{3}bcd^{3}\right)g^{3}n \log\left(dx+c\right)+2 \left(12 Aab^{3}d\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Optimal. Leaf size=124

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

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

Rubi [A] time = 0.089504, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 43

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

Rubi steps

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

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

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

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

Mathematica [A] time = 0.0621068, size = 103, normalized size = 0.83

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.402, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.21147, size = 417, normalized size = 3.36

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 0.906362, size = 622, normalized size = 5.02

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 26.7209, size = 354, normalized size = 2.85

$$\frac{Ba^3g^2n\log(bx+a)}{3b} + \frac{1}{3}\left(Ab^2g^2 + Bb^2g^2\right)x^3 - \frac{\left(Bb^2cg^2n - Babdg^2n - 6\,Aabdg^2 - 6\,Babdg^2\right)x^2}{6\,d} + \frac{1}{3}\left(Bb^2g^2nx^3 + 3\,Babg\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=86

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

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

Rubi [A] time = 0.0614864, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 43

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

Rubi steps

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

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

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

$$= -\frac{B(bc-ad)gnx}{2d} + \frac{g(a+bx)^2\left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2b} + \frac{B(bc-ad)^2 gn\,\mathrm{lo}}{2bd^2}$$

Mathematica [A] time = 0.0395174, size = 73, normalized size = 0.85

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.322, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.13311, size = 211, normalized size = 2.45

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.948587, size = 360, normalized size = 4.19

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [A] time = 3.65069, size = 167, normalized size = 1.94

$$\frac{Ba^2gn\log{(bx+a)}}{2\,b}+\frac{1}{2}\left(Abg+Bbg\right)x^2+\frac{1}{2}\left(Bbgnx^2+2\,Bagnx\right)\log\left(\frac{bx+a}{dx+c}\right)-\frac{\left(Bbcgn-Badgn-2\,Aadg-2\,Badg\right)x}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=84

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

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

Rubi [A] time = 0.209336, antiderivative size = 126, normalized size of antiderivative = 1.5, number of steps used = 9, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2524, 2418, 2390, 12, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

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

Rule 2524

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

Rule 2418

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

RFx, x] && IntegerQ[p]

Rule 2390

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

Rule 12

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

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

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

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

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

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

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

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

Mathematica [A] time = 0.0535529, size = 101, normalized size = 1.2

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.529, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=67

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

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

Rubi [A] time = 0.0904321, antiderivative size = 108, normalized size of antiderivative = 1.61, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 44

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

Rubi steps

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

Mathematica [A] time = 0.0633145, size = 115, normalized size = 1.72

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.449, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.21445, size = 185, normalized size = 2.76

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.796695, size = 221, normalized size = 3.3

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [A] time = 1.42295, size = 162, normalized size = 2.42

$$-\frac{Bdn\log(bx+a)}{b^2cg^2-abdg^2}+\frac{Bdn\log(dx+c)}{b^2cg^2-abdg^2}-\frac{Bn\log\left(\frac{bx+a}{dx+c}\right)}{b^2g^2x+abg^2}-\frac{Bn+A+B}{b^2g^2x+abg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=151

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

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

Rubi [A] time = 0.122887, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 44

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

Rubi steps

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

Mathematica [A] time = 0.162042, size = 114, normalized size = 0.75

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.436, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.21237, size = 350, normalized size = 2.32

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.991217, size = 562, normalized size = 3.72

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [A] time = 1.57075, size = 351, normalized size = 2.32

$$\frac{Bd^2n\log(bx+a)}{2\left(b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3\right)}-\frac{Bd^2n\log(dx+c)}{2\left(b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3\right)}-\frac{Bn\log\left(\frac{bx+a}{dx+c}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}+\frac{2\,Bbdnx-}{4\left(b^4cg^3x^2-ab\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=183

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^2n}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd^3n\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bdn}{6bg^4(a+bx)^2(bc-ad)}-\frac{}{9}$$

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

Rubi [A] time = 0.151906, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^2n}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd^3n\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bdn}{6bg^4(a+bx)^2(bc-ad)}-\frac{}{9}$$

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 44

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

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(ag+bgx)^4}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bg^4(a+bx)^3}+\frac{(Bn)\int \frac{bc-ad}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}\\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bg^4(a+bx)^3}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}\\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3bg^4(a+bx)^3}+\frac{(B(bc-ad)n)\int \left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)^2}-\right.}{3bg^4}\\ &= -\frac{Bn}{9bg^4(a+bx)^3}+\frac{Bdn}{6b(bc-ad)g^4(a+bx)^2}-\frac{Bd^2n}{3b(bc-ad)^2g^4(a+bx)}-\frac{Bd^3n\log(a+bx)}{3b(bc-ad)^3g^4}-\end{aligned}$$

Mathematica [A] time = 0.184807, size = 145, normalized size = 0.79

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

Antiderivative was successfully verified.

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

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

```
g^4*(a + b*x)^3)
```

Maple [F] time = 0.437, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.26343, size = 583, normalized size = 3.19

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 0.879277, size = 990, normalized size = 5.41

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.36737, size = 655, normalized size = 3.58

$$-\frac{Bd^3n\log\left(bx+a\right)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}+\frac{Bd^3n\log\left(dx+c\right)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{B}{3\left(b^4g^4x^3+3\,ab\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
2*d*g^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*n*log((b*x + a)/(d*x
 + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/18
*(6*B*b^2*d^2*n*x^2 - 3*B*b^2*c*d*n*x + 15*B*a*b*d^2*n*x + 2*B*b^2*c^2*n -
7*B*a*b*c*d*n + 11*B*a^2*d^2*n + 6*A*b^2*c^2 + 6*B*b^2*c^2 - 12*A*a*b*c*d -
 12*B*a*b*c*d + 6*A*a^2*d^2 + 6*B*a^2*d^2)/(b^6*c^2*g^4*x^3 - 2*a*b^5*c*d*g
^4*x^3 + a^2*b^4*d^2*g^4*x^3 + 3*a*b^5*c^2*g^4*x^2 - 6*a^2*b^4*c*d*g^4*x^2
+ 3*a^3*b^3*d^2*g^4*x^2 + 3*a^2*b^4*c^2*g^4*x - 6*a^3*b^3*c*d*g^4*x + 3*a^4
*b^2*d^2*g^4*x + a^3*b^3*c^2*g^4 - 2*a^4*b^2*c*d*g^4 + a^5*b*d^2*g^4)
```

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

Optimal. Leaf size=215

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3n}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4n\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{}{12}$$

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

Rubi [A] time = 0.189061, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3n}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4n\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{}{12}$$

Antiderivative was successfully verified.

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

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

Rule 2525

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

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

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

Rule 44

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

Rubi steps

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

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^5(c+dx)}\,dx}{4bg^5}$$

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

$$= -\frac{Bn}{16bg^5(a+bx)^4}+\frac{Bdn}{12b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2n}{8b(bc-ad)^2g^5(a+bx)^2}+\frac{Bd^3n}{4b(bc-ad)^3g^5}$$

Mathematica [A] time = 0.259689, size = 162, normalized size = 0.75

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.437, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{5}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.34799, size = 879, normalized size = 4.09

$$\frac{1}{48}Bn\left(\frac{12\,b^{3}d^{3}x^{3}-3\,b^{3}c^{3}+13\,ab^{2}c^{2}d-23\,a^{2}bcd^{2}+25\,a^{3}}{\left(b^{8}c^{3}-3\,ab^{7}c^{2}d+3\,a^{2}b^{6}cd^{2}-a^{3}b^{5}d^{3}\right)g^{5}x^{4}+4\left(ab^{7}c^{3}-3\,a^{2}b^{6}c^{2}d+3\,a^{3}b^{5}cd^{2}-a^{4}b^{4}d^{3}\right)g^{5}x^{3}+6\left(a^{2}b^{6}c^{3}-3\,a^{3}b^{5}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 1.06627, size = 1505, normalized size = 7.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.42214, size = 1038, normalized size = 4.83

$$\frac{Bd^4n\log(bx+a)}{4\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+a^4bd^4g^5\right)}-\frac{Bd^4n\log(dx+c)}{4\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*B*d^4*n*log(b*x + a)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d
^2*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) - 1/4*B*d^4*n*log(d*x + c)/(b
^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^
5 + a^4*b*d^4*g^5) - 1/4*B*n*log((b*x + a)/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^
4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 1/48*(12*B*b
^3*d^3*n*x^3 - 6*B*b^3*c*d^2*n*x^2 + 42*B*a*b^2*d^3*n*x^2 + 4*B*b^3*c^2*d*n
*x - 20*B*a*b^2*c*d^2*n*x + 52*B*a^2*b*d^3*n*x - 3*B*b^3*c^3*n + 13*B*a*b^2
*c^2*d*n - 23*B*a^2*b*c*d^2*n + 25*B*a^3*d^3*n - 12*A*b^3*c^3 - 12*B*b^3*c^
3 + 36*A*a*b^2*c^2*d + 36*B*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 36*B*a^2*b*c*d
^2 + 12*A*a^3*d^3 + 12*B*a^3*d^3)/(b^8*c^3*g^5*x^4 - 3*a*b^7*c^2*d*g^5*x^4
+ 3*a^2*b^6*c*d^2*g^5*x^4 - a^3*b^5*d^3*g^5*x^4 + 4*a*b^7*c^3*g^5*x^3 - 12*
a^2*b^6*c^2*d*g^5*x^3 + 12*a^3*b^5*c*d^2*g^5*x^3 - 4*a^4*b^4*d^3*g^5*x^3 +
6*a^2*b^6*c^3*g^5*x^2 - 18*a^3*b^5*c^2*d*g^5*x^2 + 18*a^4*b^4*c*d^2*g^5*x^2
 - 6*a^5*b^3*d^3*g^5*x^2 + 4*a^3*b^5*c^3*g^5*x - 12*a^4*b^4*c^2*d*g^5*x + 1
2*a^5*b^3*c*d^2*g^5*x - 4*a^6*b^2*d^3*g^5*x + a^4*b^4*c^3*g^5 - 3*a^5*b^3*c
^2*d*g^5 + 3*a^6*b^2*c*d^2*g^5 - a^7*b*d^3*g^5)
```

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

Optimal. Leaf size=396

$$\frac{2B^2g^4n^2(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{5bd^5}+\frac{Bg^4n(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(12B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+12A+25Bn\right)}{30bd^5}+\frac{Bg^4n(a+$$

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

Rubi [A] time = 0.87062, antiderivative size = 602, normalized size of antiderivative = 1.52, number of steps used = 27, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

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

Antiderivative was successfully verified.

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

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

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

Rule 2525

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

Rule 12

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

Rule 2528

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

Rule 2486

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

Rule 31

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

Rule 43

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

Rule 2524

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

Rule 2418

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rule 2390

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

Rule 2301

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

Rubi steps

$$\int (ag+bgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5b} - \frac{(2Bn)\int \frac{(bc-ad)g^5(a+bx)^4\left(A+B\log\left(e\left(\frac{a\cdot}{c\cdot}\right.\right.\right.}{c+dx}}{5bg}$$

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

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

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

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

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

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

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30d^4} - \frac{7B^2(bc-ad)^3g^4n^2(a+bx)}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30d^4} - \frac{7B^2(bc-ad)^3g^4n^2(a+bx)}{60bd^3}$$

$$= \frac{2AB(bc-ad)^4g^4nx}{5d^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30d^4} - \frac{7B^2(bc-ad)^3g^4n^2(a+bx)}{60bd^3}$$

Mathematica [A] time = 0.524705, size = 535, normalized size = 1.35

$$g^4\left(\frac{Bn(bc-ad)\left(12Bn(bc-ad)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-12d^2(a+bx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)+8d^3(a+bx)^3(bc-ad)\left(\right.}{}\right.$$

Antiderivative was successfully verified.

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

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)
*n*(24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[e*((a + b*x
)/(c + d*x))^n]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]) - 6*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2
4*B*(b*c - a*d)^4*n*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])*Log[c + d*x] + 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x - d
^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*n*(6*b*d*(b*
c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*
c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*n*(b*d*x + (-(b*c) + a*d)*Log
[c + d*x]) + 12*B*(b*c - a*d)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12*
d^5)))/(5*b)
```

Maple [F] time = 0.427, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 3.82424, size = 3976, normalized size = 10.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/5*A*B*b^4*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*b^4*g^
4*x^5 + 2*A*B*a*b^3*g^4*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*a*
b^3*g^4*x^4 + 4*A*B*a^2*b^2*g^4*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
+ 2*A^2*a^2*b^2*g^4*x^3 + 4*A*B*a^3*b*g^4*x^2*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + 2*A^2*a^3*b*g^4*x^2 + 1/30*A*B*b^4*g^4*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/3*A*B*a*b^3*g^4*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 2*A*B*a^2*b^2*g^4*n*(2*a^3*log
(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*
c^2 - a^2*d^2)*x)/(b^2*d^2)) - 4*A*B*a^3*b*g^4*n*(a^2*log(b*x + a)/b^2 - c^
2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^4*g^4*n*(a*log(b*x + a)
/b - c*log(d*x + c)/d) + 2*A*B*a^4*g^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n) + A^2*a^4*g^4*x - 1/30*((25*g^4*n^2 + 12*g^4*n*log(e))*b^4*c^5 - (113*
g^4*n^2 + 60*g^4*n*log(e))*a*b^3*c^4*d + 4*(49*g^4*n^2 + 30*g^4*n*log(e))*a
^2*b^2*c^3*d^2 - 12*(13*g^4*n^2 + 10*g^4*n*log(e))*a^3*b*c^2*d^3 + 12*(4*g^
4*n^2 + 5*g^4*n*log(e))*a^4*c*d^4)*B^2*log(d*x + c)/d^5 - 2/5*(b^5*c^5*g^4*
n^2 - 5*a*b^4*c^4*d*g^4*n^2 + 10*a^2*b^3*c^3*d^2*g^4*n^2 - 10*a^3*b^2*c^2*d
^3*g^4*n^2 + 5*a^4*b*c*d^4*g^4*n^2 - a^5*d^5*g^4*n^2)*(log(b*x + a)*log((b*
d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^5
) + 1/60*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 - 12*B^2*a^5*d^5*g^4*n^2*log(b*x
+ a)^2 - 6*(b^5*c*d^4*g^4*n*log(e) - (g^4*n*log(e) + 10*g^4*log(e)^2)*a*b^4
*d^5)*B^2*x^4 + 2*((g^4*n^2 + 4*g^4*n*log(e))*b^5*c^2*d^3 - 2*(g^4*n^2 + 10
*g^4*n*log(e))*a*b^4*c*d^4 + (g^4*n^2 + 16*g^4*n*log(e) + 60*g^4*log(e)^2)*
a^2*b^3*d^5)*B^2*x^3 - ((7*g^4*n^2 + 12*g^4*n*log(e))*b^5*c^3*d^2 - 3*(9*g^
4*n^2 + 20*g^4*n*log(e))*a*b^4*c^2*d^3 + 3*(11*g^4*n^2 + 40*g^4*n*log(e))*a
^2*b^3*c*d^4 - (13*g^4*n^2 + 72*g^4*n*log(e) + 120*g^4*log(e)^2)*a^3*b^2*d^
5)*B^2*x^2 + 24*(b^5*c^5*g^4*n^2 - 5*a*b^4*c^4*d*g^4*n^2 + 10*a^2*b^3*c^3*d
^2*g^4*n^2 - 10*a^3*b^2*c^2*d^3*g^4*n^2 + 5*a^4*b*c*d^4*g^4*n^2)*B^2*log(b*
x + a)*log(d*x + c) - 12*(b^5*c^5*g^4*n^2 - 5*a*b^4*c^4*d*g^4*n^2 + 10*a^2*
b^3*c^3*d^2*g^4*n^2 - 10*a^3*b^2*c^2*d^3*g^4*n^2 + 5*a^4*b*c*d^4*g^4*n^2)*B
^2*log(d*x + c)^2 + 2*((13*g^4*n^2 + 12*g^4*n*log(e))*b^5*c^4*d - (59*g^4*n
^2 + 60*g^4*n*log(e))*a*b^4*c^3*d^2 + 6*(17*g^4*n^2 + 20*g^4*n*log(e))*a^2*
b^3*c^2*d^3 - (79*g^4*n^2 + 120*g^4*n*log(e))*a^3*b^2*c*d^4 + (23*g^4*n^2 +
 48*g^4*n*log(e) + 30*g^4*log(e)^2)*a^4*b*d^5)*B^2*x + 2*(12*a*b^4*c^4*d*g^
4*n^2 - 54*a^2*b^3*c^3*d^2*g^4*n^2 + 94*a^3*b^2*c^2*d^3*g^4*n^2 - 77*a^4*b*
c*d^4*g^4*n^2 + (25*g^4*n^2 + 12*g^4*n*log(e))*a^5*d^5)*B^2*log(b*x + a) +
12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^3*d^5*g^4*
x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x)*log((b*x + a)^n)^
2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^3*d^5*
g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x)*log((d*x + c)
^n)^2 + 2*(12*B^2*b^5*d^5*g^4*x^5*log(e) + 12*B^2*a^5*d^5*g^4*n*log(b*x + a
) - 3*(b^5*c*d^4*g^4*n - (g^4*n + 20*g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 4*(b^
5*c^2*d^3*g^4*n - 5*a*b^4*c*d^4*g^4*n + 2*(2*g^4*n + 15*g^4*log(e))*a^2*b^3
```

```
*d^5)*B^2*x^3 - 6*(b^5*c^3*d^2*g^4*n - 5*a*b^4*c^2*d^3*g^4*n + 10*a^2*b^3*c
*d^4*g^4*n - 2*(3*g^4*n + 10*g^4*log(e))*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^4
*d*g^4*n - 5*a*b^4*c^3*d^2*g^4*n + 10*a^2*b^3*c^2*d^3*g^4*n - 10*a^3*b^2*c*
d^4*g^4*n + (4*g^4*n + 5*g^4*log(e))*a^4*b*d^5)*B^2*x - 12*(b^5*c^5*g^4*n -
 5*a*b^4*c^4*d*g^4*n + 10*a^2*b^3*c^3*d^2*g^4*n - 10*a^3*b^2*c^2*d^3*g^4*n
+ 5*a^4*b*c*d^4*g^4*n)*B^2*log(d*x + c))*log((b*x + a)^n) - 2*(12*B^2*b^5*d
^5*g^4*x^5*log(e) + 12*B^2*a^5*d^5*g^4*n*log(b*x + a) - 3*(b^5*c*d^4*g^4*n
- (g^4*n + 20*g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 4*(b^5*c^2*d^3*g^4*n - 5*a*b
^4*c*d^4*g^4*n + 2*(2*g^4*n + 15*g^4*log(e))*a^2*b^3*d^5)*B^2*x^3 - 6*(b^5*
c^3*d^2*g^4*n - 5*a*b^4*c^2*d^3*g^4*n + 10*a^2*b^3*c*d^4*g^4*n - 2*(3*g^4*n
 + 10*g^4*log(e))*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^4*d*g^4*n - 5*a*b^4*c^3*
d^2*g^4*n + 10*a^2*b^3*c^2*d^3*g^4*n - 10*a^3*b^2*c*d^4*g^4*n + (4*g^4*n +
5*g^4*log(e))*a^4*b*d^5)*B^2*x - 12*(b^5*c^5*g^4*n - 5*a*b^4*c^4*d*g^4*n +
10*a^2*b^3*c^3*d^2*g^4*n - 10*a^3*b^2*c^2*d^3*g^4*n + 5*a^4*b*c*d^4*g^4*n)*
B^2*log(d*x + c) + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B
^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x
)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^5)
```

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

$$\text{integral}\left(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \left(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2a^2b^2g^4x^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

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

3.11 $\int (ag+bgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=335

$$-\frac{B^2g^3n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{2bd^4}-\frac{Bg^3n(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+6A+11Bn\right)}{12bd^4}-\frac{Bg^3n(a+b}{}$$

```
[Out] -(B*(b*c - a*d)*g^3*n*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
6*b*d) + (g^3*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b) +
 (B*(b*c - a*d)^2*g^3*n*(a + b*x)^2*(3*A + B*n + 3*B*Log[e*((a + b*x)/(c +
d*x))^n]))/(12*b*d^2) - (B*(b*c - a*d)^3*g^3*n*(a + b*x)*(6*A + 5*B*n + 6*B
*Log[e*((a + b*x)/(c + d*x))^n]))/(12*b*d^3) - (B*(b*c - a*d)^4*g^3*n*(6*A
+ 11*B*n + 6*B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x)
)])/(12*b*d^4) - (B^2*(b*c - a*d)^4*g^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))])/(2*b*d^4)
```

Rubi [A] time = 0.706999, antiderivative size = 512, normalized size of antiderivative = 1.53, number of steps used = 23, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 2528

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

Rule 2486

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

Rule 31

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

Rule 43

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

Rule 2524

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

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

Rule 2418

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rule 2390

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

Rule 2301

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

Rubi steps

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

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

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

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

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

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

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

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} - \frac{5B^2(bc-ad)^3g^3n^2x}{12d^3} + \frac{B^2(bc-ad)^2g^3n^2(a+bx)^2}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} - \frac{5B^2(bc-ad)^3g^3n^2x}{12d^3} + \frac{B^2(bc-ad)^2g^3n^2(a+bx)^2}{12bd^2}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2d^3} - \frac{5B^2(bc-ad)^3g^3n^2x}{12d^3} + \frac{B^2(bc-ad)^2g^3n^2(a+bx)^2}{12bd^2}$$

Mathematica [A] time = 0.359561, size = 411, normalized size = 1.23

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.433, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 3.80072, size = 2936, normalized size = 8.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

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

```
log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*a*b^2*g^3*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*a^2*b*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*a^3*g^3*n*(a*log(b*x + a)/b
 - c*log(d*x + c)/d) + 2*A*B*a^3*g^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + A^2*a^3*g^3*x + 1/12*((11*g^3*n^2 + 6*g^3*n*log(e))*b^3*c^4 - 2*(19*g^
3*n^2 + 12*g^3*n*log(e))*a*b^2*c^3*d + 9*(5*g^3*n^2 + 4*g^3*n*log(e))*a^2*b
*c^2*d^2 - 6*(3*g^3*n^2 + 4*g^3*n*log(e))*a^3*c*d^3)*B^2*log(d*x + c)/d^4 +
 1/2*(b^4*c^4*g^3*n^2 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c^2*d^2*g^3*n^2 -
 4*a^3*b*c*d^3*g^3*n^2 + a^4*d^4*g^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(
b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^4) + 1/12*(3*
B^2*b^4*d^4*g^3*x^4*log(e)^2 - 3*B^2*a^4*d^4*g^3*n^2*log(b*x + a)^2 - 2*(b^
4*c*d^3*g^3*n*log(e) - (g^3*n*log(e) + 6*g^3*log(e)^2)*a*b^3*d^4)*B^2*x^3 +
 ((g^3*n^2 + 3*g^3*n*log(e))*b^4*c^2*d^2 - 2*(g^3*n^2 + 6*g^3*n*log(e))*a*b
^3*c*d^3 + (g^3*n^2 + 9*g^3*n*log(e) + 18*g^3*log(e)^2)*a^2*b^2*d^4)*B^2*x^
2 - 6*(b^4*c^4*g^3*n^2 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c^2*d^2*g^3*n^2
- 4*a^3*b*c*d^3*g^3*n^2)*B^2*log(b*x + a)*log(d*x + c) + 3*(b^4*c^4*g^3*n^2
 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c^2*d^2*g^3*n^2 - 4*a^3*b*c*d^3*g^3*n^
2)*B^2*log(d*x + c)^2 - ((5*g^3*n^2 + 6*g^3*n*log(e))*b^4*c^3*d - (17*g^3*n
^2 + 24*g^3*n*log(e))*a*b^3*c^2*d^2 + (19*g^3*n^2 + 36*g^3*n*log(e))*a^2*b^
2*c*d^3 - (7*g^3*n^2 + 18*g^3*n*log(e) + 12*g^3*log(e)^2)*a^3*b*d^4)*B^2*x
- (6*a*b^3*c^3*d*g^3*n^2 - 21*a^2*b^2*c^2*d^2*g^3*n^2 + 26*a^3*b*c*d^3*g^3*
n^2 - (11*g^3*n^2 + 6*g^3*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4*
d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a
^3*b*d^4*g^3*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d
^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x)*log((d*x +
c)^n)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) + 6*B^2*a^4*d^4*g^3*n*log(b*x + a)
- 2*(b^4*c*d^3*g^3*n - (g^3*n + 12*g^3*log(e))*a*b^3*d^4)*B^2*x^3 + 3*(b^4*
c^2*d^2*g^3*n - 4*a*b^3*c*d^3*g^3*n + 3*(g^3*n + 4*g^3*log(e))*a^2*b^2*d^4)
*B^2*x^2 - 6*(b^4*c^3*d*g^3*n - 4*a*b^3*c^2*d^2*g^3*n + 6*a^2*b^2*c*d^3*g^3
*n - (3*g^3*n + 4*g^3*log(e))*a^3*b*d^4)*B^2*x + 6*(b^4*c^4*g^3*n - 4*a*b^3
*c^3*d*g^3*n + 6*a^2*b^2*c^2*d^2*g^3*n - 4*a^3*b*c*d^3*g^3*n)*B^2*log(d*x +
 c))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g^3*x^4*log(e) + 6*B^2*a^4*d^4*g^3*n
*log(b*x + a) - 2*(b^4*c*d^3*g^3*n - (g^3*n + 12*g^3*log(e))*a*b^3*d^4)*B^2
*x^3 + 3*(b^4*c^2*d^2*g^3*n - 4*a*b^3*c*d^3*g^3*n + 3*(g^3*n + 4*g^3*log(e)
)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3*n - 4*a*b^3*c^2*d^2*g^3*n + 6*a^2
*b^2*c*d^3*g^3*n - (3*g^3*n + 4*g^3*log(e))*a^3*b*d^4)*B^2*x + 6*(b^4*c^4*g
^3*n - 4*a*b^3*c^3*d*g^3*n + 6*a^2*b^2*c^2*d^2*g^3*n - 4*a^3*b*c*d^3*g^3*n)
*B^2*log(d*x + c) + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^
2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x)*log((b*x + a)^n))*log((d*x +
 c)^n))/(b*d^4)
```

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

$$\mathrm{integral}\Big(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\Big(e\Big($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

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

3.12 $\int (ag+bgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=274

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

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

Rubi [A] time = 0.582896, antiderivative size = 420, normalized size of antiderivative = 1.53, number of steps used = 19, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

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

Rule 12

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

Rule 2528

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

Rule 2486

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

Rule 31

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

Rule 43

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

Rule 2524

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

Rule 2418

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rule 2390

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

Rule 2301

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

Rubi steps

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

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

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

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

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

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

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

$$= \frac{2AB(bc-ad)^2g^2nx}{3d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2n(a+bx)\,\mathrm{l}}{3bd^2}$$

$$= \frac{2AB(bc-ad)^2g^2nx}{3d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2n(a+bx)\,\mathrm{l}}{3bd^2}$$

$$= \frac{2AB(bc-ad)^2g^2nx}{3d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2n(a+bx)\,\mathrm{l}}{3bd^2}$$

Mathematica [A] time = 0.237362, size = 303, normalized size = 1.11

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.426, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 3.68197, size = 2026, normalized size = 7.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
+ 2*g^2*n*log(e))*b^2*c^3 - (7*g^2*n^2 + 6*g^2*n*log(e))*a*b*c^2*d + 2*(2*g
^2*n^2 + 3*g^2*n*log(e))*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*g^2
*n^2 - 3*a*b^2*c^2*d*g^2*n^2 + 3*a^2*b*c*d^2*g^2*n^2 - a^3*d^3*g^2*n^2)*(lo
g(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c -
 a*d)))*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 - B^2*a^3*d^3*g^2*n
^2*log(b*x + a)^2 - (b^3*c*d^2*g^2*n*log(e) - (g^2*n*log(e) + 3*g^2*log(e)^
2)*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^3*g^2*n^2 - 3*a*b^2*c^2*d*g^2*n^2 + 3*a^2*
b*c*d^2*g^2*n^2)*B^2*log(b*x + a)*log(d*x + c) - (b^3*c^3*g^2*n^2 - 3*a*b^2
*c^2*d*g^2*n^2 + 3*a^2*b*c*d^2*g^2*n^2)*B^2*log(d*x + c)^2 + ((g^2*n^2 + 2*
g^2*n*log(e))*b^3*c^2*d - 2*(g^2*n^2 + 3*g^2*n*log(e))*a*b^2*c*d^2 + (g^2*n
^2 + 4*g^2*n*log(e) + 3*g^2*log(e)^2)*a^2*b*d^3)*B^2*x + (2*a*b^2*c^2*d*g^2
*n^2 - 5*a^2*b*c*d^2*g^2*n^2 + (3*g^2*n^2 + 2*g^2*n*log(e))*a^3*d^3)*B^2*lo
g(b*x + a) + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d
^3*g^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x
^2 + 3*B^2*a^2*b*d^3*g^2*x)*log((d*x + c)^n)^2 + (2*B^2*b^3*d^3*g^2*x^3*log
(e) + 2*B^2*a^3*d^3*g^2*n*log(b*x + a) - (b^3*c*d^2*g^2*n - (g^2*n + 6*g^2*
log(e))*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d*g^2*n - 3*a*b^2*c*d^2*g^2*n + (2*
g^2*n + 3*g^2*log(e))*a^2*b*d^3)*B^2*x - 2*(b^3*c^3*g^2*n - 3*a*b^2*c^2*d*g
^2*n + 3*a^2*b*c*d^2*g^2*n)*B^2*log(d*x + c))*log((b*x + a)^n) - (2*B^2*b^3
*d^3*g^2*x^3*log(e) + 2*B^2*a^3*d^3*g^2*n*log(b*x + a) - (b^3*c*d^2*g^2*n -
 (g^2*n + 6*g^2*log(e))*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d*g^2*n - 3*a*b^2*c
*d^2*g^2*n + (2*g^2*n + 3*g^2*log(e))*a^2*b*d^3)*B^2*x - 2*(b^3*c^3*g^2*n -
 3*a*b^2*c^2*d*g^2*n + 3*a^2*b*c*d^2*g^2*n)*B^2*log(d*x + c) + 2*(B^2*b^3*d
^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x)*log((b*x + a)
^n))*log((d*x + c)^n))/(b*d^3)
```

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

$$\text{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABb^2g^2x^2 + 2\,A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.13 $\int (ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=196

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

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

Rubi [A] time = 0.442832, antiderivative size = 309, normalized size of antiderivative = 1.58, number of steps used = 15, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

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

Rule 2528

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

Rule 2486

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

Rule 31

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

Rule 2524

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

Rule 2418

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rule 2390

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

Rule 2301

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

Rubi steps

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

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

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

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

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

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g(a+bx)^2}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g(a+bx)^2}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g(a+bx)^2}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g(a+bx)^2}{}$$

$$= -\frac{AB(bc-ad)gnx}{d} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{bd} + \frac{g(a+bx)^2}{}$$

Mathematica [A] time = 0.199556, size = 215, normalized size = 1.1

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.276, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 3.80973, size = 1118, normalized size = 5.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABbgx + ABag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.14 $\int \frac{\left(A+B \log \left(e \left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{ag+bgx} \, dx$

Optimal. Leaf size=138

$$\frac{2BnPolyLog\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bg}+\frac{2B^2n^2PolyLog\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{bg}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right.}{bg}$$

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

Rubi [B] time = 3.57289, antiderivative size = 789, normalized size of antiderivative = 5.72, number of steps used = 45, number of rules used = 23, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.657, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396}

$$\frac{2ABnPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}-\frac{2B^2nPolyLog\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\log\left((a+bx)^n\right)+\log\left((c+dx)^{-n}\right)\right)}{bg}-\frac{2B^2}{}$$

Antiderivative was successfully verified.

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

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

```
[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*n*(L
og[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*Pol
yLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*n*Log[(c + d*x)^(-n)]
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) - (2*B^2*n^2*PolyLog[3, -((d*
(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c
- a*d)])/(b*g)
```

Rule 2524

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

Rule 2528

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

Rule 2418

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

Rule 2390

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

Rule 2301

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

Rule 2394

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

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

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

Rule 2391

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

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

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

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
```

```
g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

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

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

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

Rubi steps

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

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

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

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

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

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

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

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

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

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{2B^2n\log(g(a+bx))\log\left((a+bx)^n\right)\log(-c-dx)}{bg} - \frac{B^2\log(g}{}$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{2B^2n\log(g(a+bx))\log\left((a+bx)^n\right)\log(-c-dx)}{bg} + \frac{B^2\log\left(\right.}{}$$

$$= -\frac{ABn\log^2(g(a+bx))}{bg} + \frac{B^2n^2\log^3(g(a+bx))}{3bg} - \frac{B^2n^2\log^2(g(a+bx))\log(-c-dx)}{bg} +$$

Mathematica [B] time = 0.415522, size = 537, normalized size = 3.89

$$3Bn\left(-2\left(\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log\left(\frac{c}{d}+x\right)\log\left(\frac{d(a+bx)}{ad-bc}\right)\right)-2\log(a+bx)\left(-\log\left(\frac{a+bx}{c+dx}\right)+\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)\right)+\log$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.437, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{B^2\log(bx+a)\log\left((dx+c)^n\right)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2ABbc\log(e)+\left(B^2bdx+B^2bc\right)\log\left((bx+a)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2}{bgx+ag}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.15 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=136

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

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

Rubi [C] time = 0.840441, antiderivative size = 512, normalized size of antiderivative = 3.76, number of steps used = 24, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

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

Rule 2525

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

Rule 12

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

Rule 2528

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

Rule 44

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

Rule 2524

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

Rule 2418

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

Rule 2390

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

```
qQ[e*f - d*g, 0]
```

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

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

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

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

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

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

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

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

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

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

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

Mathematica [C] time = 0.598637, size = 330, normalized size = 2.43

$$-\frac{Bn\left(-Bdn(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bdn(a+bx)\left(2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2(\right.}{}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.436, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.23068, size = 581, normalized size = 4.27

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Fricas [A] time = 0.928436, size = 555, normalized size = 4.08

$$-\frac{A^2bc - A^2ad + 2\left(B^2bc - B^2ad\right)n^2 + \left(B^2bc - B^2ad\right)\log\left(e\right)^2 + \left(B^2bdn^2x + B^2bcn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^2 + 2\left(ABbc - ABad\right)n + 2}{\left(b^3c - ab^2d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.16 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=288

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

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

Rubi [C] time = 0.922785, antiderivative size = 626, normalized size of antiderivative = 2.17, number of steps used = 28, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

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

```
*d)])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
- a*d))])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*n^2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 2525

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

Rule 12

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

Rule 2528

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

Rule 44

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

Rule 2524

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

Rule 2418

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

```
RFx, x] && IntegerQ[p]
```

Rule 2390

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

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

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

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

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

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

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

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

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

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

$$= -\frac{B^2n^2}{4bg^3(a+bx)^2} + \frac{3B^2dn^2}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2n^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2n^2\log^2(a+b}{2b(bc-ad)^2g^3}$$

$$= -\frac{B^2n^2}{4bg^3(a+bx)^2} + \frac{3B^2dn^2}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2n^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2n^2\log^2(a+b}{2b(bc-ad)^2g^3}$$

Mathematica [C] time = 0.552988, size = 463, normalized size = 1.61

$$-\frac{Bn\left(2Bd^2n(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-2Bd^2n(a+bx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.44, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.37337, size = 1162, normalized size = 4.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, algorithm="ma
xima")
```

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

```
c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^
2*c*d + a^2*b*d^2)*g^3)) + 1/4*(2*n*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^
3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) +
 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d
*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3))*log(e*(b*x/(d*x + c) + a
/(d*x + c))^n) - (b^2*c^2 - 8*a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*
d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*l
og(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^
2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d
^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a))*log(d*x + c))*n^2/(a^2*b^3*c^
2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3
+ a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2
*g^3)*x))*B^2 - 1/2*B^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(b^3*g^3*x
^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^
2*g^3*x + a^2*b*g^3)
```

Fricas [B] time = 0.979411, size = 1354, normalized size = 4.7

$$-\frac{2\,A^2b^2c^2 - 4\,A^2abcd + 2\,A^2a^2d^2 + \left(B^2b^2c^2 - 8\,B^2abcd + 7\,B^2a^2d^2\right)n^2 + 2\left(B^2b^2c^2 - 2\,B^2abcd + B^2a^2d^2\right)\log\left(e\right)^2 - 2\left(B\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^3,x, algorithm="gi
ac")
```

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

3.17 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=448

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

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

Rubi [C] time = 1.08656, antiderivative size = 736, normalized size of antiderivative = 1.64, number of steps used = 32, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

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

Antiderivative was successfully verified.

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

```
[Out] (-2*B^2*n^2)/(27*b*g^4*(a + b*x)^3) + (5*B^2*d*n^2)/(18*b*(b*c - a*d)*g^4*(
a + b*x)^2) - (11*B^2*d^2*n^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (11*B^2*
d^3*n^2*Log[a + b*x])/(9*b*(b*c - a*d)^3*g^4) + (B^2*d^3*n^2*Log[a + b*x]^2
)/(3*b*(b*c - a*d)^3*g^4) - (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(9*b*g^4*(a + b*x)^3) + (B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b
*(b*c - a*d)*g^4*(a + b*x)^2) - (2*B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (2*B*d^3*n*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[e*((a
```

```
 + b*x)/(c + d*x))^n])^2/(3*b*g^4*(a + b*x)^3) + (11*B^2*d^3*n^2*Log[c + d*
x])/(9*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (2*B*d^3*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (B^2*d^3*n^2*Log
[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*n^2*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 2525

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

Rule 12

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

Rule 2528

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

Rule 44

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

Rule 2524

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

Rule 2418

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

Rule 2390

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

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

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

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

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

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9bg^4(a+bx)^3} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{2Bd^2n\left(A+B\log\left(e\right.\right.}{3b(bc-ad)^2g^4(a}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9bg^4(a+bx)^3} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{2Bd^2n\left(A+B\log\left(e\right.\right.}{3b(bc-ad)^2g^4(a}$$

$$= -\frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9bg^4(a+bx)^3} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{2Bd^2n\left(A+B\log\left(e\right.\right.}{3b(bc-ad)^2g^4(a}$$

$$= -\frac{2B^2n^2}{27bg^4(a+bx)^3} + \frac{5B^2dn^2}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2n^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3n^2\log(}{9b(bc-ad}$$

$$= -\frac{2B^2n^2}{27bg^4(a+bx)^3} + \frac{5B^2dn^2}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2n^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3n^2\log(}{9b(bc-ad}$$

$$= -\frac{2B^2n^2}{27bg^4(a+bx)^3} + \frac{5B^2dn^2}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2n^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3n^2\log(}{9b(bc-ad}$$

Mathematica [C] time = 0.803217, size = 609, normalized size = 1.36

$$-\frac{Bn\left(-18Bd^3n(a+bx)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18Bd^3n(a+bx)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] -(18*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(12*(b*c - a*d)^3*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]) - 36*d^3*(a + b*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])*Log[c + d*x] + 36*B*d^2*n*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Lo
g[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*n*(a + b*x)*((b*c - a*d)^2 +
 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a +
 b*x)^2*Log[c + d*x]) + 2*B*n*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x
) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*
(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*n*(a + b*x)^3*(Log[a + b*x]*(Log[a + b
*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c
) + a*d)]) + 18*B*d^3*n*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
 Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b
*c - a*d)^3)/(54*b*g^4*(a + b*x)^3)
```

Maple [F] time = 0.439, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{4}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [B] time = 1.63949, size = 1933, normalized size = 4.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, algorithm="ma
xima")
```

```
[Out] -1/9*A*B*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*
d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5
*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*
d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6
*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*
g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3
*b*d^3)*g^4)) - 1/54*(6*n*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*
d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4
*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2
 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*
b*d^2)*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^
2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*
b^2*c*d^2 - a^3*b*d^3)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + (4*b^
3*c^3 - 27*a*b^2*c^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b
^2*d^3)*x^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*
log(b*x + a)^2 - 18*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^
3)*log(d*x + c)^2 - 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*
(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*
(11*b^3*d^3*x^3 + 33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d
^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x +
 c))*n^2/(a^3*b^4*c^3*g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6
*b*d^3*g^4 + (b^7*c^3*g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b
^4*d^3*g^4)*x^3 + 3*(a*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*
g^4 - a^4*b^3*d^3*g^4)*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a
^4*b^3*c*d^2*g^4 - a^5*b^2*d^3*g^4)*x))*B^2 - 1/3*B^2*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n)^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*
b*g^4) - 2/3*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(b^4*g^4*x^3 + 3*a*
b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3
*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 1.06668, size = 2383, normalized size = 5.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/54*(18*A^2*b^3*c^3 - 54*A^2*a*b^2*c^2*d + 54*A^2*a^2*b*c*d^2 - 18*A^2*a^
3*d^3 + (4*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2 - 85*B^2*
a^3*d^3)*n^2 + 6*(11*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6*(A*B*b^3*c*d^2
```

```
 - A*B*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*
b*c*d^2 - B^2*a^3*d^3)*log(e)^2 + 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3
*n^2*x^2 + 3*B^2*a^2*b*d^3*n^2*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2
*a^2*b*c*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 + 6*(2*A*B*b^3*c^3 - 9*A*B*a*
b^2*c^2*d + 18*A*B*a^2*b*c*d^2 - 11*A*B*a^3*d^3)*n - 3*((5*B^2*b^3*c^2*d -
54*B^2*a*b^2*c*d^2 + 49*B^2*a^2*b*d^3)*n^2 + 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2
*c*d^2 + 5*A*B*a^2*b*d^3)*n)*x + 6*(6*A*B*b^3*c^3 - 18*A*B*a*b^2*c^2*d + 18
*A*B*a^2*b*c*d^2 - 6*A*B*a^3*d^3 + 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n*x^2
- 3*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*n*x + (2*B^2*b^3*
c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d^2 - 11*B^2*a^3*d^3)*n + 6*(B^2*b
^3*d^3*n*x^3 + 3*B^2*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + (B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*n)*log((b*x + a)/(d*x + c)))*log(e)
 + 6*((11*B^2*b^3*d^3*n^2 + 6*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 9*B^2*a
*b^2*c^2*d + 18*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B*a*b^2*d^3*n + (2*B^2*b^3*c*
d^2 + 9*B^2*a*b^2*d^3)*n^2)*x^2 + 6*(A*B*b^3*c^3 - 3*A*B*a*b^2*c^2*d + 3*A*
B*a^2*b*c*d^2)*n + 3*(6*A*B*a^2*b*d^3*n - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^
2 - 6*B^2*a^2*b*d^3)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^7*c^3 - 3*a*b^6*
c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c
^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*
c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c^2
*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^4,x, algorithm="gi
ac")
```

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

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

Optimal. Leaf size=615

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

```
[Out] (2*B^2*d^3*n^2*(c + d*x))/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*B^2*d^2*n^2*
(c + d*x)^2)/(4*(b*c - a*d)^4*g^5*(a + b*x)^2) + (2*b^2*B^2*d*n^2*(c + d*x)
^3)/(9*(b*c - a*d)^4*g^5*(a + b*x)^3) - (b^3*B^2*n^2*(c + d*x)^4)/(32*(b*c
- a*d)^4*g^5*(a + b*x)^4) + (2*B*d^3*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*B*d^2*n*(c + d*x)^2*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c - a*d)^4*g^5*(a + b*x)^2) + (2*
b^2*B*d*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d
)^4*g^5*(a + b*x)^3) - (b^3*B*n*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(8*(b*c - a*d)^4*g^5*(a + b*x)^4) + (d^3*(c + d*x)*(A + B*Log[e*((
a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*d^2*(c + d*
x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^4*g^5*(a + b*
x)^2) + (b^2*d*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c
- a*d)^4*g^5*(a + b*x)^3) - (b^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2)/(4*(b*c - a*d)^4*g^5*(a + b*x)^4)
```

Rubi [C] time = 1.31405, antiderivative size = 826, normalized size of antiderivative = 1.34, number of steps used = 36, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2n^2\log^2(a+bx)d^4}{4b(bc-ad)^4g^5}-\frac{B^2n^2\log^2(c+dx)d^4}{4b(bc-ad)^4g^5}+\frac{25B^2n^2\log(a+bx)d^4}{24b(bc-ad)^4g^5}+\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)d^4}{2b(bc-ad)^4g^5}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -(B^2*n^2)/(32*b*g^5*(a + b*x)^4) + (7*B^2*d*n^2)/(72*b*(b*c - a*d)*g^5*(a
+ b*x)^3) - (13*B^2*d^2*n^2)/(48*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2
*d^3*n^2)/(24*b*(b*c - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*n^2*Log[a + b*x]
)/(24*b*(b*c - a*d)^4*g^5) - (B^2*d^4*n^2*Log[a + b*x]^2)/(4*b*(b*c - a*d)^
```

```
4*g^5) - (B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(8*b*g^5*(a + b*x)^4)
 + (B*d*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*(b*c - a*d)*g^5*(a +
 b*x)^3) - (B*d^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b*(b*c - a*d
)^2*g^5*(a + b*x)^2) + (B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
b*(b*c - a*d)^3*g^5*(a + b*x)) + (B*d^4*n*Log[a + b*x]*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2/(4*b*g^5*(a + b*x)^4) - (25*B^2*d^4*n^2*Log[c + d*x])/(24*b*(b*
c - a*d)^4*g^5) + (B^2*d^4*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(2*b*(b*c - a*d)^4*g^5) - (B*d^4*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B^2*d^4*n^2*Log[c + d*x]^2)/(4*
b*(b*c - a*d)^4*g^5) + (B^2*d^4*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*n^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*n^2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5)
```

Rule 2525

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

Rule 12

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

Rule 2528

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

Rule 44

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

Rule 2524

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

Rule 2418

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

Rule 2390

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

Rule 2301

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

Rule 2394

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

Rule 2393

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

Rule 2391

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

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

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

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad)n)\int\left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(a+bx)^5} - \frac{bd\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2(a+bx)^4} \cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)^5}\,dx}{2g^5} + \frac{\left(Bd^4n\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{2(bc-ad)^4g^5} \cdots$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8bg^5(a+bx)^4} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.\cdots}{4b(bc-ad)^2g^5(a+b\cdots}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8bg^5(a+bx)^4} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.\cdots}{4b(bc-ad)^2g^5(a+b\cdots}$$

$$= -\frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8bg^5(a+bx)^4} + \frac{Bdn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2n\left(A+B\log\left(e\left(\frac{a+\cdots}{c+\cdots}\right.\right.\right.\cdots}{4b(bc-ad)^2g^5(a+b\cdots}$$

$$= -\frac{B^2n^2}{32bg^5(a+bx)^4} + \frac{7B^2dn^2}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2n^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2\cdots}{24b(bc-ad\cdots}$$

$$= -\frac{B^2n^2}{32bg^5(a+bx)^4} + \frac{7B^2dn^2}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2n^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2\cdots}{24b(bc-ad\cdots}$$

$$= -\frac{B^2n^2}{32bg^5(a+bx)^4} + \frac{7B^2dn^2}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2n^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2\cdots}{24b(bc-ad\cdots}$$

<u>Mathematica</u> [C] time = 1.18765, size = 776, normalized size = 1.26

$$-\frac{\frac{Bn\left(72Bd^4n(a+bx)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-72Bd^4n(a+bx)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+d\cdots\right.\right.\right.}{\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -(72*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(36*(b*c - a*d)^4*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]) + 144*d^4*(a + b*x)^4*(A + B*Log[e*((a + b*
x)/(c + d*x))^n])*Log[c + d*x] - 144*B*d^3*n*(a + b*x)^3*(b*c - a*d + d*(a
+ b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*n*(a + b*x)^2*((
b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x
] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*n*(a + b*x)*(2*(b*c - a*d)^3 -
3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*
x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*n*(3*(b*c - a*d)^
4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d
^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a
 + b*x)^4*Log[c + d*x]) + 72*B*d^4*n*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x
] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
+ a*d)]) - 72*B*d^4*n*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - L
og[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c
 - a*d)^4)/(288*b*g^5*(a + b*x)^4)
```

Maple [F] time = 0.451, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{5}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x)
```

Maxima [B] time = 2.03168, size = 2884, normalized size = 4.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, algorithm="ma
xima")
```

```
[Out] 1/24*A*B*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^
2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d
^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*
d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2
*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^
4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) + 1/288*(1
2*n*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3
*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*
a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^
5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5
*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^
5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g
^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) +
 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*
b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d
 + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(e*(b*x/(d*x +
 c) + a/(d*x + c))^n) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^2 -
 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13*b^
4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*a*
b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^2 +
 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^
4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*c*d
^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*
x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a*b^
3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4*d^
4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(
b*x + a))*log(d*x + c))*n^2/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*
b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*
b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g
^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 - 1/4*B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 +
```

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

Fricas [B] time = 1.15835, size = 3615, normalized size = 5.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/288*(72*A^2*b^4*c^4 - 288*A^2*a*b^3*c^3*d + 432*A^2*a^2*b^2*c^2*d^2 - 28
8*A^2*a^3*b*c*d^3 + 72*A^2*a^4*d^4 - 12*(25*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)
*n^2 + 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 + (9*B^2*b^4*c^4 - 64*B^2*
a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 576*B^2*a^3*b*c*d^3 + 415*B^2*a^4*d
^4)*n^2 + 6*((13*B^2*b^4*c^2*d^2 - 176*B^2*a*b^3*c*d^3 + 163*B^2*a^2*b^2*d^
4)*n^2 + 12*(A*B*b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*n)*x^
2 + 72*(B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3
*b*c*d^3 + B^2*a^4*d^4)*log(e)^2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^
4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n^2*x^2 + 4*B^2*a^3*b*d^4*n^2*x - (B^2*b^4*c^
4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n^2)*log
((b*x + a)/(d*x + c))^2 + 12*(3*A*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 36*A*B*a
^2*b^2*c^2*d^2 - 48*A*B*a^3*b*c*d^3 + 25*A*B*a^4*d^4)*n - 4*((7*B^2*b^4*c^3
*d - 60*B^2*a*b^3*c^2*d^2 + 324*B^2*a^2*b^2*c*d^3 - 271*B^2*a^3*b*d^4)*n^2
+ 12*(A*B*b^4*c^3*d - 6*A*B*a*b^3*c^2*d^2 + 18*A*B*a^2*b^2*c*d^3 - 13*A*B*a
^3*b*d^4)*n)*x + 12*(12*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 72*A*B*a^2*b^2*c
^2*d^2 - 48*A*B*a^3*b*c*d^3 + 12*A*B*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*a*b^
3*d^4)*n*x^3 + 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d^4)*
n*x^2 - 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 - 13*
B^2*a^3*b*d^4)*n*x + (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c
^2*d^2 - 48*B^2*a^3*b*c*d^3 + 25*B^2*a^4*d^4)*n - 12*(B^2*b^4*d^4*n*x^4 + 4
*B^2*a*b^3*d^4*n*x^3 + 6*B^2*a^2*b^2*d^4*n*x^2 + 4*B^2*a^3*b*d^4*n*x - (B^2
*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n
)*log((b*x + a)/(d*x + c)))*log(e) - 12*((25*B^2*b^4*d^4*n^2 + 12*A*B*b^4*d
^4*n)*x^4 + 4*(12*A*B*a*b^3*d^4*n + (3*B^2*b^4*c*d^3 + 22*B^2*a*b^3*d^4)*n^
2)*x^3 - (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c^2*d^2 - 48*
B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B*a^2*b^2*d^4*n - (B^2*b^4*c^2*d^2 - 8*B^2*a
*b^3*c*d^3 - 18*B^2*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B*b^4*c^4 - 4*A*B*a*b^3*c
^3*d + 6*A*B*a^2*b^2*c^2*d^2 - 4*A*B*a^3*b*c*d^3)*n + 4*(12*A*B*a^3*b*d^4*n
```

```
 + (B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 + 12*B^2*a^3
*b*d^4)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2
*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^
2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 +
6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^
6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 -
 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*
a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(b*g*x+a*g)^5,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(b*g*x + a*g)^5, x)
```

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

Optimal. Leaf size=37

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

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

Rubi [A] time = 0.232895, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

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

Verification is Not applicable to the result.

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

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

Rubi steps

$$\int \frac{(ag+bgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx = \int \left(\frac{a^2g^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{2abg^2x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{b^2g^2x^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx$$

$$= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(b^2g^2\right)\int \frac{}{A}$$

Mathematica [A] time = 0.748981, size = 0, normalized size = 0.

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

Verification is Not applicable to the result.

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

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

Maple [A] time = 0.401, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=35

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

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

Rubi [A] time = 0.114719, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

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

Verification is Not applicable to the result.

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

```
[Out] a*g*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + b*g*Defer[
Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{bgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= (ag)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.284075, size = 0, normalized size = 0.

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

Verification is Not applicable to the result.

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

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

Maple [A] time = 0.307, size = 0, normalized size = 0.

$$\int (bgx+ag)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.21 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=37

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi [A] time = 0.081441, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.144034, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Maple [A] time = 0.546, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

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

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

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

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

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

$$\mathrm{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

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

$$\int \frac{1}{(bgx + ag)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

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

3.22 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=94

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

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

Rubi [F] time = 0.0990798, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.131033, size = 94, normalized size = 1.

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

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

Maple [F] time = 0.444, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{1}{(bgx+ag)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

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

Fricas [A] time = 0.867845, size = 149, normalized size = 1.59

$$\frac{e^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)}{(Bbc-Bad)g^2n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

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

$$\int \frac{1}{(bgx+ag)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

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

3.23 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=197

$$\frac{be^{\frac{2A}{Bn}}(c+dx)^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}\text{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bg^3n(a+bx)^2(bc-ad)^2}-\frac{de^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^3n(a+bx)(bc-ad)^2}$$

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

Rubi [F] time = 0.0821707, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.2969, size = 172, normalized size = 0.87

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(be^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)-d(a+bx)\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)\right)}{Bg^3n(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

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

Maple [F] time = 0.437, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

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

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

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

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

Fricas [A] time = 0.936258, size = 354, normalized size = 1.8

$$-\frac{de^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)-be^{\left(\frac{2(B\log(e)+A)}{Bn}\right)}\operatorname{log\_integral}\left(\frac{\left(d^2x^2+2\,cdx+c^2\right)e^{\left(-\frac{2(B\log(e)+A)}{Bn}\right)}}{b^2x^2+2\,abx+a^2}\right)}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)g^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

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

$$\int \frac{1}{(bgx+ag)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

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

3.24 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=37

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

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

Rubi [A] time = 0.237531, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

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

Verification is Not applicable to the result.

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

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

Rubi steps

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx = \int \left(\frac{a^2g^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right.$$

$$=\left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+\left(b\right.$$

Mathematica [A] time = 0.983394, size = 0, normalized size = 0.

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

Verification is Not applicable to the result.

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

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

Maple [A] time = 0.395, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{b^3dg^2x^4+a^3cg^2+\left(b^3cg^2+3\,ab^2dg^2\right)x^3+3\left(ab^2cg^2+a^2bdg^2\right)x^2+\left(3\,a^2bcg^2+a^3dg^2\right)x}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^2}+\int\frac{}{(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=35

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

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

Rubi [A] time = 0.125693, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

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

Verification is Not applicable to the result.

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

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

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.93374, size = 0, normalized size = 0.

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

Verification is Not applicable to the result.

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

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

Maple [A] time = 0.254, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{b^2dgx^3+a^2cg+\left(b^2cg+2\,abdg\right)x^2+\left(2\,abcg+a^2dg\right)x}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^2}+\int \frac{}{(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

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

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.26 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

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

Rubi [A] time = 0.0908582, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]

[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.530636, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

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

Maple [A] time = 0.437, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$d\int \frac{1}{\left(bcgn-adgn\right)B^2\log\left((bx+a)^n\right)-\left(bcgn-adgn\right)B^2\log\left((dx+c)^n\right)+\left(bcgn-adgn\right)AB+\left(bcgn\log\left(e\right)-adgn\log\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

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

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

$$\text{integral}\left(\frac{1}{A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABbgx + ABag\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

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

$$\int \frac{1}{\left(bgx + ag\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

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

3.27 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=153

$$-\frac{e^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^2n^2(a+bx)(bc-ad)}-\frac{c+dx}{Bg^2n(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

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

Rubi [F] time = 0.104589, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.182995, size = 146, normalized size = 0.95

$$-\frac{(c+dx)\left(e^{\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\mathrm{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)+Bn\right)}{B^2g^2n^2(a+bx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

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

Maple [F] time = 0.441, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{}{\left(abcg^2n-a^2dg^2n\right)AB+\left(abcg^2n\log(e)-a^2dg^2n\log(e)\right)B^2+\left(\left(b^2cg^2n-abdg^2n\right)AB+\left(b^2cg^2n\log(e)-abdg^2n\log(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

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

Fricas [A] time = 0.930972, size = 598, normalized size = 3.91

$$-\frac{Bdnx + Bcn + \left(Abx + Aa + (Bbx + Ba)\log\left(e\right) + (Bbnx + Ban)\log\left(\frac{bx+a}{dx+c}\right)\right)e^{\left(\frac{B\log(e)+A}{Bn}\right)}\,\mathrm{log\_i}}{\left(AB^2b^2c - AB^2abd\right)g^2n^2x + \left(AB^2abc - AB^2a^2d\right)g^2n^2 + \left(\left(B^3b^2c - B^3abd\right)g^2n^2x + \left(B^3abc - B^3a^2d\right)g^2n^2\right)\log\left(e\right) + \left(\left(B^3\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

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

$$\int \frac{1}{\left(bgx+ag\right)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

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

3.28 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=314

$$-\frac{2be^{\frac{2A}{Bn}}(c+dx)^2\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}\text{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2g^3n^2(a+bx)^2(bc-ad)^2}+\frac{de^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^3n^2(a+bx)(bc-ad)^2}-\frac{\quad}{Bg^3n(a+b}$$

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

Rubi [F] time = 0.0928482, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

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

Rubi steps

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

Mathematica [A] time = 0.643753, size = 254, normalized size = 0.81

$$\frac{(c+dx)\left(-2be^{\frac{2A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{2/n}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\text{Ei}\left(-\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)+d(a+bx)e^{\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(B\right.\right.}{B^2g^3n^2(a+bx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

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

Maple [F] time = 0.438, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

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

Fricas [B] time = 0.953429, size = 1612, normalized size = 5.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

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

$$\int \frac{1}{(bgx+ag)^3 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

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

3.29 $\int (cg+dgx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=188

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

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

Rubi [A] time = 0.127825, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

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

Antiderivative was successfully verified.

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


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


Rule 2525

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

Rule 12

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

Rule 43

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

Rubi steps

$$\int (cg+dgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx=\frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5d}-\frac{(Bn)\int\frac{(bc-ad)g^5(c+dx)^4}{a+bx}\,dx}{5dg}$$

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

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

$$=-\frac{B(bc-ad)^4g^4nx}{5b^4}-\frac{B(bc-ad)^3g^4n(c+dx)^2}{10b^3d}-\frac{B(bc-ad)^2g^4n(c+dx)^3}{15b^2d}$$

Mathematica [A] time = 0.105292, size = 146, normalized size = 0.78

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

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (g^4*(-(B*(b*c - a*d)*n*(12*b*d*(b*c - a*d)^3*x + 6*b^2*(b*c - a*d)^2*(c +
d*x)^2 + 4*b^3*(b*c - a*d)*(c + d*x)^3 + 3*b^4*(c + d*x)^4 + 12*(b*c - a*d)
^4*Log[a + b*x]))/(12*b^5) + (c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])))/(5*d)
```

Maple [F] time = 0.522, size = 0, normalized size = 0.

$$\int \left(dgx+cg\right)^{4} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*g*x+c*g)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.24272, size = 913, normalized size = 4.86

$$\frac{1}{5}\,Bd^{4}g^{4}x^{5}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{5}\,Ad^{4}g^{4}x^{5}+Bcd^{3}g^{4}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Acd^{3}g^{4}x^{4}+2\,Bc^{2}d^{2}g^{4}x^{3}\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] 1/5*B*d^4*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*d^4*g^4*x^
5 + B*c*d^3*g^4*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*d^3*g^4*x^
4 + 2*B*c^2*d^2*g^4*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*c^2*d^
2*g^4*x^3 + 2*B*c^3*d*g^4*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*
c^3*d*g^4*x^2 + 1/60*B*d^4*g^4*n*(12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x
+ c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x
^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) -
 1/6*B*c*d^3*g^4*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b
^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^
3*d^3)*x)/(b^3*d^3)) + B*c^2*d^2*g^4*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(
d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2
)) - 2*B*c^3*d*g^4*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c -
a*d)*x/(b*d)) + B*c^4*g^4*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c^4*g
^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c^4*g^4*x
```

Fricas [B] time = 1.06928, size = 1188, normalized size = 6.32

$$\frac{12\,Ab^{5}d^{5}g^{4}x^{5}-12\,Bb^{5}c^{5}g^{4}n\log\left(dx+c\right)+12\left(5\,Bab^{4}c^{4}d-10\,Ba^{2}b^{3}c^{3}d^{2}+10\,Ba^{3}b^{2}c^{2}d^{3}-5\,Ba^{4}bcd^{4}+Ba^{5}d^{5}\right)g^{4}n\log\left(bx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 - 12*B*b^5*c^5*g^4*n*log(d*x + c) + 12*(5*B*a*b^
4*c^4*d - 10*B*a^2*b^3*c^3*d^2 + 10*B*a^3*b^2*c^2*d^3 - 5*B*a^4*b*c*d^4 + B
*a^5*d^5)*g^4*n*log(b*x + a) + 3*(20*A*b^5*c*d^4*g^4 - (B*b^5*c*d^4 - B*a*b
^4*d^5)*g^4*n)*x^4 + 4*(30*A*b^5*c^2*d^3*g^4 - (4*B*b^5*c^2*d^3 - 5*B*a*b^4
*c*d^4 + B*a^2*b^3*d^5)*g^4*n)*x^3 + 6*(20*A*b^5*c^3*d^2*g^4 - (6*B*b^5*c^3
*d^2 - 10*B*a*b^4*c^2*d^3 + 5*B*a^2*b^3*c*d^4 - B*a^3*b^2*d^5)*g^4*n)*x^2 +
 12*(5*A*b^5*c^4*d*g^4 - (4*B*b^5*c^4*d - 10*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3
*c^2*d^3 - 5*B*a^3*b^2*c*d^4 + B*a^4*b*d^5)*g^4*n)*x + 12*(B*b^5*d^5*g^4*x^
5 + 5*B*b^5*c*d^4*g^4*x^4 + 10*B*b^5*c^2*d^3*g^4*x^3 + 10*B*b^5*c^3*d^2*g^4
*x^2 + 5*B*b^5*c^4*d*g^4*x)*log(e) + 12*(B*b^5*d^5*g^4*n*x^5 + 5*B*b^5*c*d^
4*g^4*n*x^4 + 10*B*b^5*c^2*d^3*g^4*n*x^3 + 10*B*b^5*c^3*d^2*g^4*n*x^2 + 5*B
*b^5*c^4*d*g^4*n*x)*log((b*x + a)/(d*x + c)))/(b^5*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**4*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] Timed out
```

3.30 $\int (cg+dgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=156

$$\frac{g^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d}-\frac{Bg^3nx(bc-ad)^3}{4b^3}-\frac{Bg^3n(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bg^3n(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bg^3n\cdots}{}$$

```
[Out] -(B*(b*c - a*d)^3*g^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*g^3*n*(c + d*x)^2)/(8
*b^2*d) - (B*(b*c - a*d)*g^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*g^3
*n*Log[a + b*x])/(4*b^4*d) + (g^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*d)
```

Rubi [A] time = 0.1021, antiderivative size = 156, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

$$\frac{g^3(c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4d}-\frac{Bg^3nx(bc-ad)^3}{4b^3}-\frac{Bg^3n(c+dx)^2(bc-ad)^2}{8b^2d}-\frac{Bg^3n(bc-ad)^4\log(a+bx)}{4b^4d}-\frac{Bg^3n\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)^3*g^3*n*x)/(4*b^3) - (B*(b*c - a*d)^2*g^3*n*(c + d*x)^2)/(8
*b^2*d) - (B*(b*c - a*d)*g^3*n*(c + d*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*g^3
*n*Log[a + b*x])/(4*b^4*d) + (g^3*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c +
d*x))^n]))/(4*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d}-\frac{(Bn)\int\frac{(bc-ad)g^4(c+dx)^3}{a+bx}dx}{4dg}$$

$$=\frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d}-\frac{\left(B(bc-ad)g^3n\right)\int\frac{(c+dx)^3}{a+bx}dx}{4d}$$

$$=\frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4d}-\frac{\left(B(bc-ad)g^3n\right)\int\left(\frac{d(bc-ad)^2}{b^3}+\frac{(bc-}{b^3(a}\right.}{4}$$

$$=-\frac{B(bc-ad)^3g^3nx}{4b^3}-\frac{B(bc-ad)^2g^3n(c+dx)^2}{8b^2d}-\frac{B(bc-ad)g^3n(c+dx)^3}{12bd}$$

Mathematica [A] time = 0.0937343, size = 124, normalized size = 0.79

$$\frac{g^3\left((c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)\left(3b^2(c+dx)^2(bc-ad)+6bdx(bc-ad)^2+6(bc-ad)^3\log(a+bx)+2b^3(c+dx)^3\right)}{6b^4}\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (g^3*(-(B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*b^2*(b*c - a*d)*(c + d*x
)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b*x]))/(6*b^4) + (c + d*x
)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(4*d)
```

Maple [F] time = 0.411, size = 0, normalized size = 0.

$$\int \left(dgx+cg\right)^{3} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*g*x+c*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.25501, size = 647, normalized size = 4.15

$$\frac{1}{4}\,Bd^{3}g^{3}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{4}\,Ad^{3}g^{3}x^{4}+Bcd^{2}g^{3}x^{3}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Acd^{2}g^{3}x^{3}+\frac{3}{2}\,Bc^{2}dg^{3}x^{2}\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] 1/4*B*d^3*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*d^3*g^3*x^
4 + B*c*d^2*g^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*d^2*g^3*x^
3 + 3/2*B*c^2*d*g^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*c^2*
d*g^3*x^2 - 1/24*B*d^3*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d
^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^
3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 1/2*B*c*d^2*g^3*n*(2*a^3*log(b*x + a)/b^3
- 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)
*x)/(b^2*d^2)) - 3/2*B*c^2*d*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)
/d^2 + (b*c - a*d)*x/(b*d)) + B*c^3*g^3*n*(a*log(b*x + a)/b - c*log(d*x + c
)/d) + B*c^3*g^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c^3*g^3*x
```

Fricas [B] time = 1.07087, size = 883, normalized size = 5.66

$$6\,Ab^{4}d^{4}g^{3}x^{4}-6\,Bb^{4}c^{4}g^{3}n\log\left(dx+c\right)+6\left(4\,Bab^{3}c^{3}d-6\,Ba^{2}b^{2}c^{2}d^{2}+4\,Ba^{3}bcd^{3}-Ba^{4}d^{4}\right)g^{3}n\log\left(bx+a\right)+2\left(12\,Ab^{4}cd\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 - 6*B*b^4*c^4*g^3*n*log(d*x + c) + 6*(4*B*a*b^3*c
^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*b*c*d^3 - B*a^4*d^4)*g^3*n*log(b*x + a
) + 2*(12*A*b^4*c*d^3*g^3 - (B*b^4*c*d^3 - B*a*b^3*d^4)*g^3*n)*x^3 + 3*(12*
A*b^4*c^2*d^2*g^3 - (3*B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*g^3
*n)*x^2 + 6*(4*A*b^4*c^3*d*g^3 - (3*B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 4*B*a
^2*b^2*c*d^3 - B*a^3*b*d^4)*g^3*n)*x + 6*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*c*d^3
*g^3*x^3 + 6*B*b^4*c^2*d^2*g^3*x^2 + 4*B*b^4*c^3*d*g^3*x)*log(e) + 6*(B*b^4
*d^4*g^3*n*x^4 + 4*B*b^4*c*d^3*g^3*n*x^3 + 6*B*b^4*c^2*d^2*g^3*n*x^2 + 4*B*
b^4*c^3*d*g^3*n*x)*log((b*x + a)/(d*x + c)))/(b^4*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 143.004, size = 537, normalized size = 3.44

$$-\frac{Bc^4g^3n\log(-dx-c)}{4d}+\frac{1}{4}\left(Ad^3g^3+Bd^3g^3\right)x^4-\frac{\left(Bbcd^2g^3n-Bad^3g^3n-12\,Abcd^2g^3-12\,Bbcd^2g^3\right)x^3}{12\,b}+\frac{1}{4}\left(Bd^3g^3nx^4\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] -1/4*B*c^4*g^3*n*log(-d*x - c)/d + 1/4*(A*d^3*g^3 + B*d^3*g^3)*x^4 - 1/12*(
B*b*c*d^2*g^3*n - B*a*d^3*g^3*n - 12*A*b*c*d^2*g^3 - 12*B*b*c*d^2*g^3)*x^3/
b + 1/4*(B*d^3*g^3*n*x^4 + 4*B*c*d^2*g^3*n*x^3 + 6*B*c^2*d*g^3*n*x^2 + 4*B*
c^3*g^3*n*x)*log((b*x + a)/(d*x + c)) - 1/8*(3*B*b^2*c^2*d*g^3*n - 4*B*a*b*
c*d^2*g^3*n + B*a^2*d^3*g^3*n - 12*A*b^2*c^2*d*g^3 - 12*B*b^2*c^2*d*g^3)*x^
2/b^2 - 1/4*(3*B*b^3*c^3*g^3*n - 6*B*a*b^2*c^2*d*g^3*n + 4*B*a^2*b*c*d^2*g^
```

```
3*n - B*a^3*d^3*g^3*n - 4*A*b^3*c^3*g^3 - 4*B*b^3*c^3*g^3)*x/b^3 + 1/4*(4*B
*a*b^3*c^3*g^3*n - 6*B*a^2*b^2*c^2*d*g^3*n + 4*B*a^3*b*c*d^2*g^3*n - B*a^4*
d^3*g^3*n)*log(b*x + a)/b^4
```

3.31 $\int (cg+dgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=124

$$\frac{g^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d}-\frac{Bg^2nx(bc-ad)^2}{3b^2}-\frac{Bg^2n(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bg^2n(c+dx)^2(bc-ad)}{6bd}$$

```
[Out] -(B*(b*c - a*d)^2*g^2*n*x)/(3*b^2) - (B*(b*c - a*d)*g^2*n*(c + d*x)^2)/(6*b
*d) - (B*(b*c - a*d)^3*g^2*n*Log[a + b*x])/(3*b^3*d) + (g^2*(c + d*x)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)
```

Rubi [A] time = 0.0813244, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 43}

$$\frac{g^2(c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3d}-\frac{Bg^2nx(bc-ad)^2}{3b^2}-\frac{Bg^2n(bc-ad)^3\log(a+bx)}{3b^3d}-\frac{Bg^2n(c+dx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```


```
[Out] -(B*(b*c - a*d)^2*g^2*n*x)/(3*b^2) - (B*(b*c - a*d)*g^2*n*(c + d*x)^2)/(6*b
*d) - (B*(b*c - a*d)^3*g^2*n*Log[a + b*x])/(3*b^3*d) + (g^2*(c + d*x)^3*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d} - \frac{(Bn)\int\frac{(bc-ad)g^3(c+dx)^2}{a+bx}\,dx}{3dg}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d} - \frac{\left(B(bc-ad)g^2n\right)\int\frac{(c+dx)^2}{a+bx}\,dx}{3d}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d} - \frac{\left(B(bc-ad)g^2n\right)\int\left(\frac{d(bc-ad)}{b^2}+\frac{(bc-ad}{b^2(a+b}\right.}{3d}$$

$$= -\frac{B(bc-ad)^2g^2nx}{3b^2} - \frac{B(bc-ad)g^2n(c+dx)^2}{6bd} - \frac{B(bc-ad)^3g^2n\log(a+bx}{3b^3d}$$

Mathematica [A] time = 0.0597527, size = 101, normalized size = 0.81

$$\frac{g^2\left((c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)\left(2bdx(bc-ad)+2(bc-ad)^2\log(a+bx)+b^2(c+dx)^2\right)}{2b^3}\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (g^2*(-(B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c - a
*d)^2*Log[a + b*x]))/(2*b^3) + (c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x
))^n])))/(3*d)
```

Maple [F] time = 0.404, size = 0, normalized size = 0.

$$\int\left(dgx+cg\right)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*g*x+c*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [B] time = 1.19467, size = 417, normalized size = 3.36

$$\frac{1}{3}Bd^2g^2x^3\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{3}Ad^2g^2x^3+Bcdg^2x^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Acdg^2x^2+\frac{1}{6}Bd^2g^2n\left(\frac{2a^3 l\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] 1/3*B*d^2*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*d^2*g^2*x^
3 + B*c*d*g^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*c*d*g^2*x^2 +
1/6*B*d^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*c*d*g^2*n*(a^2*l
og(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*c^2*g^2*n
*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c^2*g^2*x*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n) + A*c^2*g^2*x
```

Fricas [B] time = 0.974927, size = 622, normalized size = 5.02

$$\frac{2Ab^3d^3g^2x^3-2Bb^3c^3g^2n\log(dx+c)+2\left(3Bab^2c^2d-3Ba^2bcd^2+Ba^3d^3\right)g^2n\log(bx+a)+\left(6Ab^3cd^2g^2-\left(Bb^3cd^2-\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 - 2*B*b^3*c^3*g^2*n*log(d*x + c) + 2*(3*B*a*b^2*c^
2*d - 3*B*a^2*b*c*d^2 + B*a^3*d^3)*g^2*n*log(b*x + a) + (6*A*b^3*c*d^2*g^2
- (B*b^3*c*d^2 - B*a*b^2*d^3)*g^2*n)*x^2 + 2*(3*A*b^3*c^2*d*g^2 - (2*B*b^3*
c^2*d - 3*B*a*b^2*c*d^2 + B*a^2*b*d^3)*g^2*n)*x + 2*(B*b^3*d^3*g^2*x^3 + 3*
```

```
B*b^3*c*d^2*g^2*x^2 + 3*B*b^3*c^2*d*g^2*x)*log(e) + 2*(B*b^3*d^3*g^2*n*x^3
+ 3*B*b^3*c*d^2*g^2*n*x^2 + 3*B*b^3*c^2*d*g^2*n*x)*log((b*x + a)/(d*x + c))
)/(b^3*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 21.4717, size = 354, normalized size = 2.85

$$-\frac{Bc^3g^2n\log(-dx-c)}{3\,d}+\frac{1}{3}\left(Ad^2g^2+Bd^2g^2\right)x^3-\frac{\left(Bbcdg^2n-Bad^2g^2n-6\,Abcdg^2-6\,Bbcdg^2\right)x^2}{6\,b}+\frac{1}{3}\left(Bd^2g^2nx^3+3\,Bcd\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] -1/3*B*c^3*g^2*n*log(-d*x - c)/d + 1/3*(A*d^2*g^2 + B*d^2*g^2)*x^3 - 1/6*(B
*b*c*d*g^2*n - B*a*d^2*g^2*n - 6*A*b*c*d*g^2 - 6*B*b*c*d*g^2)*x^2/b + 1/3*(
B*d^2*g^2*n*x^3 + 3*B*c*d*g^2*n*x^2 + 3*B*c^2*g^2*n*x)*log((b*x + a)/(d*x +
 c)) - 1/3*(2*B*b^2*c^2*g^2*n - 3*B*a*b*c*d*g^2*n + B*a^2*d^2*g^2*n - 3*A*b
^2*c^2*g^2 - 3*B*b^2*c^2*g^2)*x/b^2 + 1/3*(3*B*a*b^2*c^2*g^2*n - 3*B*a^2*b*
c*d*g^2*n + B*a^3*d^2*g^2*n)*log(b*x + a)/b^3
```

3.32 $\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=86

$$\frac{g(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d}-\frac{Bgn(bc-ad)^2\log(a+bx)}{2b^2d}-\frac{Bgnx(bc-ad)}{2b}$$

```
[Out] -(B*(b*c - a*d)*g*n*x)/(2*b) - (B*(b*c - a*d)^2*g*n*Log[a + b*x])/(2*b^2*d)
 + (g*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)
```

Rubi [A] time = 0.0599644, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {2525, 12, 43}

$$\frac{g(c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2d}-\frac{Bgn(bc-ad)^2\log(a+bx)}{2b^2d}-\frac{Bgnx(bc-ad)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*g*n*x)/(2*b) - (B*(b*c - a*d)^2*g*n*Log[a + b*x])/(2*b^2*d)
 + (g*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx &= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}-\frac{(Bn)\int\frac{(bc-ad)g^2(c+dx)}{a+bx}\,dx}{2dg}\\ &= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}-\frac{(B(bc-ad)gn)\int\frac{c+dx}{a+bx}\,dx}{2d}\\ &= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2d}-\frac{(B(bc-ad)gn)\int\left(\frac{d}{b}+\frac{bc-ad}{b(a+bx)}\right)dx}{2d}\\ &= -\frac{B(bc-ad)gnx}{2b}-\frac{B(bc-ad)^2gn\log(a+bx)}{2b^2d}+\frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{2d}\end{aligned}$$

Mathematica [A] time = 0.0380534, size = 74, normalized size = 0.86

$$\frac{g\left((c+dx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn(bc-ad)((bc-ad)\log(a+bx)+bdx)}{b^2}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (g*(-((B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*x]))/b^2) + (c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(2*d)
```

Maple [F] time = 0.328, size = 0, normalized size = 0.

$$\int (dgx+cg)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 1.14195, size = 211, normalized size = 2.45

$$\frac{1}{2}Bdgx^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{2}Adgx^2-\frac{1}{2}Bdgn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+Bcgn\left(\frac{a\log}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] 1/2*B*d*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*d*g*x^2 - 1/2*
B*d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))
 + B*c*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*c*g*x*log(e*(b*x/(d*x
+ c) + a/(d*x + c))^n) + A*c*g*x
```

Fricas [B] time = 0.804638, size = 360, normalized size = 4.19

$$\frac{Ab^2d^2gx^2-Bb^2c^2gn\log(dx+c)+\left(2\,Babcd-Ba^2d^2\right)gn\log(bx+a)+\left(2\,Ab^2cdg-\left(Bb^2cd-Babd^2\right)gn\right)x+\left(Bb^2d^2gx^2\right.}{2\,b^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 - B*b^2*c^2*g*n*log(d*x + c) + (2*B*a*b*c*d - B*a^2*d^
2)*g*n*log(b*x + a) + (2*A*b^2*c*d*g - (B*b^2*c*d - B*a*b*d^2)*g*n)*x + (B*
b^2*d^2*g*x^2 + 2*B*b^2*c*d*g*x)*log(e) + (B*b^2*d^2*g*n*x^2 + 2*B*b^2*c*d*
g*n*x)*log((b*x + a)/(d*x + c)))/(b^2*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 3.04544, size = 173, normalized size = 2.01

$$-\frac{Bc^2gn\log\left(-dx-c\right)}{2\,d}+\frac{1}{2}\left(Adg+Bdg\right)x^2+\frac{1}{2}\left(Bdgnx^2+2\,Bcgnx\right)\log\left(\frac{bx+a}{dx+c}\right)-\frac{\left(Bbcgn-Badgn-2\,Abcg-2\,Bbcg\right)x}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] -1/2*B*c^2*g*n*log(-d*x - c)/d + 1/2*(A*d*g + B*d*g)*x^2 + 1/2*(B*d*g*n*x^2
 + 2*B*c*g*n*x)*log((b*x + a)/(d*x + c)) - 1/2*(B*b*c*g*n - B*a*d*g*n - 2*A
*b*c*g - 2*B*b*c*g)*x/b + 1/2*(2*B*a*b*c*g*n - B*a^2*d*g*n)*log(b*x + a)/b^
2
```

3.33 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{cg+dgx}\,dx$

Optimal. Leaf size=80

$$-\frac{Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{dg}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg}$$

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(
d*g)) - (B*n*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d*g)
```

Rubi [A] time = 0.20138, antiderivative size = 128, normalized size of antiderivative = 1.6, number of steps used = 9, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2524, 2418, 2394, 2393, 2391, 2390, 12, 2301}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg}+\frac{\log(cg+dgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg}-\frac{Bn\log(cg+dgx)\log\left(-\frac{d(a+bx)}{bc-ad}\right)}{dg}+\frac{Bn\log^2(g(c+\ldots}{2dg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x),x]
```

```
[Out] (B*n*Log[g*(c + d*x)]^2)/(2*d*g) - (B*n*Log[-((d*(a + b*x))/(b*c - a*d))]*L
og[c*g + d*g*x])/(d*g) + ((A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c*g +
d*g*x])/(d*g) - (B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{cg+dgx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg} - \frac{(Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\log(cg+dgx)}{a+bx}\,dx}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg} - \frac{(Bn)\int \left(\frac{b\log(cg+dgx)}{a+bx} - \frac{d\log(cg+dgx)}{c+dx}\right)dx}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg} + \frac{(Bn)\int \frac{\log(cg+dgx)}{c+dx}\,dx}{g} - \frac{(bBn)\int \frac{\log(cg+dgx)}{a+bx}\,dx}{dg}$$

$$= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg} + (Bn)\int \frac{\log}{}$$

$$= -\frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{dg} + \frac{(Bn)\,\text{Subs}}{}$$

$$= \frac{Bn\log^2(g(c+dx))}{2dg} - \frac{Bn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg}{dg}$$

Mathematica [A] time = 0.039353, size = 101, normalized size = 1.26

$$\frac{\log(g(c+dx))\left(2B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right) - 2Bn\log\left(\frac{d(a+bx)}{ad-bc}\right) + 2A + Bn\log(g(c+dx))\right) - 2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2dg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x),x]
```

```
[Out] (Log[g*(c + d*x)]*(2*A - 2*B*n*Log[(d*(a + b*x))/(-(b*c) + a*d)] + 2*B*Log[
e*((a + b*x)/(c + d*x))^n] + B*n*Log[g*(c + d*x)]) - 2*B*n*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/(2*d*g)
```

Maple [F] time = 0.531, size = 0, normalized size = 0.

$$\int \frac{1}{dgx+cg}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}B\left(\frac{2\,n\log\left(bx+a\right)\log\left(dx+c\right)-n\log\left(dx+c\right)^{2}-2\,\log\left(dx+c\right)\log\left(\left(bx+a\right)^{n}\right)+2\,\log\left(dx+c\right)\log\left(\left(dx+c\right)^{n}\right)}{dg}-2\int\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g),x, algorithm="maxima
")
```

```
[Out] -1/2*B*((2*n*log(b*x + a)*log(d*x + c) - n*log(d*x + c)^2 - 2*log(d*x + c)*
log((b*x + a)^n) + 2*log(d*x + c)*log((d*x + c)^n))/(d*g) - 2*integrate((n*
log(b*x + a) + log(e))/(d*g*x + c*g), x)) + A*log(d*g*x + c*g)/(d*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{dgx+cg},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g),x, algorithm="fricas
")
```

```
[Out] integral((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*g*x + c*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*g*x+c*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{dgx+cg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(d*g*x + c*g), x)
```

3.34 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^2}\,dx$

Optimal. Leaf size=102

$$\frac{A(a+bx)}{g^2(c+dx)(bc-ad)}+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^2(c+dx)(bc-ad)}-\frac{Bn(a+bx)}{g^2(c+dx)(bc-ad)}$$

```
[Out] (A*(a + b*x))/((b*c - a*d)*g^2*(c + d*x)) - (B*n*(a + b*x))/((b*c - a*d)*g^
2*(c + d*x)) + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/((b*c - a*d)*g^
2*(c + d*x))
```

Rubi [A] time = 0.0873029, antiderivative size = 107, normalized size of antiderivative = 1.05, number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{dg^2(c+dx)}+\frac{bBn\log(a+bx)}{dg^2(bc-ad)}-\frac{bBn\log(c+dx)}{dg^2(bc-ad)}+\frac{Bn}{dg^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^2,x]
```

```
[Out] (B*n)/(d*g^2*(c + d*x)) + (b*B*n*Log[a + b*x])/(d*(b*c - a*d)*g^2) - (A + B
*Log[e*((a + b*x)/(c + d*x))^n])/(d*g^2*(c + d*x)) - (b*B*n*Log[c + d*x])/(
d*(b*c - a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^2}\,dx &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{dg^2(c+dx)}+\frac{(Bn)\int\frac{bc-ad}{g(a+bx)(c+dx)^2}\,dx}{dg}\\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{dg^2(c+dx)}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)^2}\,dx}{dg^2}\\ &= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{dg^2(c+dx)}+\frac{(B(bc-ad)n)\int\left(\frac{b^2}{(bc-ad)^2(a+bx)}-\frac{d}{(bc-ad)(c+dx)^2}-\frac{bd}{(bc-ad)^2(c+dx)}\right)d}{dg^2}\\ &= \frac{Bn}{dg^2(c+dx)}+\frac{bBn\log(a+bx)}{d(bc-ad)g^2}-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{dg^2(c+dx)}-\frac{bBn\log(c+dx)}{d(bc-ad)g^2}\end{aligned}$$

Mathematica [A] time = 0.0602251, size = 114, normalized size = 1.12

$$\frac{Bn(bc-ad)\left(\frac{1}{(c+dx)(bc-ad)}+\frac{b\log(a+bx)}{(bc-ad)^2}-\frac{b\log(c+dx)}{(bc-ad)^2}\right)}{dg^2}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{dg(cg+dgx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^2,x]
```

```
[Out] -((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(d*g*(c*g + d*g*x))) + (B*(b*c - a
*d)*n*(1/((b*c - a*d)*(c + d*x)) + (b*Log[a + b*x])/(b*c - a*d)^2 - (b*Log[
c + d*x])/(b*c - a*d)^2))/(d*g^2)
```

Maple [F] time = 0.438, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx + cg\right)^{2}} \left(A + B \ln\left(e \left(\frac{bx + a}{dx + c}\right)^{n}\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x)
```

Maxima [A] time = 1.17496, size = 184, normalized size = 1.8

$$Bn\left(\frac{1}{d^{2}g^{2}x + cdg^{2}} + \frac{b\log\left(bx + a\right)}{\left(bcd - ad^{2}\right)g^{2}} - \frac{b\log\left(dx + c\right)}{\left(bcd - ad^{2}\right)g^{2}}\right) - \frac{B\log\left(e\left(\frac{bx}{dx+c} + \frac{a}{dx+c}\right)^{n}\right)}{d^{2}g^{2}x + cdg^{2}} - \frac{A}{d^{2}g^{2}x + cdg^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x, algorithm="maxi
ma")
```

```
[Out] B*n*(1/(d^2*g^2*x + c*d*g^2) + b*log(b*x + a)/((b*c*d - a*d^2)*g^2) - b*log
(d*x + c)/((b*c*d - a*d^2)*g^2)) - B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
/(d^2*g^2*x + c*d*g^2) - A/(d^2*g^2*x + c*d*g^2)
```

Fricas [A] time = 0.908957, size = 221, normalized size = 2.17

$$-\frac{Abc - Aad - (Bbc - Bad)n + (Bbc - Bad)\log\left(e\right) - (Bbdnx + Badn)\log\left(\frac{bx+a}{dx+c}\right)}{\left(bcd^{2} - ad^{3}\right)g^{2}x + \left(bc^{2}d - acd^{2}\right)g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x, algorithm="fric
as")
```

```
[Out] -(A*b*c - A*a*d - (B*b*c - B*a*d)*n + (B*b*c - B*a*d)*log(e) - (B*b*d*n*x +
 B*a*d*n)*log((b*x + a)/(d*x + c)))/((b*c*d^2 - a*d^3)*g^2*x + (b*c^2*d - a
```

```
*c*d^2)*g^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*g*x+c*g)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.36895, size = 166, normalized size = 1.63

$$\frac{Bbn\log(bx+a)}{bcdg^2-ad^2g^2}-\frac{Bbn\log(dx+c)}{bcdg^2-ad^2g^2}-\frac{Bn\log\left(\frac{bx+a}{dx+c}\right)}{d^2g^2x+cdg^2}+\frac{Bn-A-B}{d^2g^2x+cdg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^2,x, algorithm="giac
")
```

```
[Out] B*b*n*log(b*x + a)/(b*c*d*g^2 - a*d^2*g^2) - B*b*n*log(d*x + c)/(b*c*d*g^2
- a*d^2*g^2) - B*n*log((b*x + a)/(d*x + c))/(d^2*g^2*x + c*d*g^2) + (B*n -
A - B)/(d^2*g^2*x + c*d*g^2)
```

3.35 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^3}\,dx$

Optimal. Leaf size=151

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2dg^3(c+dx)^2}+\frac{b^2Bn\log(a+bx)}{2dg^3(bc-ad)^2}-\frac{b^2Bn\log(c+dx)}{2dg^3(bc-ad)^2}+\frac{bBn}{2dg^3(c+dx)(bc-ad)}+\frac{Bn}{4dg^3(c+dx)^2}$$

```
[Out] (B*n)/(4*d*g^3*(c + d*x)^2) + (b*B*n)/(2*d*(b*c - a*d)*g^3*(c + d*x)) + (b^
2*B*n*Log[a + b*x])/(2*d*(b*c - a*d)^2*g^3) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])/(2*d*g^3*(c + d*x)^2) - (b^2*B*n*Log[c + d*x])/(2*d*(b*c - a*d)^2
*g^3)
```

Rubi [A] time = 0.114301, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2dg^3(c+dx)^2}+\frac{b^2Bn\log(a+bx)}{2dg^3(bc-ad)^2}-\frac{b^2Bn\log(c+dx)}{2dg^3(bc-ad)^2}+\frac{bBn}{2dg^3(c+dx)(bc-ad)}+\frac{Bn}{4dg^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^3,x]
```


```
[Out] (B*n)/(4*d*g^3*(c + d*x)^2) + (b*B*n)/(2*d*(b*c - a*d)*g^3*(c + d*x)) + (b^
2*B*n*Log[a + b*x])/(2*d*(b*c - a*d)^2*g^3) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])/(2*d*g^3*(c + d*x)^2) - (b^2*B*n*Log[c + d*x])/(2*d*(b*c - a*d)^2
*g^3)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^3}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2dg^3(c+dx)^2}+\frac{(Bn)\int\frac{bc-ad}{g^2(a+bx)(c+dx)^3}\,dx}{2dg}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2dg^3(c+dx)^2}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)^3}\,dx}{2dg^3}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2dg^3(c+dx)^2}+\frac{(B(bc-ad)n)\int\left(\frac{b^3}{(bc-ad)^3(a+bx)}-\frac{d}{(bc-ad)(c+dx)^3}-\frac{bd}{(bc-ad)^2(c+dx)^2}-\right.}{2dg^3}$$

$$= \frac{Bn}{4dg^3(c+dx)^2}+\frac{bBn}{2d(bc-ad)g^3(c+dx)}+\frac{b^2Bn\log(a+bx)}{2d(bc-ad)^2g^3}-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2dg^3(c+dx)^2}-$$

Mathematica [A] time = 0.147845, size = 115, normalized size = 0.76

$$\frac{\frac{Bn\left(2b^2(c+dx)^2\log(a+bx)+(bc-ad)(-ad+3bc+2bdx)-2b^2(c+dx)^2\log(c+dx)\right)}{(bc-ad)^2}-2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4dg^3(c+dx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^3,x]
```

```
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*n*((b*c - a*d)*(3*b*c - a*d
 + 2*b*d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*
x]))/(b*c - a*d)^2)/(4*d*g^3*(c + d*x)^2)
```

Maple [F] time = 0.444, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x)
```

Maxima [A] time = 1.20754, size = 350, normalized size = 2.32

$$\frac{1}{4}Bn\left(\frac{2\,bdx+3\,bc-ad}{\left(bcd^{3}-ad^{4}\right)g^{3}x^{2}+2\left(bc^{2}d^{2}-acd^{3}\right)g^{3}x+\left(bc^{3}d-ac^{2}d^{2}\right)g^{3}}+\frac{2\,b^{2}\log\left(bx+a\right)}{\left(b^{2}c^{2}d-2\,abcd^{2}+a^{2}d^{3}\right)g^{3}}-\frac{2\,b^{2}\log\left(dx+c\right)}{\left(b^{2}c^{2}d-2\,abcd^{2}+a^{2}d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/4*B*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*g^3*x^2 + 2*(b*c^2*d^2
- a*c*d^3)*g^3*x + (b*c^3*d - a*c^2*d^2)*g^3) + 2*b^2*log(b*x + a)/((b^2*c^
2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*b*
c*d^2 + a^2*d^3)*g^3)) - 1/2*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^3*
g^3*x^2 + 2*c*d^2*g^3*x + c^2*d*g^3) - 1/2*A/(d^3*g^3*x^2 + 2*c*d^2*g^3*x +
 c^2*d*g^3)
```

Fricas [A] time = 0.794291, size = 562, normalized size = 3.72

$$-\frac{2\,Ab^{2}c^{2}-4\,Aabcd+2\,Aa^{2}d^{2}-2\left(Bb^{2}cd-Babd^{2}\right)nx-\left(3\,Bb^{2}c^{2}-4\,Babcd+Ba^{2}d^{2}\right)n+2\left(Bb^{2}c^{2}-2\,Babcd+Ba^{2}d^{2}\right)\mathrm{lo}}{4\left(\left(b^{2}c^{2}d^{3}-2\,abcd^{4}+a^{2}d^{5}\right)g^{3}x^{2}+2\left(b^{2}c^{3}d^{2}-2\,abc^{2}d^{3}+a^{2}cd^{4}\right)g^{3}x+\left(b^{2}c^{4}d\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x, algorithm="fric
as")
```

```
[Out] -1/4*(2*A*b^2*c^2 - 4*A*a*b*c*d + 2*A*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2)*n
*x - (3*B*b^2*c^2 - 4*B*a*b*c*d + B*a^2*d^2)*n + 2*(B*b^2*c^2 - 2*B*a*b*c*d
 + B*a^2*d^2)*log(e) - 2*(B*b^2*d^2*n*x^2 + 2*B*b^2*c*d*n*x + (2*B*a*b*c*d
- B*a^2*d^2)*n)*log((b*x + a)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2
*d^5)*g^3*x^2 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*g^3*x + (b^2*c^
4*d - 2*a*b*c^3*d^2 + a^2*c^2*d^3)*g^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*g*x+c*g)**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.40003, size = 351, normalized size = 2.32

$$\frac{Bb^2n\log(bx+a)}{2\left(b^2c^2dg^3-2\,abcd^2g^3+a^2d^3g^3\right)}-\frac{Bb^2n\log(dx+c)}{2\left(b^2c^2dg^3-2\,abcd^2g^3+a^2d^3g^3\right)}-\frac{Bn\log\left(\frac{bx+a}{dx+c}\right)}{2\left(d^3g^3x^2+2\,cd^2g^3x+c^2dg^3\right)}+\frac{2\,Bbdnx}{4\left(bcd^3g^3x^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^3,x, algorithm="giac
")
```

```
[Out] 1/2*B*b^2*n*log(b*x + a)/(b^2*c^2*d*g^3 - 2*a*b*c*d^2*g^3 + a^2*d^3*g^3) -
1/2*B*b^2*n*log(d*x + c)/(b^2*c^2*d*g^3 - 2*a*b*c*d^2*g^3 + a^2*d^3*g^3) -
1/2*B*n*log((b*x + a)/(d*x + c))/(d^3*g^3*x^2 + 2*c*d^2*g^3*x + c^2*d*g^3)
+ 1/4*(2*B*b*d*n*x + 3*B*b*c*n - B*a*d*n - 2*A*b*c - 2*B*b*c + 2*A*a*d + 2*
B*a*d)/(b*c*d^3*g^3*x^2 - a*d^4*g^3*x^2 + 2*b*c^2*d^2*g^3*x - 2*a*c*d^3*g^3
*x + b*c^3*d*g^3 - a*c^2*d^2*g^3)
```

3.36 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^4}\,dx$

Optimal. Leaf size=183

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3dg^4(c+dx)^3}+\frac{b^2Bn}{3dg^4(c+dx)(bc-ad)^2}+\frac{b^3Bn\log(a+bx)}{3dg^4(bc-ad)^3}-\frac{b^3Bn\log(c+dx)}{3dg^4(bc-ad)^3}+\frac{bBn}{6dg^4(c+dx)^2(bc-ad)}+\frac{\ }{9d\cdots}$$

```
[Out] (B*n)/(9*d*g^4*(c + d*x)^3) + (b*B*n)/(6*d*(b*c - a*d)*g^4*(c + d*x)^2) + (
b^2*B*n)/(3*d*(b*c - a*d)^2*g^4*(c + d*x)) + (b^3*B*n*Log[a + b*x])/(3*d*(b
*c - a*d)^3*g^4) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(3*d*g^4*(c + d*x
)^3) - (b^3*B*n*Log[c + d*x])/(3*d*(b*c - a*d)^3*g^4)
```

Rubi [A] time = 0.143203, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3dg^4(c+dx)^3}+\frac{b^2Bn}{3dg^4(c+dx)(bc-ad)^2}+\frac{b^3Bn\log(a+bx)}{3dg^4(bc-ad)^3}-\frac{b^3Bn\log(c+dx)}{3dg^4(bc-ad)^3}+\frac{bBn}{6dg^4(c+dx)^2(bc-ad)}+\frac{\ }{9d\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^4,x]
```

```
[Out] (B*n)/(9*d*g^4*(c + d*x)^3) + (b*B*n)/(6*d*(b*c - a*d)*g^4*(c + d*x)^2) + (
b^2*B*n)/(3*d*(b*c - a*d)^2*g^4*(c + d*x)) + (b^3*B*n*Log[a + b*x])/(3*d*(b
*c - a*d)^3*g^4) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(3*d*g^4*(c + d*x
)^3) - (b^3*B*n*Log[c + d*x])/(3*d*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^4}\,dx=-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3dg^4(c+dx)^3}+\frac{(Bn)\int\frac{bc-ad}{g^3(a+bx)(c+dx)^4}\,dx}{3dg}$$

$$=-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3dg^4(c+dx)^3}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)^4}\,dx}{3dg^4}$$

$$=-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3dg^4(c+dx)^3}+\frac{(B(bc-ad)n)\int\left(\frac{b^4}{(bc-ad)^4(a+bx)}-\frac{d}{(bc-ad)(c+dx)^4}-\frac{bd}{(bc-ad)^2(c+dx)^3}-\right.}{3dg^4}$$

$$=\frac{Bn}{9dg^4(c+dx)^3}+\frac{bBn}{6d(bc-ad)g^4(c+dx)^2}+\frac{b^2Bn}{3d(bc-ad)^2g^4(c+dx)}+\frac{b^3Bn\log(a+bx)}{3d(bc-ad)^3g^4}-$$

Mathematica [A] time = 0.176667, size = 146, normalized size = 0.8

$$\frac{\frac{Bn\left((bc-ad)\left(2a^2d^2-abd(7c+3dx)+b^2\left(11c^2+15cdx+6d^2x^2\right)\right)+6b^3(c+dx)^3\log(a+bx)-6b^3(c+dx)^3\log(c+dx)\right)}{(bc-ad)^3}-6\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{18dg^4(c+dx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^4,x]
```

```
[Out] (-6*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*n*((b*c - a*d)*(2*a^2*d^2 -
 a*b*d*(7*c + 3*d*x) + b^2*(11*c^2 + 15*c*d*x + 6*d^2*x^2)) + 6*b^3*(c + d*
x)^3*Log[a + b*x] - 6*b^3*(c + d*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(18*d*g
```

```
^4*(c + d*x)^3)
```

Maple [F] time = 0.449, size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)^4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x)
```

Maxima [B] time = 1.25888, size = 585, normalized size = 3.2

$$\frac{1}{18}Bn\left(\frac{6\,b^2d^2x^2+11\,b^2c^2-7\,abcd+2\,a^2d^2+3\left(5\,b^2cd-abd^2\right)x}{\left(b^2c^2d^4-2\,abcd^5+a^2d^6\right)g^4x^3+3\left(b^2c^3d^3-2\,abc^2d^4+a^2cd^5\right)g^4x^2+3\left(b^2c^4d^2-2\,abc^3d^3+a^2c^2d^4\right)g^4x+\left(b^2c^5d\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x, algorithm="maxi
ma")
```

```
[Out] 1/18*B*n*((6*b^2*d^2*x^2 + 11*b^2*c^2 - 7*a*b*c*d + 2*a^2*d^2 + 3*(5*b^2*c*
d - a*b*d^2)*x)/((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*g^4*x^3 + 3*(b^2*c^3
*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*g^4*x^2 + 3*(b^2*c^4*d^2 - 2*a*b*c^3*d^3
+ a^2*c^2*d^4)*g^4*x + (b^2*c^5*d - 2*a*b*c^4*d^2 + a^2*c^3*d^3)*g^4) + 6*b
^3*log(b*x + a)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4)*g^
4) - 6*b^3*log(d*x + c)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3
*d^4)*g^4)) - 1/3*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*g^4*x^3 + 3
*c*d^3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4) - 1/3*A/(d^4*g^4*x^3 + 3*c*d^
3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4)
```

Fricas [B] time = 0.9341, size = 990, normalized size = 5.41

$$-\frac{6\,Ab^3c^3-18\,Aab^2c^2d+18\,Aa^2bcd^2-6\,Aa^3d^3-6\left(Bb^3cd^2-Bab^2d^3\right)nx^2-3\left(5\,Bb^3c^2d-6\,Bab^2cd^2+Ba^2bd^3\right)nx-\left(11\right.}{18\left(\left(b^3c^3d^4-3\,ab^2c^2d^5+3\,a^2bcd^6-a^3d^7\right)g^4x^3+3\left(b^3c^4d^3-\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/18*(6*A*b^3*c^3 - 18*A*a*b^2*c^2*d + 18*A*a^2*b*c*d^2 - 6*A*a^3*d^3 - 6*
(B*b^3*c*d^2 - B*a*b^2*d^3)*n*x^2 - 3*(5*B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + B*
a^2*b*d^3)*n*x - (11*B*b^3*c^3 - 18*B*a*b^2*c^2*d + 9*B*a^2*b*c*d^2 - 2*B*a
^3*d^3)*n + 6*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2 - B*a^3*d^3)*l
og(e) - 6*(B*b^3*d^3*n*x^3 + 3*B*b^3*c*d^2*n*x^2 + 3*B*b^3*c^2*d*n*x + (3*B
*a*b^2*c^2*d - 3*B*a^2*b*c*d^2 + B*a^3*d^3)*n)*log((b*x + a)/(d*x + c)))/((
b^3*c^3*d^4 - 3*a*b^2*c^2*d^5 + 3*a^2*b*c*d^6 - a^3*d^7)*g^4*x^3 + 3*(b^3*c
^4*d^3 - 3*a*b^2*c^3*d^4 + 3*a^2*b*c^2*d^5 - a^3*c*d^6)*g^4*x^2 + 3*(b^3*c^
5*d^2 - 3*a*b^2*c^4*d^3 + 3*a^2*b*c^3*d^4 - a^3*c^2*d^5)*g^4*x + (b^3*c^6*d
 - 3*a*b^2*c^5*d^2 + 3*a^2*b*c^4*d^3 - a^3*c^3*d^4)*g^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*g*x+c*g)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.45879, size = 655, normalized size = 3.58

$$\frac{Bb^3n\log(bx+a)}{3\left(b^3c^3dg^4-3\,ab^2c^2d^2g^4+3\,a^2bcd^3g^4-a^3d^4g^4\right)}-\frac{Bb^3n\log(dx+c)}{3\left(b^3c^3dg^4-3\,ab^2c^2d^2g^4+3\,a^2bcd^3g^4-a^3d^4g^4\right)}-\frac{B}{3\left(d^4g^4x^3+3\,cd\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^4,x, algorithm="giac
")
```

```
[Out] 1/3*B*b^3*n*log(b*x + a)/(b^3*c^3*d*g^4 - 3*a*b^2*c^2*d^2*g^4 + 3*a^2*b*c*d
^3*g^4 - a^3*d^4*g^4) - 1/3*B*b^3*n*log(d*x + c)/(b^3*c^3*d*g^4 - 3*a*b^2*c
```

```
^2*d^2*g^4 + 3*a^2*b*c*d^3*g^4 - a^3*d^4*g^4) - 1/3*B*n*log((b*x + a)/(d*x
+ c))/(d^4*g^4*x^3 + 3*c*d^3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4) + 1/18*
(6*B*b^2*d^2*n*x^2 + 15*B*b^2*c*d*n*x - 3*B*a*b*d^2*n*x + 11*B*b^2*c^2*n -
7*B*a*b*c*d*n + 2*B*a^2*d^2*n - 6*A*b^2*c^2 - 6*B*b^2*c^2 + 12*A*a*b*c*d +
12*B*a*b*c*d - 6*A*a^2*d^2 - 6*B*a^2*d^2)/(b^2*c^2*d^4*g^4*x^3 - 2*a*b*c*d^
5*g^4*x^3 + a^2*d^6*g^4*x^3 + 3*b^2*c^3*d^3*g^4*x^2 - 6*a*b*c^2*d^4*g^4*x^2
 + 3*a^2*c*d^5*g^4*x^2 + 3*b^2*c^4*d^2*g^4*x - 6*a*b*c^3*d^3*g^4*x + 3*a^2*
c^2*d^4*g^4*x + b^2*c^5*d*g^4 - 2*a*b*c^4*d^2*g^4 + a^2*c^3*d^3*g^4)
```

3.37 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^5}\,dx$

Optimal. Leaf size=215

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4dg^5(c+dx)^4}+\frac{b^3Bn}{4dg^5(c+dx)(bc-ad)^3}+\frac{b^2Bn}{8dg^5(c+dx)^2(bc-ad)^2}+\frac{b^4Bn\log(a+bx)}{4dg^5(bc-ad)^4}-\frac{b^4Bn\log(c+dx)}{4dg^5(bc-ad)^4}+$$

```
[Out] (B*n)/(16*d*g^5*(c + d*x)^4) + (b*B*n)/(12*d*(b*c - a*d)*g^5*(c + d*x)^3) +
 (b^2*B*n)/(8*d*(b*c - a*d)^2*g^5*(c + d*x)^2) + (b^3*B*n)/(4*d*(b*c - a*d)
^3*g^5*(c + d*x)) + (b^4*B*n*Log[a + b*x])/(4*d*(b*c - a*d)^4*g^5) - (A + B
*Log[e*((a + b*x)/(c + d*x))^n])/(4*d*g^5*(c + d*x)^4) - (b^4*B*n*Log[c + d
*x])/(4*d*(b*c - a*d)^4*g^5)
```

Rubi [A] time = 0.175639, antiderivative size = 215, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{4dg^5(c+dx)^4}+\frac{b^3Bn}{4dg^5(c+dx)(bc-ad)^3}+\frac{b^2Bn}{8dg^5(c+dx)^2(bc-ad)^2}+\frac{b^4Bn\log(a+bx)}{4dg^5(bc-ad)^4}-\frac{b^4Bn\log(c+dx)}{4dg^5(bc-ad)^4}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^5,x]
```


```
[Out] (B*n)/(16*d*g^5*(c + d*x)^4) + (b*B*n)/(12*d*(b*c - a*d)*g^5*(c + d*x)^3) +
 (b^2*B*n)/(8*d*(b*c - a*d)^2*g^5*(c + d*x)^2) + (b^3*B*n)/(4*d*(b*c - a*d)
^3*g^5*(c + d*x)) + (b^4*B*n*Log[a + b*x])/(4*d*(b*c - a*d)^4*g^5) - (A + B
*Log[e*((a + b*x)/(c + d*x))^n])/(4*d*g^5*(c + d*x)^4) - (b^4*B*n*Log[c + d
*x])/(4*d*(b*c - a*d)^4*g^5)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(cg+dgx)^5}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4dg^5(c+dx)^4}+\frac{(Bn)\int\frac{bc-ad}{g^4(a+bx)(c+dx)^5}\,dx}{4dg}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4dg^5(c+dx)^4}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)^5}\,dx}{4dg^5}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4dg^5(c+dx)^4}+\frac{(B(bc-ad)n)\int\left(\frac{b^5}{(bc-ad)^5(a+bx)}-\frac{d}{(bc-ad)(c+dx)^5}-\frac{bd}{(bc-ad)^2(c+dx)^4}-\cdots\right.}{4dg^5}$$

$$= \frac{Bn}{16dg^5(c+dx)^4}+\frac{bBn}{12d(bc-ad)g^5(c+dx)^3}+\frac{b^2Bn}{8d(bc-ad)^2g^5(c+dx)^2}+\frac{b^3Bn}{4d(bc-ad)^3g^5(c\ \cdots}$$

Mathematica [A] time = 0.237246, size = 162, normalized size = 0.75

$$\frac{\frac{Bn\left(\frac{12b^3(bc-ad)}{c+dx}+\frac{6b^2(bc-ad)^2}{(c+dx)^2}+12b^4\log(a+bx)+\frac{4b(bc-ad)^3}{(c+dx)^3}+\frac{3(bc-ad)^4}{(c+dx)^4}-12b^4\log(c+dx)\right)}{12(bc-ad)^4}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{(c+dx)^4}}{4dg^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c*g + d*g*x)^5,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(c + d*x)^4) + (B*n*((3*(b*c - a*
d)^4)/(c + d*x)^4 + (4*b*(b*c - a*d)^3)/(c + d*x)^3 + (6*b^2*(b*c - a*d)^2)
/(c + d*x)^2 + (12*b^3*(b*c - a*d))/(c + d*x) + 12*b^4*Log[a + b*x] - 12*b^
4*Log[c + d*x]))/(12*(b*c - a*d)^4))/(4*d*g^5)
```

Maple [F] time = 0.455, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx + cg\right)^5}\left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x)
```

Maxima [B] time = 1.25488, size = 880, normalized size = 4.09

$$\frac{1}{48}Bn\left(\frac{12\,b^3d^3x^3 + 25\,b^3c^3 - 23\,ab^2c^2d + 13\,a^2bcd^2 - 3\,a}{\left(b^3c^3d^5 - 3\,ab^2c^2d^6 + 3\,a^2bcd^7 - a^3d^8\right)g^5x^4 + 4\left(b^3c^4d^4 - 3\,ab^2c^3d^5 + 3\,a^2bc^2d^6 - a^3cd^7\right)g^5x^3 + 6\left(b^3c^5d^3 - 3\,ab^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/48*B*n*((12*b^3*d^3*x^3 + 25*b^3*c^3 - 23*a*b^2*c^2*d + 13*a^2*b*c*d^2 -
3*a^3*d^3 + 6*(7*b^3*c*d^2 - a*b^2*d^3)*x^2 + 4*(13*b^3*c^2*d - 5*a*b^2*c*d
^2 + a^2*b*d^3)*x)/((b^3*c^3*d^5 - 3*a*b^2*c^2*d^6 + 3*a^2*b*c*d^7 - a^3*d^
8)*g^5*x^4 + 4*(b^3*c^4*d^4 - 3*a*b^2*c^3*d^5 + 3*a^2*b*c^2*d^6 - a^3*c*d^7
)*g^5*x^3 + 6*(b^3*c^5*d^3 - 3*a*b^2*c^4*d^4 + 3*a^2*b*c^3*d^5 - a^3*c^2*d^
6)*g^5*x^2 + 4*(b^3*c^6*d^2 - 3*a*b^2*c^5*d^3 + 3*a^2*b*c^4*d^4 - a^3*c^3*d
^5)*g^5*x + (b^3*c^7*d - 3*a*b^2*c^6*d^2 + 3*a^2*b*c^5*d^3 - a^3*c^4*d^4)*g
^5) + 12*b^4*log(b*x + a)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3
 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5) - 12*b^4*log(d*x + c)/((b^4*c^4*d - 4*a*b^
3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5)) - 1/4*B*log(
e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d
^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c^4*d*g^5) - 1/4*A/(d^5*g^5*x^4 + 4*c*d^4*g^
```

```
5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c^4*d*g^5)
```

Fricas [B] time = 0.999619, size = 1505, normalized size = 7.

$$-\frac{12\,Ab^4c^4 - 48\,Aab^3c^3d + 72\,Aa^2b^2c^2d^2 - 48\,Aa^3bcd^3 + 12\,Aa^4d^4 - 12\left(Bb^4cd^3 - Bab^3d^4\right)nx^3 - 6\left(7\,Bb^4c^2d^2 - 8\,Bab^3cd\right.}{48\left(\left(b^4c^4d^5 - 4\,ab^3c^3d^6 + 6\,a^2b^2c^2d^7 - 4\,a^3bcd^8\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/48*(12*A*b^4*c^4 - 48*A*a*b^3*c^3*d + 72*A*a^2*b^2*c^2*d^2 - 48*A*a^3*b*
c*d^3 + 12*A*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*n*x^3 - 6*(7*B*b^4*c^
2*d^2 - 8*B*a*b^3*c*d^3 + B*a^2*b^2*d^4)*n*x^2 - 4*(13*B*b^4*c^3*d - 18*B*a
*b^3*c^2*d^2 + 6*B*a^2*b^2*c*d^3 - B*a^3*b*d^4)*n*x - (25*B*b^4*c^4 - 48*B*
a*b^3*c^3*d + 36*B*a^2*b^2*c^2*d^2 - 16*B*a^3*b*c*d^3 + 3*B*a^4*d^4)*n + 12
*(B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B*a
^4*d^4)*log(e) - 12*(B*b^4*d^4*n*x^4 + 4*B*b^4*c*d^3*n*x^3 + 6*B*b^4*c^2*d^
2*n*x^2 + 4*B*b^4*c^3*d*n*x + (4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*
a^3*b*c*d^3 - B*a^4*d^4)*n)*log((b*x + a)/(d*x + c)))/((b^4*c^4*d^5 - 4*a*b
^3*c^3*d^6 + 6*a^2*b^2*c^2*d^7 - 4*a^3*b*c*d^8 + a^4*d^9)*g^5*x^4 + 4*(b^4*
c^5*d^4 - 4*a*b^3*c^4*d^5 + 6*a^2*b^2*c^3*d^6 - 4*a^3*b*c^2*d^7 + a^4*c*d^8
)*g^5*x^3 + 6*(b^4*c^6*d^3 - 4*a*b^3*c^5*d^4 + 6*a^2*b^2*c^4*d^5 - 4*a^3*b*
c^3*d^6 + a^4*c^2*d^7)*g^5*x^2 + 4*(b^4*c^7*d^2 - 4*a*b^3*c^6*d^3 + 6*a^2*b
^2*c^5*d^4 - 4*a^3*b*c^4*d^5 + a^4*c^3*d^6)*g^5*x + (b^4*c^8*d - 4*a*b^3*c^
7*d^2 + 6*a^2*b^2*c^6*d^3 - 4*a^3*b*c^5*d^4 + a^4*c^4*d^5)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(d*g*x+c*g)**5,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.34134, size = 1038, normalized size = 4.83

$$\frac{Bb^4n\log(bx+a)}{4\left(b^4c^4dg^5-4\,ab^3c^3d^2g^5+6\,a^2b^2c^2d^3g^5-4\,a^3bcd^4g^5+a^4d^5g^5\right)}-\frac{Bb^4n\log(dx+c)}{4\left(b^4c^4dg^5-4\,ab^3c^3d^2g^5+6\,a^2b^2c^2d^3g^5-4\,a^3bcd^4g^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(d*g*x+c*g)^5,x, algorithm="giac
")
```

```
[Out] 1/4*B*b^4*n*log(b*x + a)/(b^4*c^4*d*g^5 - 4*a*b^3*c^3*d^2*g^5 + 6*a^2*b^2*c
^2*d^3*g^5 - 4*a^3*b*c*d^4*g^5 + a^4*d^5*g^5) - 1/4*B*b^4*n*log(d*x + c)/(b
^4*c^4*d*g^5 - 4*a*b^3*c^3*d^2*g^5 + 6*a^2*b^2*c^2*d^3*g^5 - 4*a^3*b*c*d^4*
g^5 + a^4*d^5*g^5) - 1/4*B*n*log((b*x + a)/(d*x + c))/(d^5*g^5*x^4 + 4*c*d^
4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c^4*d*g^5) + 1/48*(12*B*b
^3*d^3*n*x^3 + 42*B*b^3*c*d^2*n*x^2 - 6*B*a*b^2*d^3*n*x^2 + 52*B*b^3*c^2*d*
n*x - 20*B*a*b^2*c*d^2*n*x + 4*B*a^2*b*d^3*n*x + 25*B*b^3*c^3*n - 23*B*a*b^
2*c^2*d*n + 13*B*a^2*b*c*d^2*n - 3*B*a^3*d^3*n - 12*A*b^3*c^3 - 12*B*b^3*c^
3 + 36*A*a*b^2*c^2*d + 36*B*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 36*B*a^2*b*c*d
^2 + 12*A*a^3*d^3 + 12*B*a^3*d^3)/(b^3*c^3*d^5*g^5*x^4 - 3*a*b^2*c^2*d^6*g^
5*x^4 + 3*a^2*b*c*d^7*g^5*x^4 - a^3*d^8*g^5*x^4 + 4*b^3*c^4*d^4*g^5*x^3 - 1
2*a*b^2*c^3*d^5*g^5*x^3 + 12*a^2*b*c^2*d^6*g^5*x^3 - 4*a^3*c*d^7*g^5*x^3 +
6*b^3*c^5*d^3*g^5*x^2 - 18*a*b^2*c^4*d^4*g^5*x^2 + 18*a^2*b*c^3*d^5*g^5*x^2
 - 6*a^3*c^2*d^6*g^5*x^2 + 4*b^3*c^6*d^2*g^5*x - 12*a*b^2*c^5*d^3*g^5*x + 1
2*a^2*b*c^4*d^4*g^5*x - 4*a^3*c^3*d^5*g^5*x + b^3*c^7*d*g^5 - 3*a*b^2*c^6*d
^2*g^5 + 3*a^2*b*c^5*d^3*g^5 - a^3*c^4*d^4*g^5)
```

3.38 $\int (cg+dgx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=544

$$-\frac{2B^2g^4n^2(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{5b^5d}+\frac{2Bg^4n(bc-ad)^5\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^5d}-\frac{2Bg^4n(a+bx)(b}{}$$

```
[Out] (13*B^2*(b*c - a*d)^4*g^4*n^2*x)/(30*b^4) + (7*B^2*(b*c - a*d)^3*g^4*n^2*(c
 + d*x)^2)/(60*b^3*d) + (B^2*(b*c - a*d)^2*g^4*n^2*(c + d*x)^3)/(30*b^2*d)
- (2*B*(b*c - a*d)^4*g^4*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(5*b^5) - (B*(b*c - a*d)^3*g^4*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(5*b^3*d) - (2*B*(b*c - a*d)^2*g^4*n*(c + d*x)^3*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(15*b^2*d) - (B*(b*c - a*d)*g^4*n*(c + d*x)^4*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b*d) + (g^4*(c + d*x)^5*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])^2)/(5*d) + (13*B^2*(b*c - a*d)^5*g^4*n^2*Log[(
a + b*x)/(c + d*x)])/(30*b^5*d) + (5*B^2*(b*c - a*d)^5*g^4*n^2*Log[c + d*x]
)/(6*b^5*d) + (2*B*(b*c - a*d)^5*g^4*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(5*b^5*d) - (2*B^2*(b*c - a*d)^5*g
^4*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(5*b^5*d)
```

Rubi [A] time = 0.880468, antiderivative size = 634, normalized size of antiderivative = 1.17, number of steps used = 27, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{2B^2g^4n^2(bc-ad)^5\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{5b^5d}-\frac{2Bg^4n(bc-ad)^5\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{5b^5d}-\frac{Bg^4n(c+dx)^2(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^4*g^4*n*x)/(5*b^4) + (13*B^2*(b*c - a*d)^4*g^4*n^2*x)/(
30*b^4) + (7*B^2*(b*c - a*d)^3*g^4*n^2*(c + d*x)^2)/(60*b^3*d) + (B^2*(b*c
- a*d)^2*g^4*n^2*(c + d*x)^3)/(30*b^2*d) + (13*B^2*(b*c - a*d)^5*g^4*n^2*Lo
g[a + b*x])/(30*b^5*d) + (B^2*(b*c - a*d)^5*g^4*n^2*Log[a + b*x]^2)/(5*b^5*
d) - (2*B^2*(b*c - a*d)^4*g^4*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
5*b^5) - (B*(b*c - a*d)^3*g^4*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
```

```
x))^n]))/(5*b^3*d) - (2*B*(b*c - a*d)^2*g^4*n*(c + d*x)^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(15*b^2*d) - (B*(b*c - a*d)*g^4*n*(c + d*x)^4*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]))/(10*b*d) - (2*B*(b*c - a*d)^5*g^4*n*Log[a
 + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*b^5*d) + (g^4*(c + d*x)^
5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(5*d) + (2*B^2*(b*c - a*d)^5*g^
4*n^2*Log[c + d*x])/(5*b^5*d) - (2*B^2*(b*c - a*d)^5*g^4*n^2*Log[a + b*x]*L
og[(b*(c + d*x))/(b*c - a*d)])/(5*b^5*d) - (2*B^2*(b*c - a*d)^5*g^4*n^2*Pol
yLog[2, -((d*(a + b*x))/(b*c - a*d))])/(5*b^5*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (cg+dgx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d} - \frac{(2Bn)\int \frac{(bc-ad)g^5(c+dx)^4\left(A+B\log\left(e\left(\right.\right.\right.}{a+bx}}{5dg}$$

$$= \frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d} - \frac{\left(2B(bc-ad)g^4n\right)\int \frac{(c+dx)^4\left(A+B\,\mathrm{l}\right.}{a+}}{5d}$$

$$= \frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d} - \frac{\left(2B(bc-ad)g^4n\right)\int\left(\frac{d(bc-ad)^3\left(A+\right.}{}\right.}{}$$

$$= \frac{g^4(c+dx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{5d} - \frac{\left(2B(bc-ad)g^4n\right)\int(c+dx)^3\left(A\right.}{5b}$$

$$= -\frac{2AB(bc-ad)^4g^4nx}{5b^4} - \frac{B(bc-ad)^3g^4n(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{5b^3d}$$

$$= -\frac{2AB(bc-ad)^4g^4nx}{5b^4} - \frac{2B^2(bc-ad)^4g^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{5b^5} - \frac{B(b}{}$$

$$= -\frac{2AB(bc-ad)^4g^4nx}{5b^4} - \frac{2B^2(bc-ad)^4g^4n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{5b^5} - \frac{B(b}{}$$

$$= -\frac{2AB(bc-ad)^4g^4nx}{5b^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30b^4} + \frac{7B^2(bc-ad)^3g^4n^2(c+}{60b^3d}$$

$$= -\frac{2AB(bc-ad)^4g^4nx}{5b^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30b^4} + \frac{7B^2(bc-ad)^3g^4n^2(c+}{60b^3d}$$

$$= -\frac{2AB(bc-ad)^4g^4nx}{5b^4} + \frac{13B^2(bc-ad)^4g^4n^2x}{30b^4} + \frac{7B^2(bc-ad)^3g^4n^2(c+}{60b^3d}$$

Mathematica [A] time = 0.504332, size = 533, normalized size = 0.98

$$g^4\left((c+dx)^5\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2-\frac{Bn(bc-ad)\left(-12Bn(bc-ad)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+12b^2(c+dx)^2(bc\cdots}{\cdots}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^4*((c + d*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(24*A*b*d*(b*c - a*d)^3*x - 12*B*(b*c - a*d)^3*n*(b*d*x + (b*c - a*d)*Lo
g[a + b*x]) - 4*B*(b*c - a*d)^2*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 +
2*(b*c - a*d)^2*Log[a + b*x]) - B*(b*c - a*d)*n*(6*b*d*(b*c - a*d)^2*x + 3*
b^2*(b*c - a*d)*(c + d*x)^2 + 2*b^3*(c + d*x)^3 + 6*(b*c - a*d)^3*Log[a + b
*x]) + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + 12*b
^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 8*b^3
*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*b^4*(c
+ d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 24*(b*c - a*d)^4*Log[a +
b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 24*B*(b*c - a*d)^4*n*Log[c +
d*x] - 12*B*(b*c - a*d)^4*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x
))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/(12*b^5)))
/(5*d)
```

Maple [F] time = 0.441, size = 0, normalized size = 0.

$$\int \left(dgx+cg\right)^4\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*g*x+c*g)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.79233, size = 3888, normalized size = 7.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/5*A*B*d^4*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A^2*d^4*g^
4*x^5 + 2*A*B*c*d^3*g^4*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*
d^3*g^4*x^4 + 4*A*B*c^2*d^2*g^4*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)
+ 2*A^2*c^2*d^2*g^4*x^3 + 4*A*B*c^3*d*g^4*x^2*log(e*(b*x/(d*x + c) + a/(d*x
 + c))^n) + 2*A^2*c^3*d*g^4*x^2 + 1/30*A*B*d^4*g^4*n*(12*a^5*log(b*x + a)/b
^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*
d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*
d^4)*x)/(b^4*d^4)) - 1/3*A*B*c*d^3*g^4*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*lo
g(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + 2*A*B*c^2*d^2*g^4*n*(2*a^3*log
(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*
c^2 - a^2*d^2)*x)/(b^2*d^2)) - 4*A*B*c^3*d*g^4*n*(a^2*log(b*x + a)/b^2 - c^
2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*c^4*g^4*n*(a*log(b*x + a)
/b - c*log(d*x + c)/d) + 2*A*B*c^4*g^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c)
)^n) + A^2*c^4*g^4*x - 1/30*(77*a*b^3*c^4*d*g^4*n^2 - 94*a^2*b^2*c^3*d^2*g^
4*n^2 + 54*a^3*b*c^2*d^3*g^4*n^2 - 12*a^4*c*d^4*g^4*n^2 - (25*g^4*n^2 - 12*
g^4*n*log(e))*b^4*c^5)*B^2*log(d*x + c)/(b^4*d) - 2/5*(b^5*c^5*g^4*n^2 - 5*
a*b^4*c^4*d*g^4*n^2 + 10*a^2*b^3*c^3*d^2*g^4*n^2 - 10*a^3*b^2*c^2*d^3*g^4*n
^2 + 5*a^4*b*c*d^4*g^4*n^2 - a^5*d^5*g^4*n^2)*(log(b*x + a)*log((b*d*x + a*
d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^5*d) + 1/60
*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 + 24*B^2*b^5*c^5*g^4*n^2*log(b*x + a)*log
(d*x + c) - 12*B^2*b^5*c^5*g^4*n^2*log(d*x + c)^2 + 6*(a*b^4*d^5*g^4*n*log(
e) - (g^4*n*log(e) - 10*g^4*log(e)^2)*b^5*c*d^4)*B^2*x^4 + 2*((g^4*n^2 - 16
*g^4*n*log(e) + 60*g^4*log(e)^2)*b^5*c^2*d^3 - 2*(g^4*n^2 - 10*g^4*n*log(e)
)*a*b^4*c*d^4 + (g^4*n^2 - 4*g^4*n*log(e))*a^2*b^3*d^5)*B^2*x^3 + ((13*g^4*
n^2 - 72*g^4*n*log(e) + 120*g^4*log(e)^2)*b^5*c^3*d^2 - 3*(11*g^4*n^2 - 40*
g^4*n*log(e))*a*b^4*c^2*d^3 + 3*(9*g^4*n^2 - 20*g^4*n*log(e))*a^2*b^3*c*d^4
 - (7*g^4*n^2 - 12*g^4*n*log(e))*a^3*b^2*d^5)*B^2*x^2 - 12*(5*a*b^4*c^4*d*g
^4*n^2 - 10*a^2*b^3*c^3*d^2*g^4*n^2 + 10*a^3*b^2*c^2*d^3*g^4*n^2 - 5*a^4*b*
c*d^4*g^4*n^2 + a^5*d^5*g^4*n^2)*B^2*log(b*x + a)^2 + 2*((23*g^4*n^2 - 48*g
^4*n*log(e) + 30*g^4*log(e)^2)*b^5*c^4*d - (79*g^4*n^2 - 120*g^4*n*log(e))*
a*b^4*c^3*d^2 + 6*(17*g^4*n^2 - 20*g^4*n*log(e))*a^2*b^3*c^2*d^3 - (59*g^4*
n^2 - 60*g^4*n*log(e))*a^3*b^2*c*d^4 + (13*g^4*n^2 - 12*g^4*n*log(e))*a^4*b
*d^5)*B^2*x - 2*(12*(4*g^4*n^2 - 5*g^4*n*log(e))*a*b^4*c^4*d - 12*(13*g^4*n
^2 - 10*g^4*n*log(e))*a^2*b^3*c^3*d^2 + 4*(49*g^4*n^2 - 30*g^4*n*log(e))*a^
3*b^2*c^2*d^3 - (113*g^4*n^2 - 60*g^4*n*log(e))*a^4*b*c*d^4 + (25*g^4*n^2 -
 12*g^4*n*log(e))*a^5*d^5)*B^2*log(b*x + a) + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B
^2*b^5*c*d^4*g^4*x^4 + 10*B^2*b^5*c^2*d^3*g^4*x^3 + 10*B^2*b^5*c^3*d^2*g^4*
x^2 + 5*B^2*b^5*c^4*d*g^4*x)*log((b*x + a)^n)^2 + 12*(B^2*b^5*d^5*g^4*x^5 +
```

```
 5*B^2*b^5*c*d^4*g^4*x^4 + 10*B^2*b^5*c^2*d^3*g^4*x^3 + 10*B^2*b^5*c^3*d^2*
g^4*x^2 + 5*B^2*b^5*c^4*d*g^4*x)*log((d*x + c)^n)^2 + 2*(12*B^2*b^5*d^5*g^4
*x^5*log(e) - 12*B^2*b^5*c^5*g^4*n*log(d*x + c) + 3*(a*b^4*d^5*g^4*n - (g^4
*n - 20*g^4*log(e))*b^5*c*d^4)*B^2*x^4 + 4*(5*a*b^4*c*d^4*g^4*n - a^2*b^3*d
^5*g^4*n - 2*(2*g^4*n - 15*g^4*log(e))*b^5*c^2*d^3)*B^2*x^3 + 6*(10*a*b^4*c
^2*d^3*g^4*n - 5*a^2*b^3*c*d^4*g^4*n + a^3*b^2*d^5*g^4*n - 2*(3*g^4*n - 10*
g^4*log(e))*b^5*c^3*d^2)*B^2*x^2 + 12*(10*a*b^4*c^3*d^2*g^4*n - 10*a^2*b^3*
c^2*d^3*g^4*n + 5*a^3*b^2*c*d^4*g^4*n - a^4*b*d^5*g^4*n - (4*g^4*n - 5*g^4*
log(e))*b^5*c^4*d)*B^2*x + 12*(5*a*b^4*c^4*d*g^4*n - 10*a^2*b^3*c^3*d^2*g^4
*n + 10*a^3*b^2*c^2*d^3*g^4*n - 5*a^4*b*c*d^4*g^4*n + a^5*d^5*g^4*n)*B^2*lo
g(b*x + a))*log((b*x + a)^n) - 2*(12*B^2*b^5*d^5*g^4*x^5*log(e) - 12*B^2*b^
5*c^5*g^4*n*log(d*x + c) + 3*(a*b^4*d^5*g^4*n - (g^4*n - 20*g^4*log(e))*b^5
*c*d^4)*B^2*x^4 + 4*(5*a*b^4*c*d^4*g^4*n - a^2*b^3*d^5*g^4*n - 2*(2*g^4*n -
 15*g^4*log(e))*b^5*c^2*d^3)*B^2*x^3 + 6*(10*a*b^4*c^2*d^3*g^4*n - 5*a^2*b^
3*c*d^4*g^4*n + a^3*b^2*d^5*g^4*n - 2*(3*g^4*n - 10*g^4*log(e))*b^5*c^3*d^2
)*B^2*x^2 + 12*(10*a*b^4*c^3*d^2*g^4*n - 10*a^2*b^3*c^2*d^3*g^4*n + 5*a^3*b
^2*c*d^4*g^4*n - a^4*b*d^5*g^4*n - (4*g^4*n - 5*g^4*log(e))*b^5*c^4*d)*B^2*
x + 12*(5*a*b^4*c^4*d*g^4*n - 10*a^2*b^3*c^3*d^2*g^4*n + 10*a^3*b^2*c^2*d^3
*g^4*n - 5*a^4*b*c*d^4*g^4*n + a^5*d^5*g^4*n)*B^2*log(b*x + a) + 12*(B^2*b^
5*d^5*g^4*x^5 + 5*B^2*b^5*c*d^4*g^4*x^4 + 10*B^2*b^5*c^2*d^3*g^4*x^3 + 10*B
^2*b^5*c^3*d^2*g^4*x^2 + 5*B^2*b^5*c^4*d*g^4*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b^5*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2d^4g^4x^4 + 4\,A^2cd^3g^4x^3 + 6\,A^2c^2d^2g^4x^2 + 4\,A^2c^3dg^4x + A^2c^4g^4 + \left(B^2d^4g^4x^4 + 4\,B^2cd^3g^4x^3 + 6\,B^2c^2d^2g^4x^2 + \right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^4*g^4*x^4 + 4*A^2*c*d^3*g^4*x^3 + 6*A^2*c^2*d^2*g^4*x^2 + 4*
A^2*c^3*d*g^4*x + A^2*c^4*g^4 + (B^2*d^4*g^4*x^4 + 4*B^2*c*d^3*g^4*x^3 + 6*
B^2*c^2*d^2*g^4*x^2 + 4*B^2*c^3*d*g^4*x + B^2*c^4*g^4)*log(e*((b*x + a)/(d*
x + c))^n)^2 + 2*(A*B*d^4*g^4*x^4 + 4*A*B*c*d^3*g^4*x^3 + 6*A*B*c^2*d^2*g^4
*x^2 + 4*A*B*c^3*d*g^4*x + A*B*c^4*g^4)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**4*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dgx+cg)^4 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*g*x + c*g)^4*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.39 $\int (cg+dgx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=454

$$-\frac{B^2g^3n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{2b^4d}+\frac{Bg^3n(bc-ad)^4\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-\frac{Bg^3n(a+bx)(bc-\cdots}{\cdots}$$

```
[Out] (5*B^2*(b*c - a*d)^3*g^3*n^2*x)/(12*b^3) + (B^2*(b*c - a*d)^2*g^3*n^2*(c +
d*x)^2)/(12*b^2*d) - (B*(b*c - a*d)^3*g^3*n*(a + b*x)*(A + B*Log[e*((a + b*
x)/(c + d*x))^n]))/(2*b^4) - (B*(b*c - a*d)^2*g^3*n*(c + d*x)^2*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]))/(4*b^2*d) - (B*(b*c - a*d)*g^3*n*(c + d*x)^3*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) + (g^3*(c + d*x)^4*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/(4*d) + (5*B^2*(b*c - a*d)^4*g^3*n^2*Log[(
a + b*x)/(c + d*x)])/(12*b^4*d) + (11*B^2*(b*c - a*d)^4*g^3*n^2*Log[c + d*x
])/(12*b^4*d) + (B*(b*c - a*d)^4*g^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(2*b^4*d) - (B^2*(b*c - a*d)^4*g^3
*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(2*b^4*d)
```

Rubi [A] time = 0.684356, antiderivative size = 544, normalized size of antiderivative = 1.2, number of steps used = 23, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{B^2g^3n^2(bc-ad)^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2b^4d}-\frac{Bg^3n(bc-ad)^4\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2b^4d}-\frac{Bg^3n(c+dx)^2(bc-ad\cdots}{4\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*g^3*n*x)/(2*b^3) + (5*B^2*(b*c - a*d)^3*g^3*n^2*x)/(12*
b^3) + (B^2*(b*c - a*d)^2*g^3*n^2*(c + d*x)^2)/(12*b^2*d) + (5*B^2*(b*c - a
*d)^4*g^3*n^2*Log[a + b*x])/(12*b^4*d) + (B^2*(b*c - a*d)^4*g^3*n^2*Log[a +
 b*x]^2)/(4*b^4*d) - (B^2*(b*c - a*d)^3*g^3*n*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n])/(2*b^4) - (B*(b*c - a*d)^2*g^3*n*(c + d*x)^2*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(4*b^2*d) - (B*(b*c - a*d)*g^3*n*(c + d*x)^3*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) - (B*(b*c - a*d)^4*g^3*n*Log[a + b
*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*d) + (g^3*(c + d*x)^4*(A
```

```
 + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*d) + (B^2*(b*c - a*d)^4*g^3*n^2*
Log[c + d*x])/(2*b^4*d) - (B^2*(b*c - a*d)^4*g^3*n^2*Log[a + b*x]*Log[(b*(c
 + d*x))/(b*c - a*d)])/(2*b^4*d) - (B^2*(b*c - a*d)^4*g^3*n^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(2*b^4*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2dx = \frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{(Bn)\int\frac{(bc-ad)g^4(c+dx)^3\left(A+B\log\left(e\left(\ldots\right.\right.\right.}{a+bx}}{2dg}$$

$$= \frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{\left(B(bc-ad)g^3n\right)\int\frac{(c+dx)^3\left(A+B\log\right.}{a+b\ldots}}{2d}$$

$$= \frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{\left(B(bc-ad)g^3n\right)\int\left(\frac{d(bc-ad)^2\left(A+\ldots\right.}{\ldots}\right.}{\ldots}$$

$$= \frac{g^3(c+dx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4d} - \frac{\left(B(bc-ad)g^3n\right)\int(c+dx)^2\left(A\ldots\right.}{2b}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2b^3} - \frac{B(bc-ad)^2g^3n(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4b^2d}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2b^3} - \frac{B^2(bc-ad)^3g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2b^4} - \frac{B(bc\ldots}{}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2b^3} - \frac{B^2(bc-ad)^3g^3n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2b^4} - \frac{B(bc\ldots}{}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2b^3} + \frac{5B^2(bc-ad)^3g^3n^2x}{12b^3} + \frac{B^2(bc-ad)^2g^3n^2(c+dx)\ldots}{12b^2d}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2b^3} + \frac{5B^2(bc-ad)^3g^3n^2x}{12b^3} + \frac{B^2(bc-ad)^2g^3n^2(c+dx)\ldots}{12b^2d}$$

$$= -\frac{AB(bc-ad)^3g^3nx}{2b^3} + \frac{5B^2(bc-ad)^3g^3n^2x}{12b^3} + \frac{B^2(bc-ad)^2g^3n^2(c+dx)\ldots}{12b^2d}$$

Mathematica [A] time = 0.339475, size = 409, normalized size = 0.9

$$g^3\left((c+dx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2-\frac{Bn(bc-ad)\left(-3Bn(bc-ad)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+3b^2(c+dx)^2(bc-}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^3*((c + d*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(6*A*b*d*(b*c - a*d)^2*x - 3*B*(b*c - a*d)^2*n*(b*d*x + (b*c - a*d)*Log[
a + b*x]) - B*(b*c - a*d)*n*(2*b*d*(b*c - a*d)*x + b^2*(c + d*x)^2 + 2*(b*c
 - a*d)^2*Log[a + b*x]) + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[e*((a + b*x)/(c
 + d*x))^n] + 3*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]) + 2*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 6*(b*c
 - a*d)^3*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c -
a*d)^3*n*Log[c + d*x] - 3*B*(b*c - a*d)^3*n*(Log[a + b*x]*(Log[a + b*x] - 2
*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)])))/(3*b^4)))/(4*d)
```

Maple [F] time = 0.429, size = 0, normalized size = 0.

$$\int\left(dgx+cg\right)^3\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*g*x+c*g)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.63244, size = 2874, normalized size = 6.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*d^3*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*d^3*g^
3*x^4 + 2*A*B*c*d^2*g^3*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*
d^2*g^3*x^3 + 3*A*B*c^2*d*g^3*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) +
3/2*A^2*c^2*d*g^3*x^2 - 1/12*A*B*d^3*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*
log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^
3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + A*B*c*d^2*g^3*n*(2*a^3*log(b
*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^
2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A*B*c^2*d*g^3*n*(a^2*log(b*x + a)/b^2 - c^2*
log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*c^3*g^3*n*(a*log(b*x + a)/b
 - c*log(d*x + c)/d) + 2*A*B*c^3*g^3*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n) + A^2*c^3*g^3*x - 1/12*(26*a*b^2*c^3*d*g^3*n^2 - 21*a^2*b*c^2*d^2*g^3*n^
2 + 6*a^3*c*d^3*g^3*n^2 - (11*g^3*n^2 - 6*g^3*n*log(e))*b^3*c^4)*B^2*log(d*
x + c)/(b^3*d) - 1/2*(b^4*c^4*g^3*n^2 - 4*a*b^3*c^3*d*g^3*n^2 + 6*a^2*b^2*c
^2*d^2*g^3*n^2 - 4*a^3*b*c*d^3*g^3*n^2 + a^4*d^4*g^3*n^2)*(log(b*x + a)*log
((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b
^4*d) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 6*B^2*b^4*c^4*g^3*n^2*log(b*
x + a)*log(d*x + c) - 3*B^2*b^4*c^4*g^3*n^2*log(d*x + c)^2 + 2*(a*b^3*d^4*g
^3*n*log(e) - (g^3*n*log(e) - 6*g^3*log(e)^2)*b^4*c*d^3)*B^2*x^3 + ((g^3*n^
2 - 9*g^3*n*log(e) + 18*g^3*log(e)^2)*b^4*c^2*d^2 - 2*(g^3*n^2 - 6*g^3*n*lo
g(e))*a*b^3*c*d^3 + (g^3*n^2 - 3*g^3*n*log(e))*a^2*b^2*d^4)*B^2*x^2 - 3*(4*
a*b^3*c^3*d*g^3*n^2 - 6*a^2*b^2*c^2*d^2*g^3*n^2 + 4*a^3*b*c*d^3*g^3*n^2 - a
^4*d^4*g^3*n^2)*B^2*log(b*x + a)^2 + ((7*g^3*n^2 - 18*g^3*n*log(e) + 12*g^3
*log(e)^2)*b^4*c^3*d - (19*g^3*n^2 - 36*g^3*n*log(e))*a*b^3*c^2*d^2 + (17*g
^3*n^2 - 24*g^3*n*log(e))*a^2*b^2*c*d^3 - (5*g^3*n^2 - 6*g^3*n*log(e))*a^3*
b*d^4)*B^2*x - (6*(3*g^3*n^2 - 4*g^3*n*log(e))*a*b^3*c^3*d - 9*(5*g^3*n^2 -
 4*g^3*n*log(e))*a^2*b^2*c^2*d^2 + 2*(19*g^3*n^2 - 12*g^3*n*log(e))*a^3*b*c
*d^3 - (11*g^3*n^2 - 6*g^3*n*log(e))*a^4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4
*d^4*g^3*x^4 + 4*B^2*b^4*c*d^3*g^3*x^3 + 6*B^2*b^4*c^2*d^2*g^3*x^2 + 4*B^2*
b^4*c^3*d*g^3*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*c*
d^3*g^3*x^3 + 6*B^2*b^4*c^2*d^2*g^3*x^2 + 4*B^2*b^4*c^3*d*g^3*x)*log((d*x +
 c)^n)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) - 6*B^2*b^4*c^4*g^3*n*log(d*x + c)
 + 2*(a*b^3*d^4*g^3*n - (g^3*n - 12*g^3*log(e))*b^4*c*d^3)*B^2*x^3 + 3*(4*a
*b^3*c*d^3*g^3*n - a^2*b^2*d^4*g^3*n - 3*(g^3*n - 4*g^3*log(e))*b^4*c^2*d^2
)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*g^3*n - 4*a^2*b^2*c*d^3*g^3*n + a^3*b*d^4*g^
3*n - (3*g^3*n - 4*g^3*log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*c^3*d*g^3*n -
6*a^2*b^2*c^2*d^2*g^3*n + 4*a^3*b*c*d^3*g^3*n - a^4*d^4*g^3*n)*B^2*log(b*x
+ a))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g^3*x^4*log(e) - 6*B^2*b^4*c^4*g^3*
n*log(d*x + c) + 2*(a*b^3*d^4*g^3*n - (g^3*n - 12*g^3*log(e))*b^4*c*d^3)*B^
2*x^3 + 3*(4*a*b^3*c*d^3*g^3*n - a^2*b^2*d^4*g^3*n - 3*(g^3*n - 4*g^3*log(e
))*b^4*c^2*d^2)*B^2*x^2 + 6*(6*a*b^3*c^2*d^2*g^3*n - 4*a^2*b^2*c*d^3*g^3*n
+ a^3*b*d^4*g^3*n - (3*g^3*n - 4*g^3*log(e))*b^4*c^3*d)*B^2*x + 6*(4*a*b^3*
```

```
c^3*d*g^3*n - 6*a^2*b^2*c^2*d^2*g^3*n + 4*a^3*b*c*d^3*g^3*n - a^4*d^4*g^3*n
)*B^2*log(b*x + a) + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*c*d^3*g^3*x^3 + 6*B
^2*b^4*c^2*d^2*g^3*x^2 + 4*B^2*b^4*c^3*d*g^3*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b^4*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2d^3g^3x^3 + 3\,A^2cd^2g^3x^2 + 3\,A^2c^2dg^3x + A^2c^3g^3 + \left(B^2d^3g^3x^3 + 3\,B^2cd^2g^3x^2 + 3\,B^2c^2dg^3x + B^2c^3g^3\right)\log\left(e\left(\frac{bx}{dx}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^3*g^3*x^3 + 3*A^2*c*d^2*g^3*x^2 + 3*A^2*c^2*d*g^3*x + A^2*c^
3*g^3 + (B^2*d^3*g^3*x^3 + 3*B^2*c*d^2*g^3*x^2 + 3*B^2*c^2*d*g^3*x + B^2*c^
3*g^3)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*d^3*g^3*x^3 + 3*A*B*c*d^2*
g^3*x^2 + 3*A*B*c^2*d*g^3*x + A*B*c^3*g^3)*log(e*((b*x + a)/(d*x + c))^n),
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dgx + cg)^3 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*g*x + c*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.40 $\int (cg+dgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=361

$$-\frac{2B^2g^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{3b^3d}+\frac{2Bg^2n(bc-ad)^3\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2Bg^2n(a+bx)(b}{}$$

```
[Out] (B^2*(b*c - a*d)^2*g^2*n^2*x)/(3*b^2) - (2*B*(b*c - a*d)^2*g^2*n*(a + b*x)*
(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3) - (B*(b*c - a*d)*g^2*n*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*d) + (g^2*(c + d*x)^3*
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*d) + (B^2*(b*c - a*d)^3*g^2*n^
2*Log[(a + b*x)/(c + d*x)])/(3*b^3*d) + (B^2*(b*c - a*d)^3*g^2*n^2*Log[c +
d*x])/(b^3*d) + (2*B*(b*c - a*d)^3*g^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3
*g^2*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(3*b^3*d)
```

Rubi [A] time = 0.566623, antiderivative size = 454, normalized size of antiderivative = 1.26, number of steps used = 19, number of rules used = 13, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.371, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 43}

$$-\frac{2B^2g^2n^2(bc-ad)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3d}-\frac{2Bg^2n(bc-ad)^3\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3b^3d}-\frac{2ABg^2nx(bc-ad)^2}{3b^2}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^2*g^2*n*x)/(3*b^2) + (B^2*(b*c - a*d)^2*g^2*n^2*x)/(3*b
^2) + (B^2*(b*c - a*d)^3*g^2*n^2*Log[a + b*x])/(3*b^3*d) + (B^2*(b*c - a*d)
^3*g^2*n^2*Log[a + b*x]^2)/(3*b^3*d) - (2*B^2*(b*c - a*d)^2*g^2*n*(a + b*x)
*Log[e*((a + b*x)/(c + d*x))^n])/(3*b^3) - (B*(b*c - a*d)*g^2*n*(c + d*x)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b*d) - (2*B*(b*c - a*d)^3*g^2*n
*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3*d) + (g^2*(c +
 d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*d) + (2*B^2*(b*c - a*d
)^3*g^2*n^2*Log[c + d*x])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*g^2*n^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*d) - (2*B^2*(b*c - a*d)^3*g^2*n
^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (cg+dgx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{(2Bn)\int \frac{(bc-ad)g^3(c+dx)^2\left(A+B\log\left(e\left(\right.\right.\right.}{a+bx}}{3dg}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{\left(2B(bc-ad)g^2n\right)\int \frac{(c+dx)^2\left(A+B\,\mathrm{l}\right.}{a+}}{3d}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{\left(2B(bc-ad)g^2n\right)\int\left(\frac{d(bc-ad)\left(A+\right.}{}\right.}{}$$

$$= \frac{g^2(c+dx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3d} - \frac{\left(2B(bc-ad)g^2n\right)\int(c+dx)\left(A\right.}{3b}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} - \frac{B(bc-ad)g^2n(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3bd}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} - \frac{2B^2(bc-ad)^2g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3b^3} - \frac{B(b}{}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} - \frac{2B^2(bc-ad)^2g^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3b^3} - \frac{B(b}{}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2} + \frac{B^2(bc-ad)^3g^2n^2\log(a+}{3b^3d}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2} + \frac{B^2(bc-ad)^3g^2n^2\log(a+}{3b^3d}$$

$$= -\frac{2AB(bc-ad)^2g^2nx}{3b^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2} + \frac{B^2(bc-ad)^3g^2n^2\log(a+}{3b^3d}$$

Mathematica [A] time = 0.239755, size = 303, normalized size = 0.84

$$g^2\left((c+dx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn(bc-ad)\left(-Bn(bc-ad)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\,\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+b^2(c+dx)^2\left(B\log\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g^2*((c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*(b*c - a*d)
*n*(2*A*b*d*(b*c - a*d)*x - B*(b*c - a*d)*n*(b*d*x + (b*c - a*d)*Log[a + b*
x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c - a*d)^2*Log[a + b*
x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*B*(b*c - a*d)^2*n*Log[c + d*x
] - B*(b*c - a*d)^2*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*
c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])))/b^3))/(3*d)
```

Maple [F] time = 0.43, size = 0, normalized size = 0.

$$\int \left(dgx + cg\right)^{2} \left(A + B\ln\left(e\left(\frac{bx + a}{dx + c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*g*x+c*g)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.60364, size = 1989, normalized size = 5.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] 2/3*A*B*d^2*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*d^2*g^
2*x^3 + 2*A*B*c*d*g^2*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c*d*
g^2*x^2 + 1/3*A*B*d^2*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*
c*d*g^2*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d
)) + 2*A*B*c^2*g^2*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c^2*g^2*
x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*c^2*g^2*x - 1/3*(5*a*b*c^2*d
```

```
*g^2*n^2 - 2*a^2*c*d^2*g^2*n^2 - (3*g^2*n^2 - 2*g^2*n*log(e))*b^2*c^3)*B^2*
log(d*x + c)/(b^2*d) - 2/3*(b^3*c^3*g^2*n^2 - 3*a*b^2*c^2*d*g^2*n^2 + 3*a^2
*b*c*d^2*g^2*n^2 - a^3*d^3*g^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c -
a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d) + 1/3*(B^2*b^3*d
^3*g^2*x^3*log(e)^2 + 2*B^2*b^3*c^3*g^2*n^2*log(b*x + a)*log(d*x + c) - B^2
*b^3*c^3*g^2*n^2*log(d*x + c)^2 + (a*b^2*d^3*g^2*n*log(e) - (g^2*n*log(e) -
 3*g^2*log(e)^2)*b^3*c*d^2)*B^2*x^2 - (3*a*b^2*c^2*d*g^2*n^2 - 3*a^2*b*c*d^
2*g^2*n^2 + a^3*d^3*g^2*n^2)*B^2*log(b*x + a)^2 + ((g^2*n^2 - 4*g^2*n*log(e
) + 3*g^2*log(e)^2)*b^3*c^2*d - 2*(g^2*n^2 - 3*g^2*n*log(e))*a*b^2*c*d^2 +
(g^2*n^2 - 2*g^2*n*log(e))*a^2*b*d^3)*B^2*x - (2*(2*g^2*n^2 - 3*g^2*n*log(e
))*a*b^2*c^2*d - (7*g^2*n^2 - 6*g^2*n*log(e))*a^2*b*c*d^2 + (3*g^2*n^2 - 2*
g^2*n*log(e))*a^3*d^3)*B^2*log(b*x + a) + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*
c*d^2*g^2*x^2 + 3*B^2*b^3*c^2*d*g^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*g^
2*x^3 + 3*B^2*b^3*c*d^2*g^2*x^2 + 3*B^2*b^3*c^2*d*g^2*x)*log((d*x + c)^n)^2
 + (2*B^2*b^3*d^3*g^2*x^3*log(e) - 2*B^2*b^3*c^3*g^2*n*log(d*x + c) + (a*b^
2*d^3*g^2*n - (g^2*n - 6*g^2*log(e))*b^3*c*d^2)*B^2*x^2 + 2*(3*a*b^2*c*d^2*
g^2*n - a^2*b*d^3*g^2*n - (2*g^2*n - 3*g^2*log(e))*b^3*c^2*d)*B^2*x + 2*(3*
a*b^2*c^2*d*g^2*n - 3*a^2*b*c*d^2*g^2*n + a^3*d^3*g^2*n)*B^2*log(b*x + a))*
log((b*x + a)^n) - (2*B^2*b^3*d^3*g^2*x^3*log(e) - 2*B^2*b^3*c^3*g^2*n*log(
d*x + c) + (a*b^2*d^3*g^2*n - (g^2*n - 6*g^2*log(e))*b^3*c*d^2)*B^2*x^2 + 2
*(3*a*b^2*c*d^2*g^2*n - a^2*b*d^3*g^2*n - (2*g^2*n - 3*g^2*log(e))*b^3*c^2*
d)*B^2*x + 2*(3*a*b^2*c^2*d*g^2*n - 3*a^2*b*c*d^2*g^2*n + a^3*d^3*g^2*n)*B^
2*log(b*x + a) + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*c*d^2*g^2*x^2 + 3*B^2*b
^3*c^2*d*g^2*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(A^2d^2g^2x^2 + 2\,A^2cdg^2x + A^2c^2g^2 + \left(B^2d^2g^2x^2 + 2\,B^2cdg^2x + B^2c^2g^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABd^2g^2x^2 + 2\,A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*d^2*g^2*x^2 + 2*A^2*c*d*g^2*x + A^2*c^2*g^2 + (B^2*d^2*g^2*x^2
 + 2*B^2*c*d*g^2*x + B^2*c^2*g^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B
*d^2*g^2*x^2 + 2*A*B*c*d*g^2*x + A*B*c^2*g^2)*log(e*((b*x + a)/(d*x + c))^n
), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dgx + cg)^2 \left(B \log \left(e \left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*g*x + c*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.41 $\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=220

$$-\frac{B^2gn^2(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)}{b^2d}+\frac{Bgn(bc-ad)^2\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}-\frac{Bgn(a+bx)(bc-ad}{}$$

```
[Out] -((B*(b*c - a*d)*g*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/b^2)
 + (g*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d) + (B^2*(b
*c - a*d)^2*g*n^2*Log[c + d*x])/(b^2*d) + (B*(b*c - a*d)^2*g*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))])/(b^2*d) -
(B^2*(b*c - a*d)^2*g*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b^2*d)
```

Rubi [A] time = 0.422598, antiderivative size = 307, normalized size of antiderivative = 1.4, number of steps used = 15, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2gn^2(bc-ad)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2d}-\frac{Bgn(bc-ad)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b^2d}+\frac{g(c+dx)^2\left(B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*n*x)/b) + (B^2*(b*c - a*d)^2*g*n^2*Log[a + b*x]^2)/(2*
b^2*d) - (B^2*(b*c - a*d)*g*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b^2
 - (B*(b*c - a*d)^2*g*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])
)/(b^2*d) + (g*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*d)
+ (B^2*(b*c - a*d)^2*g*n^2*Log[c + d*x])/(b^2*d) - (B^2*(b*c - a*d)^2*g*n^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*d) - (B^2*(b*c - a*d)^2*
g*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*d)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(Bn)\int \frac{(bc-ad)g^2(c+dx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^{n}\right.\right.}{a+bx}}{dg}$$

$$= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(B(bc-ad)gn)\int \frac{(c+dx)\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{a+bx}}{d}$$

$$= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(B(bc-ad)gn)\int\left(\frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^{n}\right)\right.}{b}\right.}{d}$$

$$= \frac{g(c+dx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2d} - \frac{(B(bc-ad)gn)\int\left(A+B\log\left(e\left(\frac{a+b}{c+d}\right.\right.\right.}{b}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B(bc-ad)^2gn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2d} +$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{B(bc-ad)^2g}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{B(bc-ad)^2g}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2} - \frac{B(bc-ad)^2g}{}$$

$$= -\frac{AB(bc-ad)gnx}{b} + \frac{B^2(bc-ad)^2gn^2\log^2(a+bx)}{2b^2d} - \frac{B^2(bc-ad)gn(a+bx}{b^2}$$

$$= -\frac{AB(bc-ad)gnx}{b} + \frac{B^2(bc-ad)^2gn^2\log^2(a+bx)}{2b^2d} - \frac{B^2(bc-ad)gn(a+bx}{b^2}$$

Mathematica [A] time = 0.21219, size = 216, normalized size = 0.98

$$\frac{g\left(\frac{Bn(bc-ad)\left(2Bn(ad-bc)\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)-2(bc-ad)\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)-2\left(Bd(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+Bn(ad-bc)\log(c+dx)+\right.\right.}{b^2}\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (g*((c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*(b*c - a*d)*n
*(B*(b*c - a*d)*n*Log[a + b*x]^2 - 2*(A*b*d*x + B*d*(a + b*x)*Log[e*((a + b
*x)/(c + d*x))^n] + B*(-(b*c) + a*d)*n*Log[c + d*x]) - 2*(b*c - a*d)*Log[a
+ b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n*Log[(b*(c + d*x))/(b*c -
 a*d)]) + 2*B*(-(b*c) + a*d)*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]))/b
^2))/(2*d)
```

Maple [F] time = 0.277, size = 0, normalized size = 0.

$$\int (dgx+cg)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.54851, size = 1114, normalized size = 5.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] A*B*d*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*d*g*x^2 - A*B*
d*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) +
 2*A*B*c*g*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*c*g*x*log(e*(b*x
/(d*x + c) + a/(d*x + c))^n) + A^2*c*g*x - (a*c*d*g*n^2 - (g*n^2 - g*n*log(
e))*b*c^2)*B^2*log(d*x + c)/(b*d) - (b^2*c^2*g*n^2 - 2*a*b*c*d*g*n^2 + a^2*
d^2*g*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x
 + a*d)/(b*c - a*d)))*B^2/(b^2*d) + 1/2*(2*B^2*b^2*c^2*g*n^2*log(b*x + a)*l
og(d*x + c) - B^2*b^2*c^2*g*n^2*log(d*x + c)^2 + B^2*b^2*d^2*g*x^2*log(e)^2
```

```
 - (2*a*b*c*d*g*n^2 - a^2*d^2*g*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*g*n*lo
g(e) - (g*n*log(e) - g*log(e)^2)*b^2*c*d)*B^2*x - 2*((g*n^2 - 2*g*n*log(e))
*a*b*c*d - (g*n^2 - g*n*log(e))*a^2*d^2)*B^2*log(b*x + a) + (B^2*b^2*d^2*g*
x^2 + 2*B^2*b^2*c*d*g*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^
2*c*d*g*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*g*x^2*log(e) - B^2*b^2*c^2*g
*n*log(d*x + c) + (a*b*d^2*g*n - (g*n - 2*g*log(e))*b^2*c*d)*B^2*x + (2*a*b
*c*d*g*n - a^2*d^2*g*n)*B^2*log(b*x + a))*log((b*x + a)^n) - 2*(B^2*b^2*d^2
*g*x^2*log(e) - B^2*b^2*c^2*g*n*log(d*x + c) + (a*b*d^2*g*n - (g*n - 2*g*lo
g(e))*b^2*c*d)*B^2*x + (2*a*b*c*d*g*n - a^2*d^2*g*n)*B^2*log(b*x + a) + (B^
2*b^2*d^2*g*x^2 + 2*B^2*b^2*c*d*g*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b
^2*d)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2dgx + A^2cg + \left(B^2dgx + B^2cg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABdgx + ABcg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*d*g*x + A^2*c*g + (B^2*d*g*x + B^2*c*g)*log(e*((b*x + a)/(d*x
+ c))^n)^2 + 2*(A*B*d*g*x + A*B*c*g)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (dgx + cg)\left(B\log\left(e\left(\frac{bx + a}{dx + c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate((d*g*x + c*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.42 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{cg+dgx}\,dx$

Optimal. Leaf size=137

$$-\frac{2BnPolyLog\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg}+\frac{2B^2n^2PolyLog\left(3,\frac{d(a+bx)}{b(c+dx)}\right)}{dg}-\frac{\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{dg}$$

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])
/(d*g)) - (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*PolyLog[2, (d*(a +
b*x))/(b*(c + d*x))])/(d*g) + (2*B^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d
*x))])/(d*g)
```

Rubi [B] time = 3.30232, antiderivative size = 782, normalized size of antiderivative = 5.71, number of steps used = 45, number of rules used = 23, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.657, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2499, 2396, 2433, 2374, 6589, 2302, 30, 2500, 2375, 2317, 2440, 2434}

$$-\frac{2ABnPolyLog\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg}+\frac{2B^2nPolyLog\left(2,\frac{b(c+dx)}{bc-ad}\right)\left(-\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\log\left((a+bx)^n\right)+\log\left((c+dx)^{-n}\right)\right)}{dg}-\frac{2B^2n}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x),x]
```

```
[Out] (B^2*Log[(a + b*x)^n]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(d*g) - (B^2*Log[(a
 + b*x)^n]^2*Log[g*(c + d*x)])/(d*g) + (A*B*n*Log[g*(c + d*x)]^2)/(d*g) - (
B^2*n^2*Log[a + b*x]*Log[g*(c + d*x)]^2)/(d*g) + (B^2*n^2*Log[-((d*(a + b*x
))/(b*c - a*d))]*Log[g*(c + d*x)]^2)/(d*g) + (B^2*n^2*Log[g*(c + d*x)]^3)/(
3*d*g) - (2*B^2*n*Log[a + b*x]*Log[g*(c + d*x)]*Log[(c + d*x)^(-n)])/(d*g)
- (B^2*Log[a + b*x]*Log[(c + d*x)^(-n)]^2)/(d*g) + (B^2*Log[-((d*(a + b*x))
/(b*c - a*d))]*Log[(c + d*x)^(-n)]^2)/(d*g) - (2*A*B*n*Log[-((d*(a + b*x))/
(b*c - a*d))]*Log[c*g + d*g*x])/(d*g) + ((A + B*Log[e*((a + b*x)/(c + d*x))
^n])^2*Log[c*g + d*g*x])/(d*g) + (2*B^2*n*Log[-((d*(a + b*x))/(b*c - a*d))]
*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*
Log[c*g + d*g*x])/(d*g) - (B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c*
g + d*g*x]^2)/(d*g) + (B^2*n*Log[e*((a + b*x)/(c + d*x))^n]*Log[c*g + d*g*x
]^2)/(d*g) + (2*B^2*n*Log[(a + b*x)^n]*PolyLog[2, -((d*(a + b*x))/(b*c - a*
```

```
d))])/(d*g) - (2*A*B*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g) - (2*B^
2*n*Log[(c + d*x)^(-n)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g) + (2*B
^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n
)])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*g) - (2*B^2*n^2*PolyLog[3, -(
(d*(a + b*x))/(b*c - a*d))])/(d*g) - (2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(b
*c - a*d)])/(d*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
```

```
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
```

```
[b*c - a*d, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{cg+dgx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{a+bx}}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{(a+bx)(c+dx)}\,d}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2B(bc-ad)n)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dg}{(a+bx)(c+dx)}}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2B(bc-ad)n)\int \left(\frac{d\left(-A-B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg}{(bc-ad)(c+dx)}\right.}{dg}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \frac{\left(-A-B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(cg+dgx)}{c+dx}\,dx}{g} - $$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2Bn)\int \left(\frac{A\log(cg+dgx)}{-c-dx} + \frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\log(cg+}{-c-dx}\right.}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} - \frac{(2ABn)\int \frac{\log(cg+dgx)}{-c-dx}\,dx}{g} - \frac{\left(2B^2n\right)\int \frac{\log\left(e\left(\frac{a+}{c+}\right.\right.}{}}{}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} + \frac{B^2n}{}$$

$$= -\frac{2ABn\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(cg+dgx)}{dg} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(cg+dgx)}{dg} + \frac{2B^2}{}$$

$$= -\frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\log^2(g(c+dx))}{dg} - \frac{2B^2n\log(a+bx)\log(g(}{d}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\log^2(g(c}{dg}$$

$$= \frac{B^2\log^2\left((a+bx)^n\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{dg} - \frac{B^2\log^2\left((a+bx)^n\right)\log(g(c+dx))}{dg} + \frac{ABn\log^2(g(c}{dg}$$

Mathematica [B] time = 0.399526, size = 537, normalized size = 3.92

$$-3Bn\left(-2\left(\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+\log\left(\frac{a}{b}+x\right)\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)+2\log(c+dx)\left(-\log\left(\frac{a+bx}{c+dx}\right)+\log\left(\frac{a}{b}+x\right)-\log\left(\frac{c}{d}+x\right)\right)+$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x),x]
```

```
[Out] (3*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b*x)/(c + d*x)])^2*
Log[c + d*x] - 3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] - B*n*Log[(a + b
*x)/(c + d*x)])*(Log[c/d + x]^2 + 2*(Log[a/b + x] - Log[c/d + x] - Log[(a +
 b*x)/(c + d*x)])*Log[c + d*x] - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c - a
*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + B^2*n^2*(Log[c/d + x]^3
 + 3*Log[c/d + x]^2*(-Log[a/b + x] + Log[(d*(a + b*x))/(-(b*c) + a*d)]) + 3
*(-Log[a/b + x] + Log[c/d + x] + Log[(a + b*x)/(c + d*x)])^2*Log[c + d*x] +
 3*Log[a/b + x]^2*Log[(b*(c + d*x))/(b*c - a*d)] + 6*Log[a/b + x]*PolyLog[2
, (d*(a + b*x))/(-(b*c) + a*d)] + 3*(Log[a/b + x] - Log[c/d + x] - Log[(a +
 b*x)/(c + d*x)])*(Log[c/d + x]^2 - 2*(Log[a/b + x]*Log[(b*(c + d*x))/(b*c
- a*d)] + PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])) + 6*Log[c/d + x]*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)] - 6*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d
)] - 6*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]))/(3*d*g)
```

Maple [F] time = 0.444, size = 0, normalized size = 0.

$$\int\frac{1}{dgx+cg}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{B^{2}\log(dx+c)\log\left((dx+c)^{n}\right)^{2}}{dg}+\frac{A^{2}\log\left(dgx+cg\right)}{dg}-\int-\frac{B^{2}\log\left((bx+a)^{n}\right)^{2}+B^{2}\log(e)^{2}+2\,AB\log(e)+2\left(B^{2}\log(e)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x, algorithm="maxi
ma")
```

```
[Out] B^2*log(d*x + c)*log((d*x + c)^n)^2/(d*g) + A^2*log(d*g*x + c*g)/(d*g) - in
tegrate(-(B^2*log((b*x + a)^n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log
(e) + A*B)*log((b*x + a)^n) - 2*(B^2*n*log(d*x + c) + B^2*log((b*x + a)^n)
+ B^2*log(e) + A*B)*log((d*x + c)^n))/(d*g*x + c*g), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2}{dgx+cg},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(d*g*x + c*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{dgx+cg}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g),x, algorithm="giac
")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*g*x + c*g), x)
```

3.43 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^2}\,dx$

Optimal. Leaf size=163

$$\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^2(c+dx)(bc-ad)}-\frac{2ABn(a+bx)}{g^2(c+dx)(bc-ad)}-\frac{2B^2n(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g^2(c+dx)(bc-ad)}+\frac{2B^2n^2(a+bx)}{g^2(c+dx)(bc-ad)}$$

```
[Out] (-2*A*B*n*(a + b*x))/((b*c - a*d)*g^2*(c + d*x)) + (2*B^2*n^2*(a + b*x))/((
b*c - a*d)*g^2*(c + d*x)) - (2*B^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
n])/((b*c - a*d)*g^2*(c + d*x)) + ((a + b*x)*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])^2)/((b*c - a*d)*g^2*(c + d*x))
```

Rubi [C] time = 0.773967, antiderivative size = 514, normalized size of antiderivative = 3.15, number of steps used = 24, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2bB^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{dg^2(bc-ad)}+\frac{2bB^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg^2(bc-ad)}+\frac{2bBn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg^2(bc-ad)}+\frac{2Bn\left(B\log\right.}{dg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^2,x]
```

```
[Out] (-2*B^2*n^2)/(d*g^2*(c + d*x)) - (2*b*B^2*n^2*Log[a + b*x])/(d*(b*c - a*d)*
g^2) - (b*B^2*n^2*Log[a + b*x]^2)/(d*(b*c - a*d)*g^2) + (2*B*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(d*g^2*(c + d*x)) + (2*b*B*n*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(d*(b*c - a*d)*g^2) - (A + B*Log[e*((a +
 b*x)/(c + d*x))^n])^2/(d*g^2*(c + d*x)) + (2*b*B^2*n^2*Log[c + d*x])/(d*(b
*c - a*d)*g^2) + (2*b*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x
])/(d*(b*c - a*d)*g^2) - (2*b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Lo
g[c + d*x])/(d*(b*c - a*d)*g^2) - (b*B^2*n^2*Log[c + d*x]^2)/(d*(b*c - a*d)
*g^2) + (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(d*(b*c -
 a*d)*g^2) + (2*b*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(d*(b*c
 - a*d)*g^2) + (2*b*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d*(b*c
- a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^2}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(a+bx)(c+dx)^2}\,dx}{dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^2}\,dx}{dg^2}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} + \frac{(2B(bc-ad)n)\int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^2(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(c+dx)^2}\right.}{dg^2}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{dg^2(c+dx)} - \frac{(2Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^2}\,dx}{g^2} - \frac{(2bBn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,d}{(bc-ad)g^2}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^2} - \frac{\left(A+B\log\right.}{dg^2}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^2} - \frac{\left(A+B\log\right.}{dg^2}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^2} - \frac{\left(A+B\log\right.}{dg^2}$$

$$= -\frac{2B^2n^2}{dg^2(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{d(bc-ad)g^2} + \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{dg^2(c+dx)} + \frac{2bBn\log(a+bx}{d(}$$

$$= -\frac{2B^2n^2}{dg^2(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{d(bc-ad)g^2} - \frac{bB^2n^2\log^2(a+bx)}{d(bc-ad)g^2} + \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{dg^2(c+dx)}$$

$$= -\frac{2B^2n^2}{dg^2(c+dx)} - \frac{2bB^2n^2\log(a+bx)}{d(bc-ad)g^2} - \frac{bB^2n^2\log^2(a+bx)}{d(bc-ad)g^2} + \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{dg^2(c+dx)}$$

Mathematica [C] time = 0.446407, size = 331, normalized size = 2.03

$$Bn\left(-bBn(c+dx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBn(c+dx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2(bc\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^2,x]
```

```
[Out] (-(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 2*b*(c + d*x)*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 2*b*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x] - 2*B*n*(b*c - a*d + b*(c + d*x)*Log[a + b*x] - b*(c + d*x)*
Log[c + d*x]) - b*B*n*(c + d*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*n*
(c + d*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(d*g^2*(c + d*x
))
```

Maple [F] time = 0.441, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x)
```

Maxima [B] time = 1.26026, size = 578, normalized size = 3.55

$$2\,ABn\left(\frac{1}{d^{2}g^{2}x+cdg^{2}}+\frac{b\log\left(bx+a\right)}{\left(bcd-ad^{2}\right)g^{2}}-\frac{b\log\left(dx+c\right)}{\left(bcd-ad^{2}\right)g^{2}}\right)+\left(2\,n\left(\frac{1}{d^{2}g^{2}x+cdg^{2}}+\frac{b\log\left(bx+a\right)}{\left(bcd-ad^{2}\right)g^{2}}-\frac{b\log\left(dx+c\right)}{\left(bcd-ad^{2}\right)g^{2}}\right)\log\left(e\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x, algorithm="ma
xima")
```

```
[Out] 2*A*B*n*(1/(d^2*g^2*x + c*d*g^2) + b*log(b*x + a)/((b*c*d - a*d^2)*g^2) - b
*log(d*x + c)/((b*c*d - a*d^2)*g^2)) + (2*n*(1/(d^2*g^2*x + c*d*g^2) + b*lo
```

```
g(b*x + a)/((b*c*d - a*d^2)*g^2) - b*log(d*x + c)/((b*c*d - a*d^2)*g^2))*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n) - ((b*d*x + b*c)*log(b*x + a)^2 + (b*d
*x + b*c)*log(d*x + c)^2 + 2*b*c - 2*a*d + 2*(b*d*x + b*c)*log(b*x + a) - 2
*(b*d*x + b*c + (b*d*x + b*c)*log(b*x + a))*log(d*x + c))*n^2/(b*c^2*d*g^2
- a*c*d^2*g^2 + (b*c*d^2*g^2 - a*d^3*g^2)*x))*B^2 - B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(d^2*g^2*x + c*d*g^2) - 2*A*B*log(e*(b*x/(d*x + c) +
a/(d*x + c))^n)/(d^2*g^2*x + c*d*g^2) - A^2/(d^2*g^2*x + c*d*g^2)
```

Fricas [A] time = 0.879876, size = 555, normalized size = 3.4

$$-\frac{A^2bc - A^2ad + 2\left(B^2bc - B^2ad\right)n^2 + \left(B^2bc - B^2ad\right)\log\left(e\right)^2 - \left(B^2bdn^2x + B^2adn^2\right)\log\left(\frac{bx+a}{dx+c}\right)^2 - 2\left(ABbc - ABad\right)n + 2}{\left(bcd^2 - ad^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x, algorithm="fr
icas")
```

```
[Out] -(A^2*b*c - A^2*a*d + 2*(B^2*b*c - B^2*a*d)*n^2 + (B^2*b*c - B^2*a*d)*log(e
)^2 - (B^2*b*d*n^2*x + B^2*a*d*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(A*B*b*c
 - A*B*a*d)*n + 2*(A*B*b*c - A*B*a*d - (B^2*b*c - B^2*a*d)*n - (B^2*b*d*n*x
 + B^2*a*d*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*(B^2*a*d*n^2 - A*B*a*d*n
 + (B^2*b*d*n^2 - A*B*b*d*n)*x)*log((b*x + a)/(d*x + c)))/((b*c*d^2 - a*d^3
)*g^2*x + (b*c^2*d - a*c*d^2)*g^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(dgx+cg\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^2,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*g*x + c*g)^2, x)
```

3.44 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^3}\,dx$

Optimal. Leaf size=317

$$\frac{Bdn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g^3(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{g^3(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g^3(c+dx)^2(bc-ad)^2}-\frac{2}{g^3(c}$$

```
[Out] -(B^2*d*n^2*(a + b*x)^2)/(4*(b*c - a*d)^2*g^3*(c + d*x)^2) - (2*A*b*B*n*(a
+ b*x))/((b*c - a*d)^2*g^3*(c + d*x)) + (2*b*B^2*n^2*(a + b*x))/((b*c - a*d
)^2*g^3*(c + d*x)) - (2*b*B^2*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
(b*c - a*d)^2*g^3*(c + d*x)) + (B*d*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(2*(b*c - a*d)^2*g^3*(c + d*x)^2) - (d*(a + b*x)^2*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n])^2)/(2*(b*c - a*d)^2*g^3*(c + d*x)^2) + (b*(a
+ b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*c - a*d)^2*g^3*(c + d*
x))
```

Rubi [C] time = 0.915045, antiderivative size = 626, normalized size of antiderivative = 1.97, number of steps used = 28, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{b^2B^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{dg^3(bc-ad)^2}+\frac{b^2B^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{dg^3(bc-ad)^2}+\frac{b^2Bn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{dg^3(bc-ad)^2}-\frac{b^2Bn\log(c+}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^3,x]
```

```
[Out] -(B^2*n^2)/(4*d*g^3*(c + d*x)^2) - (3*b*B^2*n^2)/(2*d*(b*c - a*d)*g^3*(c +
d*x)) - (3*b^2*B^2*n^2*Log[a + b*x])/(2*d*(b*c - a*d)^2*g^3) - (b^2*B^2*n^2
*Log[a + b*x]^2)/(2*d*(b*c - a*d)^2*g^3) + (B*n*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))/(2*d*g^3*(c + d*x)^2) + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*
x))^n]))/(d*(b*c - a*d)*g^3*(c + d*x)) + (b^2*B*n*Log[a + b*x]*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]))/(d*(b*c - a*d)^2*g^3) - (A + B*Log[e*((a + b*x)
/(c + d*x))^n])^2/(2*d*g^3*(c + d*x)^2) + (3*b^2*B^2*n^2*Log[c + d*x])/(2*d
*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/(d*(b*c - a*d)^2*g^3) - (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n])*Log[c + d*x])/(d*(b*c - a*d)^2*g^3) - (b^2*B^2*n^2*Log[c + d*x]^2)/(2*
```

```
d*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(d*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c
- a*d))])/(d*(b*c - a*d)^2*g^3) + (b^2*B^2*n^2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/(d*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

```
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^3}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^2(a+bx)(c+dx)^3}\,dx}{dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2} + \frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^3}\,dx}{dg^3}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2} + \frac{(B(bc-ad)n)\int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^3(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(c+dx)^3}\right.}{dg^3}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2dg^3(c+dx)^2} - \frac{(Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^3}\,dx}{g^3} - \frac{\left(b^2Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,d}{(bc-ad)^2g^3}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2dg^3(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^3(c+dx)} + \frac{b^2Bn\log(a+bx)\left(A+\right.}{d(bc-ad}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2dg^3(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^3(c+dx)} + \frac{b^2Bn\log(a+bx)\left(A+\right.}{d(bc-ad}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2dg^3(c+dx)^2} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{d(bc-ad)g^3(c+dx)} + \frac{b^2Bn\log(a+bx)\left(A+\right.}{d(bc-ad}$$

$$= -\frac{B^2n^2}{4dg^3(c+dx)^2} - \frac{3bB^2n^2}{2d(bc-ad)g^3(c+dx)} - \frac{3b^2B^2n^2\log(a+bx)}{2d(bc-ad)^2g^3} + \frac{Bn\left(A+B\log\left(e\left(\right.\right.\right.}{2dg^3(c+dx}$$

$$= -\frac{B^2n^2}{4dg^3(c+dx)^2} - \frac{3bB^2n^2}{2d(bc-ad)g^3(c+dx)} - \frac{3b^2B^2n^2\log(a+bx)}{2d(bc-ad)^2g^3} - \frac{b^2B^2n^2\log^2(a+bx}{2d(bc-ad)^2g^3}$$

$$= -\frac{B^2n^2}{4dg^3(c+dx)^2} - \frac{3bB^2n^2}{2d(bc-ad)g^3(c+dx)} - \frac{3b^2B^2n^2\log(a+bx)}{2d(bc-ad)^2g^3} - \frac{b^2B^2n^2\log^2(a+bx}{2d(bc-ad)^2g^3}$$

Mathematica [C] time = 0.49214, size = 464, normalized size = 1.46

$$\frac{Bn\left(-2b^2Bn(c+dx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2b^2Bn(c+dx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^3,x]
```

```
[Out] (-2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*(b*c - a*d)^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 4*b*(b*c - a*d)*(c + d*x)*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]) + 4*b^2*(c + d*x)^2*Log[a + b*x]*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]) - 4*b^2*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x] - 4*b*B*n*(c + d*x)*(b*c - a*d + b*(c + d*x)*Log[a + b*x
] - b*(c + d*x)*Log[c + d*x]) - B*n*((b*c - a*d)^2 + 2*b*(b*c - a*d)*(c + d
*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*x)^2*Log[c + d*x]) - 2*
b^2*B*n*(c + d*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c
- a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^2*B*n*(c + d*x
)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*
PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*d*g^3*(c + d*x)^
2)
```

Maple [F] time = 0.441, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x)
```

Maxima [B] time = 1.38282, size = 1162, normalized size = 3.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x, algorithm="ma
xima")
```

```
[Out] 1/2*A*B*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*d^4)*g^3*x^2 + 2*(b*c^2*d^
2 - a*c*d^3)*g^3*x + (b*c^3*d - a*c^2*d^2)*g^3) + 2*b^2*log(b*x + a)/((b^2*
```

```
c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3) - 2*b^2*log(d*x + c)/((b^2*c^2*d - 2*a*
b*c*d^2 + a^2*d^3)*g^3)) + 1/4*(2*n*((2*b*d*x + 3*b*c - a*d)/((b*c*d^3 - a*
d^4)*g^3*x^2 + 2*(b*c^2*d^2 - a*c*d^3)*g^3*x + (b*c^3*d - a*c^2*d^2)*g^3) +
 2*b^2*log(b*x + a)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3) - 2*b^2*log(d
*x + c)/((b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*g^3))*log(e*(b*x/(d*x + c) + a
/(d*x + c))^n) - (7*b^2*c^2 - 8*a*b*c*d + a^2*d^2 + 2*(b^2*d^2*x^2 + 2*b^2*
c*d*x + b^2*c^2)*log(b*x + a)^2 + 2*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*l
og(d*x + c)^2 + 6*(b^2*c*d - a*b*d^2)*x + 6*(b^2*d^2*x^2 + 2*b^2*c*d*x + b^
2*c^2)*log(b*x + a) - 2*(3*b^2*d^2*x^2 + 6*b^2*c*d*x + 3*b^2*c^2 + 2*(b^2*d
^2*x^2 + 2*b^2*c*d*x + b^2*c^2)*log(b*x + a))*log(d*x + c))*n^2/(b^2*c^4*d*
g^3 - 2*a*b*c^3*d^2*g^3 + a^2*c^2*d^3*g^3 + (b^2*c^2*d^3*g^3 - 2*a*b*c*d^4*
g^3 + a^2*d^5*g^3)*x^2 + 2*(b^2*c^3*d^2*g^3 - 2*a*b*c^2*d^3*g^3 + a^2*c*d^4
*g^3)*x))*B^2 - 1/2*B^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)^2/(d^3*g^3*x
^2 + 2*c*d^2*g^3*x + c^2*d*g^3) - A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n
)/(d^3*g^3*x^2 + 2*c*d^2*g^3*x + c^2*d*g^3) - 1/2*A^2/(d^3*g^3*x^2 + 2*c*d^
2*g^3*x + c^2*d*g^3)
```

Fricas [B] time = 0.969725, size = 1354, normalized size = 4.27

$$-\frac{2A^2b^2c^2 - 4A^2abcd + 2A^2a^2d^2 + \left(7B^2b^2c^2 - 8B^2abcd + B^2a^2d^2\right)n^2 + 2\left(B^2b^2c^2 - 2B^2abcd + B^2a^2d^2\right)\log(e)^2 - 2\left(B\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/4*(2*A^2*b^2*c^2 - 4*A^2*a*b*c*d + 2*A^2*a^2*d^2 + (7*B^2*b^2*c^2 - 8*B^
2*a*b*c*d + B^2*a^2*d^2)*n^2 + 2*(B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2
)*log(e)^2 - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*b^2*c*d*n^2*x + (2*B^2*a*b*c*d
- B^2*a^2*d^2)*n^2)*log((b*x + a)/(d*x + c))^2 - 2*(3*A*B*b^2*c^2 - 4*A*B*a
*b*c*d + A*B*a^2*d^2)*n + 2*(3*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2 - 2*(A*B*b^2
*c*d - A*B*a*b*d^2)*n)*x + 2*(2*A*B*b^2*c^2 - 4*A*B*a*b*c*d + 2*A*B*a^2*d^2
 - 2*(B^2*b^2*c*d - B^2*a*b*d^2)*n*x - (3*B^2*b^2*c^2 - 4*B^2*a*b*c*d + B^2
*a^2*d^2)*n - 2*(B^2*b^2*d^2*n*x^2 + 2*B^2*b^2*c*d*n*x + (2*B^2*a*b*c*d - B
^2*a^2*d^2)*n)*log((b*x + a)/(d*x + c)))*log(e) + 2*((4*B^2*a*b*c*d - B^2*a
^2*d^2)*n^2 + (3*B^2*b^2*d^2*n^2 - 2*A*B*b^2*d^2*n)*x^2 - 2*(2*A*B*a*b*c*d
- A*B*a^2*d^2)*n - 2*(2*A*B*b^2*c*d*n - (2*B^2*b^2*c*d + B^2*a*b*d^2)*n^2)*
x)*log((b*x + a)/(d*x + c)))/((b^2*c^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*g^3*x^2
 + 2*(b^2*c^3*d^2 - 2*a*b*c^2*d^3 + a^2*c*d^4)*g^3*x + (b^2*c^4*d - 2*a*b*c
^3*d^2 + a^2*c^2*d^3)*g^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(dgx+cg\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^3,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*g*x + c*g)^3, x)
```

3.45 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^4} dx$

Optimal. Leaf size=429

$$\frac{2b^3Bn\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3dg^4(bc-ad)^3}-\frac{2b^2Bn(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^4(c+dx)(bc-ad)^3}-\frac{2Bd^2n(a+bx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{9g^4(c+dx)^3(bc-ad)^3}$$

```
[Out] (2*B^2*d^2*n^2*(a + b*x)^3)/(27*(b*c - a*d)^3*g^4*(c + d*x)^3) - (b*B^2*d*n
^2*(a + b*x)^2)/(2*(b*c - a*d)^3*g^4*(c + d*x)^2) + (2*b^2*B^2*n^2*(a + b*x
))/((b*c - a*d)^3*g^4*(c + d*x)) - (2*B*d^2*n*(a + b*x)^3*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n]))/(9*(b*c - a*d)^3*g^4*(c + d*x)^3) + (b*B*d*n*(a + b*
x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)^3*g^4*(c + d*x)^2
) - (2*b^2*B*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*
d)^3*g^4*(c + d*x)) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(3*d*g^4*(c
+ d*x)^3) + (2*b^3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(a + b*x)
/(c + d*x)])/(3*d*(b*c - a*d)^3*g^4) - (b^3*B^2*n^2*Log[(a + b*x)/(c + d*x)
]^2)/(3*d*(b*c - a*d)^3*g^4)
```

Rubi [C] time = 1.098, antiderivative size = 736, normalized size of antiderivative = 1.72, number of steps used = 32, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$\frac{2b^3B^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3dg^4(bc-ad)^3}+\frac{2b^3B^2n^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3dg^4(bc-ad)^3}+\frac{2b^3Bn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3dg^4(bc-ad)^3}-\frac{2b^3Bn\,l}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^4,x]
```

```
[Out] (-2*B^2*n^2)/(27*d*g^4*(c + d*x)^3) - (5*b*B^2*n^2)/(18*d*(b*c - a*d)*g^4*(
c + d*x)^2) - (11*b^2*B^2*n^2)/(9*d*(b*c - a*d)^2*g^4*(c + d*x)) - (11*b^3*
B^2*n^2*Log[a + b*x])/(9*d*(b*c - a*d)^3*g^4) - (b^3*B^2*n^2*Log[a + b*x]^2
)/(3*d*(b*c - a*d)^3*g^4) + (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(9*d*g^4*(c + d*x)^3) + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*d
*(b*c - a*d)*g^4*(c + d*x)^2) + (2*b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x
))^n]))/(3*d*(b*c - a*d)^2*g^4*(c + d*x)) + (2*b^3*B*n*Log[a + b*x]*(A + B*
Log[e*((a + b*x)/(c + d*x))^n]))/(3*d*(b*c - a*d)^3*g^4) - (A + B*Log[e*((a
```

```
 + b*x)/(c + d*x))^n])^2/(3*d*g^4*(c + d*x)^3) + (11*b^3*B^2*n^2*Log[c + d*
x])/(9*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(3*d*(b*c - a*d)^3*g^4) - (2*b^3*B*n*(A + B*Log[e*((a + b
*x)/(c + d*x))^n])*Log[c + d*x])/(3*d*(b*c - a*d)^3*g^4) - (b^3*B^2*n^2*Log
[c + d*x]^2)/(3*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(3*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*PolyLog[2,
 -((d*(a + b*x))/(b*c - a*d))])/(3*d*(b*c - a*d)^3*g^4) + (2*b^3*B^2*n^2*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*d*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^4}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^3(a+bx)(c+dx)^4}\,dx}{3dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^4}\,dx}{3dg^4}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3} + \frac{(2B(bc-ad)n)\int \left(\frac{b^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^4(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{(bc-ad)(c+dx)^4}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3dg^4(c+dx)^3} - \frac{(2Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^4}\,dx}{3g^4} - \frac{\left(2b^3Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}}{3(bc-ad)^3g^4}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9dg^4(c+dx)^3} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d(bc-ad)g^4(c+dx)^2} + \frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3d(bc-ad)^2g^4(c+}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9dg^4(c+dx)^3} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d(bc-ad)g^4(c+dx)^2} + \frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3d(bc-ad)^2g^4(c+}$$

$$= \frac{2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{9dg^4(c+dx)^3} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3d(bc-ad)g^4(c+dx)^2} + \frac{2b^2Bn\left(A+B\log\left(e\left(\frac{a}{c}\right.\right.\right.}{3d(bc-ad)^2g^4(c+}$$

$$= -\frac{2B^2n^2}{27dg^4(c+dx)^3} - \frac{5bB^2n^2}{18d(bc-ad)g^4(c+dx)^2} - \frac{11b^2B^2n^2}{9d(bc-ad)^2g^4(c+dx)} - \frac{11b^3B^2n^2\log(}{9d(bc-ad}$$

$$= -\frac{2B^2n^2}{27dg^4(c+dx)^3} - \frac{5bB^2n^2}{18d(bc-ad)g^4(c+dx)^2} - \frac{11b^2B^2n^2}{9d(bc-ad)^2g^4(c+dx)} - \frac{11b^3B^2n^2\log(}{9d(bc-ad}$$

$$= -\frac{2B^2n^2}{27dg^4(c+dx)^3} - \frac{5bB^2n^2}{18d(bc-ad)g^4(c+dx)^2} - \frac{11b^2B^2n^2}{9d(bc-ad)^2g^4(c+dx)} - \frac{11b^3B^2n^2\log(}{9d(bc-ad}$$

Mathematica [C] time = 0.774851, size = 609, normalized size = 1.42

$$\frac{Bn\left(-18b^3Bn(c+dx)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18b^3Bn(c+dx)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^4,x]
```

```
[Out] (-18*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(12*(b*c - a*d)^3*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 18*b*(b*c - a*d)^2*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]) + 36*b^2*(b*c - a*d)*(c + d*x)^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]) + 36*b^3*(c + d*x)^3*Log[a + b*x]*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]) - 36*b^3*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])*Log[c + d*x] - 36*b^2*B*n*(c + d*x)^2*(b*c - a*d + b*(c + d*x)*Lo
g[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 9*b*B*n*(c + d*x)*((b*c - a*d)^2 +
 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2*(c + d*
x)^2*Log[c + d*x]) - 2*B*n*(2*(b*c - a*d)^3 + 3*b*(b*c - a*d)^2*(c + d*x) +
 6*b^2*(b*c - a*d)*(c + d*x)^2 + 6*b^3*(c + d*x)^3*Log[a + b*x] - 6*b^3*(c
+ d*x)^3*Log[c + d*x]) - 18*b^3*B*n*(c + d*x)^3*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) + 18*b^3*B*n*(c + d*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c
- a*d)^3)/(54*d*g^4*(c + d*x)^3)
```

Maple [F] time = 0.441, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{4}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x)
```

Maxima [B] time = 1.61998, size = 1937, normalized size = 4.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x, algorithm="ma
xima")
```

```
[Out] 1/9*A*B*n*((6*b^2*d^2*x^2 + 11*b^2*c^2 - 7*a*b*c*d + 2*a^2*d^2 + 3*(5*b^2*c
*d - a*b*d^2)*x)/((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*g^4*x^3 + 3*(b^2*c^
3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*g^4*x^2 + 3*(b^2*c^4*d^2 - 2*a*b*c^3*d^3
 + a^2*c^2*d^4)*g^4*x + (b^2*c^5*d - 2*a*b*c^4*d^2 + a^2*c^3*d^3)*g^4) + 6*
b^3*log(b*x + a)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4)*g
^4) - 6*b^3*log(d*x + c)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^
3*d^4)*g^4)) + 1/54*(6*n*((6*b^2*d^2*x^2 + 11*b^2*c^2 - 7*a*b*c*d + 2*a^2*d
^2 + 3*(5*b^2*c*d - a*b*d^2)*x)/((b^2*c^2*d^4 - 2*a*b*c*d^5 + a^2*d^6)*g^4*
x^3 + 3*(b^2*c^3*d^3 - 2*a*b*c^2*d^4 + a^2*c*d^5)*g^4*x^2 + 3*(b^2*c^4*d^2
- 2*a*b*c^3*d^3 + a^2*c^2*d^4)*g^4*x + (b^2*c^5*d - 2*a*b*c^4*d^2 + a^2*c^3
*d^3)*g^4) + 6*b^3*log(b*x + a)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d
^3 - a^3*d^4)*g^4) - 6*b^3*log(d*x + c)/((b^3*c^3*d - 3*a*b^2*c^2*d^2 + 3*a
^2*b*c*d^3 - a^3*d^4)*g^4))*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) - (85*b^
3*c^3 - 108*a*b^2*c^2*d + 27*a^2*b*c*d^2 - 4*a^3*d^3 + 66*(b^3*c*d^2 - a*b^
2*d^3)*x^2 + 18*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*l
og(b*x + a)^2 + 18*(b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3
)*log(d*x + c)^2 + 3*(49*b^3*c^2*d - 54*a*b^2*c*d^2 + 5*a^2*b*d^3)*x + 66*(
b^3*d^3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(b*x + a) - 6*(
11*b^3*d^3*x^3 + 33*b^3*c*d^2*x^2 + 33*b^3*c^2*d*x + 11*b^3*c^3 + 6*(b^3*d^
3*x^3 + 3*b^3*c*d^2*x^2 + 3*b^3*c^2*d*x + b^3*c^3)*log(b*x + a))*log(d*x +
c))*n^2/(b^3*c^6*d*g^4 - 3*a*b^2*c^5*d^2*g^4 + 3*a^2*b*c^4*d^3*g^4 - a^3*c^
3*d^4*g^4 + (b^3*c^3*d^4*g^4 - 3*a*b^2*c^2*d^5*g^4 + 3*a^2*b*c*d^6*g^4 - a^
3*d^7*g^4)*x^3 + 3*(b^3*c^4*d^3*g^4 - 3*a*b^2*c^3*d^4*g^4 + 3*a^2*b*c^2*d^5
*g^4 - a^3*c*d^6*g^4)*x^2 + 3*(b^3*c^5*d^2*g^4 - 3*a*b^2*c^4*d^3*g^4 + 3*a^
2*b*c^3*d^4*g^4 - a^3*c^2*d^5*g^4)*x))*B^2 - 1/3*B^2*log(e*(b*x/(d*x + c) +
 a/(d*x + c))^n)^2/(d^4*g^4*x^3 + 3*c*d^3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d
*g^4) - 2/3*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(d^4*g^4*x^3 + 3*c*d
^3*g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4) - 1/3*A^2/(d^4*g^4*x^3 + 3*c*d^3*
g^4*x^2 + 3*c^2*d^2*g^4*x + c^3*d*g^4)
```

Fricas [B] time = 1.06222, size = 2383, normalized size = 5.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/54*(18*A^2*b^3*c^3 - 54*A^2*a*b^2*c^2*d + 54*A^2*a^2*b*c*d^2 - 18*A^2*a^
3*d^3 + (85*B^2*b^3*c^3 - 108*B^2*a*b^2*c^2*d + 27*B^2*a^2*b*c*d^2 - 4*B^2*
a^3*d^3)*n^2 + 6*(11*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 - 6*(A*B*b^3*c*d^2
```

```
 - A*B*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*
b*c*d^2 - B^2*a^3*d^3)*log(e)^2 - 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*b^3*c*d^2
*n^2*x^2 + 3*B^2*b^3*c^2*d*n^2*x + (3*B^2*a*b^2*c^2*d - 3*B^2*a^2*b*c*d^2 +
 B^2*a^3*d^3)*n^2)*log((b*x + a)/(d*x + c))^2 - 6*(11*A*B*b^3*c^3 - 18*A*B*
a*b^2*c^2*d + 9*A*B*a^2*b*c*d^2 - 2*A*B*a^3*d^3)*n + 3*((49*B^2*b^3*c^2*d -
 54*B^2*a*b^2*c*d^2 + 5*B^2*a^2*b*d^3)*n^2 - 6*(5*A*B*b^3*c^2*d - 6*A*B*a*b
^2*c*d^2 + A*B*a^2*b*d^3)*n)*x + 6*(6*A*B*b^3*c^3 - 18*A*B*a*b^2*c^2*d + 18
*A*B*a^2*b*c*d^2 - 6*A*B*a^3*d^3 - 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n*x^2
- 3*(5*B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + B^2*a^2*b*d^3)*n*x - (11*B^2*b^3
*c^3 - 18*B^2*a*b^2*c^2*d + 9*B^2*a^2*b*c*d^2 - 2*B^2*a^3*d^3)*n - 6*(B^2*b
^3*d^3*n*x^3 + 3*B^2*b^3*c*d^2*n*x^2 + 3*B^2*b^3*c^2*d*n*x + (3*B^2*a*b^2*c
^2*d - 3*B^2*a^2*b*c*d^2 + B^2*a^3*d^3)*n)*log((b*x + a)/(d*x + c)))*log(e)
 + 6*((11*B^2*b^3*d^3*n^2 - 6*A*B*b^3*d^3*n)*x^3 + (18*B^2*a*b^2*c^2*d - 9*
B^2*a^2*b*c*d^2 + 2*B^2*a^3*d^3)*n^2 - 3*(6*A*B*b^3*c*d^2*n - (9*B^2*b^3*c*
d^2 + 2*B^2*a*b^2*d^3)*n^2)*x^2 - 6*(3*A*B*a*b^2*c^2*d - 3*A*B*a^2*b*c*d^2
+ A*B*a^3*d^3)*n - 3*(6*A*B*b^3*c^2*d*n - (6*B^2*b^3*c^2*d + 6*B^2*a*b^2*c*
d^2 - B^2*a^2*b*d^3)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^3*c^3*d^4 - 3*a*
b^2*c^2*d^5 + 3*a^2*b*c*d^6 - a^3*d^7)*g^4*x^3 + 3*(b^3*c^4*d^3 - 3*a*b^2*c
^3*d^4 + 3*a^2*b*c^2*d^5 - a^3*c*d^6)*g^4*x^2 + 3*(b^3*c^5*d^2 - 3*a*b^2*c^
4*d^3 + 3*a^2*b*c^3*d^4 - a^3*c^2*d^5)*g^4*x + (b^3*c^6*d - 3*a*b^2*c^5*d^2
 + 3*a^2*b*c^4*d^3 - a^3*c^3*d^4)*g^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(dgx+cg\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^4,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*g*x + c*g)^4, x)
```

3.46 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^5}\,dx$

Optimal. Leaf size=536

$$\frac{b^4Bn\log\left(\frac{a+bx}{c+dx}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2dg^5(bc-ad)^4}-\frac{2b^3Bn(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g^5(c+dx)(bc-ad)^4}+\frac{3b^2Bdn(a+bx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{2g^5(c+dx)^2(bc-ad)^4}$$

```
[Out] -(B^2*d^3*n^2*(a + b*x)^4)/(32*(b*c - a*d)^4*g^5*(c + d*x)^4) + (2*b*B^2*d^
2*n^2*(a + b*x)^3)/(9*(b*c - a*d)^4*g^5*(c + d*x)^3) - (3*b^2*B^2*d*n^2*(a
+ b*x)^2)/(4*(b*c - a*d)^4*g^5*(c + d*x)^2) + (2*b^3*B^2*n^2*(a + b*x))/((b
*c - a*d)^4*g^5*(c + d*x)) + (B*d^3*n*(a + b*x)^4*(A + B*Log[e*((a + b*x)/(
c + d*x))^n]))/(8*(b*c - a*d)^4*g^5*(c + d*x)^4) - (2*b*B*d^2*n*(a + b*x)^3
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*c - a*d)^4*g^5*(c + d*x)^3)
+ (3*b^2*B*d*n*(a + b*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*(b*c
- a*d)^4*g^5*(c + d*x)^2) - (2*b^3*B*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/((b*c - a*d)^4*g^5*(c + d*x)) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2/(4*d*g^5*(c + d*x)^4) + (b^4*B*n*(A + B*Log[e*((a + b*x)/(c + d
*x))^n])*Log[(a + b*x)/(c + d*x)])/(2*d*(b*c - a*d)^4*g^5) - (b^4*B^2*n^2*L
og[(a + b*x)/(c + d*x)]^2)/(4*d*(b*c - a*d)^4*g^5)
```

Rubi [C] time = 1.29528, antiderivative size = 826, normalized size of antiderivative = 1.54, number of steps used = 36, number of rules used = 11, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.314, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 44}

$$-\frac{B^2n^2\log^2(a+bx)b^4}{4d(bc-ad)^4g^5}-\frac{B^2n^2\log^2(c+dx)b^4}{4d(bc-ad)^4g^5}-\frac{25B^2n^2\log(a+bx)b^4}{24d(bc-ad)^4g^5}+\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^4}{2d(bc-ad)^4g^5}+\frac{25}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^5,x]
```

```
[Out] -(B^2*n^2)/(32*d*g^5*(c + d*x)^4) - (7*b*B^2*n^2)/(72*d*(b*c - a*d)*g^5*(c
+ d*x)^3) - (13*b^2*B^2*n^2)/(48*d*(b*c - a*d)^2*g^5*(c + d*x)^2) - (25*b^3
*B^2*n^2)/(24*d*(b*c - a*d)^3*g^5*(c + d*x)) - (25*b^4*B^2*n^2*Log[a + b*x]
)/(24*d*(b*c - a*d)^4*g^5) - (b^4*B^2*n^2*Log[a + b*x]^2)/(4*d*(b*c - a*d)^
4*g^5) + (B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(8*d*g^5*(c + d*x)^4)
 + (b*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*d*(b*c - a*d)*g^5*(c +
```

```
d*x)^3) + (b^2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*d*(b*c - a*d
)^2*g^5*(c + d*x)^2) + (b^3*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*
d*(b*c - a*d)^3*g^5*(c + d*x)) + (b^4*B*n*Log[a + b*x]*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/(2*d*(b*c - a*d)^4*g^5) - (A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2/(4*d*g^5*(c + d*x)^4) + (25*b^4*B^2*n^2*Log[c + d*x])/(24*d*(b*
c - a*d)^4*g^5) + (b^4*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*
x])/(2*d*(b*c - a*d)^4*g^5) - (b^4*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])*Log[c + d*x])/(2*d*(b*c - a*d)^4*g^5) - (b^4*B^2*n^2*Log[c + d*x]^2)/(4*
d*(b*c - a*d)^4*g^5) + (b^4*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a
*d)])/(2*d*(b*c - a*d)^4*g^5) + (b^4*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*
c - a*d))])/(2*d*(b*c - a*d)^4*g^5) + (b^4*B^2*n^2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])/(2*d*(b*c - a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(cg+dgx)^5}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g^4(a+bx)(c+dx)^5}\,dx}{2dg}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4} + \frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)^5}\,dx}{2dg^5}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4} + \frac{(B(bc-ad)n)\int \left(\frac{b^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)^5(a+bx)} - \frac{d\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(c+dx)^5}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4dg^5(c+dx)^4} - \frac{(Bn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(c+dx)^5}\,dx}{2g^5} - \frac{\left(b^4Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}\,dx}{2(bc-ad)^4g^5}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8dg^5(c+dx)^4} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d(bc-ad)g^5(c+dx)^3} + \frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{4d(bc-ad)^2g^5(c+dx}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8dg^5(c+dx)^4} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d(bc-ad)g^5(c+dx)^3} + \frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{4d(bc-ad)^2g^5(c+dx}$$

$$= \frac{Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{8dg^5(c+dx)^4} + \frac{bBn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6d(bc-ad)g^5(c+dx)^3} + \frac{b^2Bn\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{4d(bc-ad)^2g^5(c+dx}$$

$$= -\frac{B^2n^2}{32dg^5(c+dx)^4} - \frac{7bB^2n^2}{72d(bc-ad)g^5(c+dx)^3} - \frac{13b^2B^2n^2}{48d(bc-ad)^2g^5(c+dx)^2} - \frac{25b^3}{24d(bc-ad}$$

$$= -\frac{B^2n^2}{32dg^5(c+dx)^4} - \frac{7bB^2n^2}{72d(bc-ad)g^5(c+dx)^3} - \frac{13b^2B^2n^2}{48d(bc-ad)^2g^5(c+dx)^2} - \frac{25b^3}{24d(bc-ad}$$

$$= -\frac{B^2n^2}{32dg^5(c+dx)^4} - \frac{7bB^2n^2}{72d(bc-ad)g^5(c+dx)^3} - \frac{13b^2B^2n^2}{48d(bc-ad)^2g^5(c+dx)^2} - \frac{25b^3}{24d(bc-ad}$$

Mathematica [C] time = 1.08577, size = 776, normalized size = 1.45

$$\frac{Bn\left(-72b^4Bn(c+dx)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+72b^4Bn(c+dx)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(c*g + d*g*x)^5,x]
```

```
[Out] (-72*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(36*(b*c - a*d)^4*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]) + 48*b*(b*c - a*d)^3*(c + d*x)*(A + B*Lo
g[e*((a + b*x)/(c + d*x))^n]) + 72*b^2*(b*c - a*d)^2*(c + d*x)^2*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 144*b^3*(b*c - a*d)*(c + d*x)^3*(A + B*Log[e
*((a + b*x)/(c + d*x))^n]) + 144*b^4*(c + d*x)^4*Log[a + b*x]*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]) - 144*b^4*(c + d*x)^4*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c + d*x] - 144*b^3*B*n*(c + d*x)^3*(b*c - a*d + b*(c + d*x)
*Log[a + b*x] - b*(c + d*x)*Log[c + d*x]) - 36*b^2*B*n*(c + d*x)^2*((b*c -
a*d)^2 + 2*b*(b*c - a*d)*(c + d*x) + 2*b^2*(c + d*x)^2*Log[a + b*x] - 2*b^2
*(c + d*x)^2*Log[c + d*x]) - 8*b*B*n*(c + d*x)*(2*(b*c - a*d)^3 + 3*b*(b*c
- a*d)^2*(c + d*x) + 6*b^2*(b*c - a*d)*(c + d*x)^2 + 6*b^3*(c + d*x)^3*Log[
a + b*x] - 6*b^3*(c + d*x)^3*Log[c + d*x]) - 3*B*n*(3*(b*c - a*d)^4 + 4*b*(
b*c - a*d)^3*(c + d*x) + 6*b^2*(b*c - a*d)^2*(c + d*x)^2 + 12*b^3*(b*c - a*
d)*(c + d*x)^3 + 12*b^4*(c + d*x)^4*Log[a + b*x] - 12*b^4*(c + d*x)^4*Log[c
 + d*x]) - 72*b^4*B*n*(c + d*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c
 + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 72*b
^4*B*n*(c + d*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Lo
g[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^4)/(288
*d*g^5*(c + d*x)^4)
```

Maple [F] time = 0.442, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{5}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x)
```

Maxima [B] time = 2.03036, size = 2886, normalized size = 5.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x, algorithm="ma
xima")
```

```
[Out] 1/24*A*B*n*((12*b^3*d^3*x^3 + 25*b^3*c^3 - 23*a*b^2*c^2*d + 13*a^2*b*c*d^2
- 3*a^3*d^3 + 6*(7*b^3*c*d^2 - a*b^2*d^3)*x^2 + 4*(13*b^3*c^2*d - 5*a*b^2*c
*d^2 + a^2*b*d^3)*x)/((b^3*c^3*d^5 - 3*a*b^2*c^2*d^6 + 3*a^2*b*c*d^7 - a^3*
d^8)*g^5*x^4 + 4*(b^3*c^4*d^4 - 3*a*b^2*c^3*d^5 + 3*a^2*b*c^2*d^6 - a^3*c*d
^7)*g^5*x^3 + 6*(b^3*c^5*d^3 - 3*a*b^2*c^4*d^4 + 3*a^2*b*c^3*d^5 - a^3*c^2*
d^6)*g^5*x^2 + 4*(b^3*c^6*d^2 - 3*a*b^2*c^5*d^3 + 3*a^2*b*c^4*d^4 - a^3*c^3
*d^5)*g^5*x + (b^3*c^7*d - 3*a*b^2*c^6*d^2 + 3*a^2*b*c^5*d^3 - a^3*c^4*d^4)
*g^5) + 12*b^4*log(b*x + a)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d
^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5) - 12*b^4*log(d*x + c)/((b^4*c^4*d - 4*a*
b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5)) + 1/288*(1
2*n*((12*b^3*d^3*x^3 + 25*b^3*c^3 - 23*a*b^2*c^2*d + 13*a^2*b*c*d^2 - 3*a^3
*d^3 + 6*(7*b^3*c*d^2 - a*b^2*d^3)*x^2 + 4*(13*b^3*c^2*d - 5*a*b^2*c*d^2 +
a^2*b*d^3)*x)/((b^3*c^3*d^5 - 3*a*b^2*c^2*d^6 + 3*a^2*b*c*d^7 - a^3*d^8)*g^
5*x^4 + 4*(b^3*c^4*d^4 - 3*a*b^2*c^3*d^5 + 3*a^2*b*c^2*d^6 - a^3*c*d^7)*g^5
*x^3 + 6*(b^3*c^5*d^3 - 3*a*b^2*c^4*d^4 + 3*a^2*b*c^3*d^5 - a^3*c^2*d^6)*g^
5*x^2 + 4*(b^3*c^6*d^2 - 3*a*b^2*c^5*d^3 + 3*a^2*b*c^4*d^4 - a^3*c^3*d^5)*g
^5*x + (b^3*c^7*d - 3*a*b^2*c^6*d^2 + 3*a^2*b*c^5*d^3 - a^3*c^4*d^4)*g^5) +
 12*b^4*log(b*x + a)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*
a^3*b*c*d^4 + a^4*d^5)*g^5) - 12*b^4*log(d*x + c)/((b^4*c^4*d - 4*a*b^3*c^3
*d^2 + 6*a^2*b^2*c^2*d^3 - 4*a^3*b*c*d^4 + a^4*d^5)*g^5))*log(e*(b*x/(d*x +
 c) + a/(d*x + c))^n) - (415*b^4*c^4 - 576*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^
2 - 64*a^3*b*c*d^3 + 9*a^4*d^4 + 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(163*b
^4*c^2*d^2 - 176*a*b^3*c*d^3 + 13*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4*b^
4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(b*x + a)^2 +
 72*(b^4*d^4*x^4 + 4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^
4*c^4)*log(d*x + c)^2 + 4*(271*b^4*c^3*d - 324*a*b^3*c^2*d^2 + 60*a^2*b^2*c
*d^3 - 7*a^3*b*d^4)*x + 300*(b^4*d^4*x^4 + 4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*
x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(b*x + a) - 12*(25*b^4*d^4*x^4 + 100*b^4*
c*d^3*x^3 + 150*b^4*c^2*d^2*x^2 + 100*b^4*c^3*d*x + 25*b^4*c^4 + 12*(b^4*d^
4*x^4 + 4*b^4*c*d^3*x^3 + 6*b^4*c^2*d^2*x^2 + 4*b^4*c^3*d*x + b^4*c^4)*log(
b*x + a))*log(d*x + c))*n^2/(b^4*c^8*d*g^5 - 4*a*b^3*c^7*d^2*g^5 + 6*a^2*b^
2*c^6*d^3*g^5 - 4*a^3*b*c^5*d^4*g^5 + a^4*c^4*d^5*g^5 + (b^4*c^4*d^5*g^5 -
4*a*b^3*c^3*d^6*g^5 + 6*a^2*b^2*c^2*d^7*g^5 - 4*a^3*b*c*d^8*g^5 + a^4*d^9*g
^5)*x^4 + 4*(b^4*c^5*d^4*g^5 - 4*a*b^3*c^4*d^5*g^5 + 6*a^2*b^2*c^3*d^6*g^5
- 4*a^3*b*c^2*d^7*g^5 + a^4*c*d^8*g^5)*x^3 + 6*(b^4*c^6*d^3*g^5 - 4*a*b^3*c
^5*d^4*g^5 + 6*a^2*b^2*c^4*d^5*g^5 - 4*a^3*b*c^3*d^6*g^5 + a^4*c^2*d^7*g^5)
*x^2 + 4*(b^4*c^7*d^2*g^5 - 4*a*b^3*c^6*d^3*g^5 + 6*a^2*b^2*c^5*d^4*g^5 - 4
*a^3*b*c^4*d^5*g^5 + a^4*c^3*d^6*g^5)*x))*B^2 - 1/4*B^2*log(e*(b*x/(d*x + c
) + a/(d*x + c))^n)^2/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 +
```

```
4*c^3*d^2*g^5*x + c^4*d*g^5) - 1/2*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^
n)/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*c^3*d^2*g^5*x + c
^4*d*g^5) - 1/4*A^2/(d^5*g^5*x^4 + 4*c*d^4*g^5*x^3 + 6*c^2*d^3*g^5*x^2 + 4*
c^3*d^2*g^5*x + c^4*d*g^5)
```

Fricas [B] time = 1.28624, size = 3615, normalized size = 6.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/288*(72*A^2*b^4*c^4 - 288*A^2*a*b^3*c^3*d + 432*A^2*a^2*b^2*c^2*d^2 - 28
8*A^2*a^3*b*c*d^3 + 72*A^2*a^4*d^4 + 12*(25*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)
*n^2 - 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 + (415*B^2*b^4*c^4 - 576*B
^2*a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 64*B^2*a^3*b*c*d^3 + 9*B^2*a^4*d
^4)*n^2 + 6*((163*B^2*b^4*c^2*d^2 - 176*B^2*a*b^3*c*d^3 + 13*B^2*a^2*b^2*d^
4)*n^2 - 12*(7*A*B*b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + A*B*a^2*b^2*d^4)*n)*x^
2 + 72*(B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3
*b*c*d^3 + B^2*a^4*d^4)*log(e)^2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*b^4*c*d^
3*n^2*x^3 + 6*B^2*b^4*c^2*d^2*n^2*x^2 + 4*B^2*b^4*c^3*d*n^2*x + (4*B^2*a*b^
3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n^2)*log
((b*x + a)/(d*x + c))^2 - 12*(25*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 36*A*B*
a^2*b^2*c^2*d^2 - 16*A*B*a^3*b*c*d^3 + 3*A*B*a^4*d^4)*n + 4*((271*B^2*b^4*c
^3*d - 324*B^2*a*b^3*c^2*d^2 + 60*B^2*a^2*b^2*c*d^3 - 7*B^2*a^3*b*d^4)*n^2
- 12*(13*A*B*b^4*c^3*d - 18*A*B*a*b^3*c^2*d^2 + 6*A*B*a^2*b^2*c*d^3 - A*B*a
^3*b*d^4)*n)*x + 12*(12*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 72*A*B*a^2*b^2*c
^2*d^2 - 48*A*B*a^3*b*c*d^3 + 12*A*B*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*a*b^
3*d^4)*n*x^3 - 6*(7*B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + B^2*a^2*b^2*d^4)*
n*x^2 - 4*(13*B^2*b^4*c^3*d - 18*B^2*a*b^3*c^2*d^2 + 6*B^2*a^2*b^2*c*d^3 -
B^2*a^3*b*d^4)*n*x - (25*B^2*b^4*c^4 - 48*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*
c^2*d^2 - 16*B^2*a^3*b*c*d^3 + 3*B^2*a^4*d^4)*n - 12*(B^2*b^4*d^4*n*x^4 + 4
*B^2*b^4*c*d^3*n*x^3 + 6*B^2*b^4*c^2*d^2*n*x^2 + 4*B^2*b^4*c^3*d*n*x + (4*B
^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*B^2*a^3*b*c*d^3 - B^2*a^4*d^4)*n
)*log((b*x + a)/(d*x + c)))*log(e) + 12*((25*B^2*b^4*d^4*n^2 - 12*A*B*b^4*d
^4*n)*x^4 - 4*(12*A*B*b^4*c*d^3*n - (22*B^2*b^4*c*d^3 + 3*B^2*a*b^3*d^4)*n^
2)*x^3 + (48*B^2*a*b^3*c^3*d - 36*B^2*a^2*b^2*c^2*d^2 + 16*B^2*a^3*b*c*d^3
- 3*B^2*a^4*d^4)*n^2 - 6*(12*A*B*b^4*c^2*d^2*n - (18*B^2*b^4*c^2*d^2 + 8*B^
2*a*b^3*c*d^3 - B^2*a^2*b^2*d^4)*n^2)*x^2 - 12*(4*A*B*a*b^3*c^3*d - 6*A*B*a
^2*b^2*c^2*d^2 + 4*A*B*a^3*b*c*d^3 - A*B*a^4*d^4)*n - 4*(12*A*B*b^4*c^3*d*n
```

```
 - (12*B^2*b^4*c^3*d + 18*B^2*a*b^3*c^2*d^2 - 6*B^2*a^2*b^2*c*d^3 + B^2*a^3
*b*d^4)*n^2)*x)*log((b*x + a)/(d*x + c)))/((b^4*c^4*d^5 - 4*a*b^3*c^3*d^6 +
 6*a^2*b^2*c^2*d^7 - 4*a^3*b*c*d^8 + a^4*d^9)*g^5*x^4 + 4*(b^4*c^5*d^4 - 4*
a*b^3*c^4*d^5 + 6*a^2*b^2*c^3*d^6 - 4*a^3*b*c^2*d^7 + a^4*c*d^8)*g^5*x^3 +
6*(b^4*c^6*d^3 - 4*a*b^3*c^5*d^4 + 6*a^2*b^2*c^4*d^5 - 4*a^3*b*c^3*d^6 + a^
4*c^2*d^7)*g^5*x^2 + 4*(b^4*c^7*d^2 - 4*a*b^3*c^6*d^3 + 6*a^2*b^2*c^5*d^4 -
 4*a^3*b*c^4*d^5 + a^4*c^3*d^6)*g^5*x + (b^4*c^8*d - 4*a*b^3*c^7*d^2 + 6*a^
2*b^2*c^6*d^3 - 4*a^3*b*c^5*d^4 + a^4*c^4*d^5)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(d*g*x+c*g)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{\left(dgx+cg\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(d*g*x+c*g)^5,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(d*g*x + c*g)^5, x)
```

3.47 $\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=37

$$\text{Unintegrable}\left(\frac{(cg+dgx)^2}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi [A] time = 0.214294, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] c^2*g^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + 2*c*d*
g^2*Defer[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x] + d^2*g^2*Defer
[Int][x^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\int\left(\frac{c^2g^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{2cdg^2x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{d^2g^2x^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx$$

$$=\left(c^2g^2\right)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(2cdg^2\right)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+\left(d^2g^2\right)\int \frac{}{A}$$

Mathematica [A] time = 0.437876, size = 0, normalized size = 0.

$$\int \frac{(cg+dgx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Maple [A] time = 0.398, size = 0, normalized size = 0.

$$\int (dgx+cg)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dgx+cg)^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] integrate((d*g*x + c*g)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{d^2g^2x^2 + 2\,cdg^2x + c^2g^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] integral((d^2*g^2*x^2 + 2*c*d*g^2*x + c^2*g^2)/(B*log(e*((b*x + a)/(d*x + c
))^n) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dgx + cg)^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] integrate((d*g*x + c*g)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

3.48 $\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=35

$$\text{Unintegrable}\left(\frac{cg+dgx}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi [A] time = 0.114506, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] c*g*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + d*g*Defer[
Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{cg+dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{cg}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{dgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= (cg)\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(dg)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.2834, size = 0, normalized size = 0.

$$\int \frac{cg + dgx}{A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Maple [A] time = 0.303, size = 0, normalized size = 0.

$$\int (dgx + cg)\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{dgx + cg}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] integrate((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{dgx + cg}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] integral((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{dgx + cg}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

3.49 $\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=37

$$\text{Unintegrable}\left(\frac{1}{(cg+dgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi [A] time = 0.0831093, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.17414, size = 0, normalized size = 0.

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Maple [A] time = 0.54, size = 0, normalized size = 0.

$$\int \frac{1}{dgx+cg}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((d*g*x + c*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Adgx+Acg+(Bdgx+Bcg)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fric
as")
```

```
[Out] integral(1/(A*d*g*x + A*c*g + (B*d*g*x + B*c*g)*log(e*((b*x + a)/(d*x + c))
^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac
")
```

```
[Out] integrate(1/((d*g*x + c*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

3.50 $\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=96

$$\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(c+dx)(bc-ad)}$$

```
[Out] ((a + b*x)*ExpIntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)])/(B*
(b*c - a*d)*E^(A/(B*n))*g^2*n*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Rubi [F] time = 0.100225, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx = \int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.119399, size = 96, normalized size = 1.

$$\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^2n(c+dx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] ((a + b*x)*ExpIntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)])/(B*
(b*c - a*d)*E^(A/(B*n))*g^2*n*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x))
```

Maple [F] time = 0.438, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^{2}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((d*g*x + c*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

Fricas [A] time = 0.904063, size = 149, normalized size = 1.55

$$\frac{e^{\left(-\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(bx+a)e^{\left(\frac{B\log(e)+A}{Bn}\right)}}{dx+c}\right)}{(Bbc-Bad)g^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

```
[Out] e^(-(B*log(e) + A)/(B*n))*log_integral((b*x + a)*e^((B*log(e) + A)/(B*n))/(
d*x + c))/((B*b*c - B*a*d)*g^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((d*g*x + c*g)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

3.51 $\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=199

$$\frac{b(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{Bg^3n(c+dx)(bc-ad)^2}-\frac{d(a+bx)^2e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\text{Ei}\left(\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{Bg^3n(c+dx)^2(bc-ad)^2}$$

```
[Out] (b*(a + b*x)*ExpIntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)])/(
B*(b*c - a*d)^2*E^(A/(B*n))*g^3*n*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d
*x)) - (d*(a + b*x)^2*ExpIntegralEi[(2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
]))/(B*n)])/(B*(b*c - a*d)^2*E^((2*A)/(B*n))*g^3*n*(e*((a + b*x)/(c + d*x))
^n)^(2/n)*(c + d*x)^2)
```

Rubi [F] time = 0.0828902, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.290127, size = 174, normalized size = 0.87

$$\frac{(a+bx)e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\left(be^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)-d(a+bx)\text{Ei}\left(\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)\right)}{Bg^3n(c+dx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] ((a + b*x)*(b*E^(A/(B*n))*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpI
ntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)] - d*(a + b*x)*ExpIn
tegralEi[(2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(B*n)]))/(B*(b*c - a*d)
^2*E^((2*A)/(B*n))*g^3*n*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2)
```

Maple [F] time = 0.435, size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(d*g*x+c*g)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((d*g*x + c*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

Fricas [A] time = 0.88901, size = 351, normalized size = 1.76

$$\frac{\left(be^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(bx+a)e^{\left(\frac{B\log(e)+A}{Bn}\right)}}{dx+c}\right)-d\operatorname{log\_integral}\left(\frac{\left(b^2x^2+2\,abx+a^2\right)e^{\left(\frac{2\,(B\log(e)+A)}{Bn}\right)}}{d^2x^2+2\,cdx+c^2}\right)\right)e^{\left(-\frac{2\,(B\log(e)+A)}{Bn}\right)}}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)g^3n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fr
icas")
```

```
[Out] (b*e^((B*log(e) + A)/(B*n))*log_integral((b*x + a)*e^((B*log(e) + A)/(B*n))
/(d*x + c)) - d*log_integral((b^2*x^2 + 2*a*b*x + a^2)*e^(2*(B*log(e) + A)/
(B*n))/(d^2*x^2 + 2*c*d*x + c^2)))*e^(-2*(B*log(e) + A)/(B*n))/((B*b^2*c^2
- 2*B*a*b*c*d + B*a^2*d^2)*g^3*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)^3\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((d*g*x + c*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

3.52 $\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\text{Unintegrable}\left(\frac{(cg+dgx)^2}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi [A] time = 0.232878, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] c^2*g^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + 2*c*d*
g^2*Defer[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x] + d^2*g^2*Def
er[Int][x^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx = \int \left(\frac{c^2g^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{2cdg^2x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{d^2g^2x^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right.$$

$$= \left(c^2g^2\right)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx + \left(2cdg^2\right)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx + \left(d\right.$$

Mathematica [A] time = 0.989418, size = 0, normalized size = 0.

$$\int \frac{(cg+dgx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(c*g + d*g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Maple [A] time = 0.392, size = 0, normalized size = 0.

$$\int \left(dgx+cg\right)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bd^3g^2x^4+ac^3g^2+\left(3\,bcd^2g^2+ad^3g^2\right)x^3+3\left(bc^2dg^2+acd^2g^2\right)x^2+\left(bc^3g^2+3\,ac^2dg^2\right)x}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^2}+\int\frac{}{(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] -(b*d^3*g^2*x^4 + a*c^3*g^2 + (3*b*c*d^2*g^2 + a*d^3*g^2)*x^3 + 3*(b*c^2*d*
g^2 + a*c*d^2*g^2)*x^2 + (b*c^3*g^2 + 3*a*c^2*d*g^2)*x)/((b*c*n - a*d*n)*B^
2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)
*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrate((4*b*d^3*g^2*x^3 + b*
c^3*g^2 + 3*a*c^2*d*g^2 + 3*(3*b*c*d^2*g^2 + a*d^3*g^2)*x^2 + 6*(b*c^2*d*g^
```

```
2 + a*c*d^2*g^2)*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)
*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))
*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{d^{2} g^{2} x^{2} + 2 \, c d g^{2} x + c^{2} g^{2}}{B^{2} \log\left(e \left(\frac{b x + a}{d x + c}\right)^{n}\right)^{2} + 2 \, A B \log\left(e \left(\frac{b x + a}{d x + c}\right)^{n}\right) + A^{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral((d^2*g^2*x^2 + 2*c*d*g^2*x + c^2*g^2)/(B^2*log(e*((b*x + a)/(d*x +
 c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*x + c))^n) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(dgx + cg)^{2}}{\left(B \log\left(e \left(\frac{bx+a}{dx+c}\right)^{n}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((d*g*x + c*g)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.53 $\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=35

$$\text{Unintegrable}\left(\frac{cg+dgx}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi [A] time = 0.123848, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] c*g*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + d*g*Defer[
Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{cg+dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{cg}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{dgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right)dx\\ &= (cg)\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+(dg)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.959053, size = 0, normalized size = 0.

$$\int \frac{cg + dgx}{\left(A + B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(c*g + d*g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Maple [A] time = 0.243, size = 0, normalized size = 0.

$$\int (dgx + cg)\left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bd^2gx^3 + ac^2g + \left(2\,bcdg + ad^2g\right)x^2 + \left(bc^2g + 2\,acdg\right)x}{(bcn - adn)B^2\log\left((bx+a)^n\right) - (bcn - adn)B^2\log\left((dx+c)^n\right) + (bcn - adn)AB + (bcn\log(e) - adn\log(e))B^2} + \int \frac{\ }{(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] -(b*d^2*g*x^3 + a*c^2*g + (2*b*c*d*g + a*d^2*g)*x^2 + (b*c^2*g + 2*a*c*d*g)
*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x +
c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrat
e((3*b*d^2*g*x^2 + b*c^2*g + 2*a*c*d*g + 2*(2*b*c*d*g + a*d^2*g)*x)/((b*c*n
 - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*
```

```
c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{dgx+cg}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral((d*g*x + c*g)/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*
((b*x + a)/(d*x + c))^n) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{dgx+cg}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate((d*g*x + c*g)/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.54 $\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=37

$$\text{Unintegrable}\left(\frac{1}{(cg+dgx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi [A] time = 0.0903306, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]

[Out] Defer[Int][1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.535532, size = 0, normalized size = 0.

$$\int \frac{1}{(cg+dgx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Integrate[1/((c*g + d*g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Maple [A] time = 0.427, size = 0, normalized size = 0.

$$\int \frac{1}{dgx+cg}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$b\int \frac{1}{\left(bcgn-adgn\right)B^{2}\log\left((bx+a)^{n}\right)-\left(bcgn-adgn\right)B^{2}\log\left((dx+c)^{n}\right)+\left(bcgn-adgn\right)AB+\left(bcgn\log\left(e\right)-adgn\log\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="ma
xima")
```

```
[Out] b*integrate(1/((b*c*g*n - a*d*g*n)*B^2*log((b*x + a)^n) - (b*c*g*n - a*d*g*
n)*B^2*log((d*x + c)^n) + (b*c*g*n - a*d*g*n)*A*B + (b*c*g*n*log(e) - a*d*g
*n*log(e))*B^2), x) - (b*x + a)/((b*c*g*n - a*d*g*n)*B^2*log((b*x + a)^n) -
 (b*c*g*n - a*d*g*n)*B^2*log((d*x + c)^n) + (b*c*g*n - a*d*g*n)*A*B + (b*c*
g*n*log(e) - a*d*g*n*log(e))*B^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2dgx + A^2cg + \left(B^2dgx + B^2cg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABdgx + ABcg\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*d*g*x + A^2*c*g + (B^2*d*g*x + B^2*c*g)*log(e*((b*x + a)/(d
*x + c))^n)^2 + 2*(A*B*d*g*x + A*B*c*g)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx + cg\right)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((d*g*x + c*g)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

3.55 $\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=154

$$\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\operatorname{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^2n^2(c+dx)(bc-ad)}-\frac{a+bx}{Bg^2n(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

```
[Out] ((a + b*x)*ExpIntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)])/(B^
2*(b*c - a*d)*E^(A/(B*n))*g^2*n^2*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d
*x)) - (a + b*x)/(B*(b*c - a*d)*g^2*n*(c + d*x)*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n]))
```

Rubi [F] time = 0.103582, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(cg+dgx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.171179, size = 180, normalized size = 1.17

$$-\frac{(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\left(Bne^{\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}-\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)\right)}{B^2g^2n^2(c+dx)(bc-ad)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] -(((a + b*x)*(B*E^(A/(B*n))*n*(e*((a + b*x)/(c + d*x))^n)^n^(-1) - ExpInteg
ralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n])))/(B^2*(b*c - a*d)*E^(A/(B*n))*g^2*n^2*(e*((a + b*x)/(c + d
*x))^n)^n^(-1)*(c + d*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))
```

Maple [F] time = 0.438, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(d*g*x+c*g)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{}{\left(bc^2g^2n-acdg^2n\right)AB+\left(bc^2g^2n\log(e)-acdg^2n\log(e)\right)B^2+\left(\left(bcdg^2n-ad^2g^2n\right)AB+\left(bcdg^2n\log(e)-ad^2g^2n\log(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

```
[Out] -(b*x + a)/((b*c^2*g^2*n - a*c*d*g^2*n)*A*B + (b*c^2*g^2*n*log(e) - a*c*d*g
^2*n*log(e))*B^2 + ((b*c*d*g^2*n - a*d^2*g^2*n)*A*B + (b*c*d*g^2*n*log(e) -
 a*d^2*g^2*n*log(e))*B^2)*x + ((b*c*d*g^2*n - a*d^2*g^2*n)*B^2*x + (b*c^2*g
^2*n - a*c*d*g^2*n)*B^2)*log((b*x + a)^n) - ((b*c*d*g^2*n - a*d^2*g^2*n)*B^
2*x + (b*c^2*g^2*n - a*c*d*g^2*n)*B^2)*log((d*x + c)^n)) - integrate(-1/(B^
2*c^2*g^2*n*log(e) + A*B*c^2*g^2*n + (B^2*d^2*g^2*n*log(e) + A*B*d^2*g^2*n)
*x^2 + 2*(B^2*c*d*g^2*n*log(e) + A*B*c*d*g^2*n)*x + (B^2*d^2*g^2*n*x^2 + 2*
B^2*c*d*g^2*n*x + B^2*c^2*g^2*n)*log((b*x + a)^n) - (B^2*d^2*g^2*n*x^2 + 2*
B^2*c*d*g^2*n*x + B^2*c^2*g^2*n)*log((d*x + c)^n)), x)
```

Fricas [A] time = 0.756198, size = 635, normalized size = 4.12

$$-\frac{\left((Bbnx+Ban)e^{\left(\frac{B\log(e)+A}{Bn}\right)} - \left(Adx+Ac+(Bdx+Bc)\log(e)+(Bdnx+Bcn)\log\left(\frac{bx+a}{dx+c}\right)\right)\log\_integ\right.}{\left(AB^2bcd-AB^2ad^2\right)g^2n^2x+\left(AB^2bc^2-AB^2acd\right)g^2n^2+\left(\left(B^3bcd-B^3ad^2\right)g^2n^2x+\left(B^3bc^2-B^3acd\right)g^2n^2\right)\log(e)+\left(\left(B^3\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

```
[Out] -((B*b*n*x + B*a*n)*e^((B*log(e) + A)/(B*n)) - (A*d*x + A*c + (B*d*x + B*c)
*log(e) + (B*d*n*x + B*c*n)*log((b*x + a)/(d*x + c)))*log_integral((b*x + a
)*e^((B*log(e) + A)/(B*n))/(d*x + c)))*e^(-(B*log(e) + A)/(B*n))/((A*B^2*b*
c*d - A*B^2*a*d^2)*g^2*n^2*x + (A*B^2*b*c^2 - A*B^2*a*c*d)*g^2*n^2 + ((B^3*
b*c*d - B^3*a*d^2)*g^2*n^2*x + (B^3*b*c^2 - B^3*a*c*d)*g^2*n^2)*log(e) + ((
B^3*b*c*d - B^3*a*d^2)*g^2*n^3*x + (B^3*b*c^2 - B^3*a*c*d)*g^2*n^3)*log((b*
x + a)/(d*x + c)))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.45868, size = 396, normalized size = 2.57

$$\frac{\text{Ei}\left(\frac{A}{Bn}+\frac{1}{n}+\log\left(\frac{bx+a}{dx+c}\right)\right)e^{\left(-\frac{A}{Bn}-\frac{1}{n}\right)}}{B^2bcg^2n^2-B^2adg^2n^2}-\frac{}{B^2bcdg^2n^2x\log\left(\frac{bx+a}{dx+c}\right)-B^2ad^2g^2n^2x\log\left(\frac{bx+a}{dx+c}\right)+B^2bc^2g^2n^2\log\left(\frac{bx+a}{dx+c}\right)-B^2acdg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

```
[Out] Ei(A/(B*n) + 1/n + log((b*x + a)/(d*x + c)))*e^(-A/(B*n) - 1/n)/(B^2*b*c*g^
2*n^2 - B^2*a*d*g^2*n^2) - (b*x + a)/(B^2*b*c*d*g^2*n^2*x*log((b*x + a)/(d*
x + c)) - B^2*a*d^2*g^2*n^2*x*log((b*x + a)/(d*x + c)) + B^2*b*c^2*g^2*n^2*
log((b*x + a)/(d*x + c)) - B^2*a*c*d*g^2*n^2*log((b*x + a)/(d*x + c)) + A*B
*b*c*d*g^2*n*x + B^2*b*c*d*g^2*n*x - A*B*a*d^2*g^2*n*x - B^2*a*d^2*g^2*n*x
+ A*B*b*c^2*g^2*n + B^2*b*c^2*g^2*n - A*B*a*c*d*g^2*n - B^2*a*c*d*g^2*n)
```

3.56 $\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=256

$$-\frac{2d(a+bx)^2e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\operatorname{Ei}\left(\frac{2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{Bn}\right)}{B^2g^3n^2(c+dx)^2(bc-ad)^2}+\frac{b(a+bx)e^{-\frac{A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-1/n}\operatorname{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)}{B^2g^3n^2(c+dx)(bc-ad)^2}-\frac{}{Bg^3n(c\cdots}$$

```
[Out] (b*(a + b*x)*ExpIntegralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)])/(
B^2*(b*c - a*d)^2*E^(A/(B*n))*g^3*n^2*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c
 + d*x)) - (2*d*(a + b*x)^2*ExpIntegralEi[(2*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(B*n)])/(B^2*(b*c - a*d)^2*E^((2*A)/(B*n))*g^3*n^2*(e*((a + b*x)/
(c + d*x))^n)^(2/n)*(c + d*x)^2) - (a + b*x)/(B*(b*c - a*d)*g^3*n*(c + d*x)
^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Rubi [F] time = 0.0943265, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(cg+dgx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.565389, size = 288, normalized size = 1.12

$$\frac{(a+bx)e^{-\frac{2A}{Bn}}\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{-2/n}\left(be^{\frac{A}{Bn}}(c+dx)\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)^{\frac{1}{n}}\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)\text{Ei}\left(\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{Bn}\right)-2d(a+bx)\left(B\log\right.\right.}{B^2g^3n^2(c+dx)^2(bc-ad)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+\right.}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c*g + d*g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] ((a + b*x)*(-(B*(b*c - a*d)*E^((2*A)/(B*n))*n*(e*((a + b*x)/(c + d*x))^n)^(
2/n)) + b*E^(A/(B*n))*(e*((a + b*x)/(c + d*x))^n)^n^(-1)*(c + d*x)*ExpInteg
ralEi[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(B*n)]*(A + B*Log[e*((a + b*x)
/(c + d*x))^n]) - 2*d*(a + b*x)*ExpIntegralEi[(2*(A + B*Log[e*((a + b*x)/(c
 + d*x))^n]))/(B*n)]*(A + B*Log[e*((a + b*x)/(c + d*x))^n])))/(B^2*(b*c - a
*d)^2*E^((2*A)/(B*n))*g^3*n^2*(e*((a + b*x)/(c + d*x))^n)^(2/n)*(c + d*x)^2
*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))
```

Maple [F] time = 0.439, size = 0, normalized size = 0.

$$\int \frac{1}{\left(dgx+cg\right)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*g*x+c*g)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(d*g*x+c*g)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
maxima")
```

```
[Out] -(b*x + a)/((b*c^3*g^3*n - a*c^2*d*g^3*n)*A*B + (b*c^3*g^3*n*log(e) - a*c^2
*d*g^3*n*log(e))*B^2 + ((b*c*d^2*g^3*n - a*d^3*g^3*n)*A*B + (b*c*d^2*g^3*n*
log(e) - a*d^3*g^3*n*log(e))*B^2)*x^2 + 2*((b*c^2*d*g^3*n - a*c*d^2*g^3*n)*
A*B + (b*c^2*d*g^3*n*log(e) - a*c*d^2*g^3*n*log(e))*B^2)*x + ((b*c*d^2*g^3*
n - a*d^3*g^3*n)*B^2*x^2 + 2*(b*c^2*d*g^3*n - a*c*d^2*g^3*n)*B^2*x + (b*c^3
*g^3*n - a*c^2*d*g^3*n)*B^2)*log((b*x + a)^n) - ((b*c*d^2*g^3*n - a*d^3*g^3
*n)*B^2*x^2 + 2*(b*c^2*d*g^3*n - a*c*d^2*g^3*n)*B^2*x + (b*c^3*g^3*n - a*c^
2*d*g^3*n)*B^2)*log((d*x + c)^n)) - integrate((b*d*x - b*c + 2*a*d)/(((b*c*
d^3*g^3*n - a*d^4*g^3*n)*A*B + (b*c*d^3*g^3*n*log(e) - a*d^4*g^3*n*log(e))*
B^2)*x^3 + (b*c^4*g^3*n - a*c^3*d*g^3*n)*A*B + (b*c^4*g^3*n*log(e) - a*c^3*
d*g^3*n*log(e))*B^2 + 3*((b*c^2*d^2*g^3*n - a*c*d^3*g^3*n)*A*B + (b*c^2*d^2
*g^3*n*log(e) - a*c*d^3*g^3*n*log(e))*B^2)*x^2 + 3*((b*c^3*d*g^3*n - a*c^2*
d^2*g^3*n)*A*B + (b*c^3*d*g^3*n*log(e) - a*c^2*d^2*g^3*n*log(e))*B^2)*x + (
(b*c*d^3*g^3*n - a*d^4*g^3*n)*B^2*x^3 + 3*(b*c^2*d^2*g^3*n - a*c*d^3*g^3*n)
*B^2*x^2 + 3*(b*c^3*d*g^3*n - a*c^2*d^2*g^3*n)*B^2*x + (b*c^4*g^3*n - a*c^3
*d*g^3*n)*B^2)*log((b*x + a)^n) - ((b*c*d^3*g^3*n - a*d^4*g^3*n)*B^2*x^3 +
3*(b*c^2*d^2*g^3*n - a*c*d^3*g^3*n)*B^2*x^2 + 3*(b*c^3*d*g^3*n - a*c^2*d^2*
g^3*n)*B^2*x + (b*c^4*g^3*n - a*c^3*d*g^3*n)*B^2)*log((d*x + c)^n)), x)
```

Fricas [B] time = 0.897675, size = 1648, normalized size = 6.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
fricas")
```

```
[Out] ((A*b*d^2*x^2 + 2*A*b*c*d*x + A*b*c^2 + (B*b*d^2*x^2 + 2*B*b*c*d*x + B*b*c^
2)*log(e) + (B*b*d^2*n*x^2 + 2*B*b*c*d*n*x + B*b*c^2*n)*log((b*x + a)/(d*x
+ c)))*e^((B*log(e) + A)/(B*n))*log_integral((b*x + a)*e^((B*log(e) + A)/(B
*n))/(d*x + c)) - ((B*b^2*c - B*a*b*d)*n*x + (B*a*b*c - B*a^2*d)*n)*e^(2*(B
*log(e) + A)/(B*n)) - 2*(A*d^3*x^2 + 2*A*c*d^2*x + A*c^2*d + (B*d^3*x^2 + 2
*B*c*d^2*x + B*c^2*d)*log(e) + (B*d^3*n*x^2 + 2*B*c*d^2*n*x + B*c^2*d*n)*lo
g((b*x + a)/(d*x + c)))*log_integral((b^2*x^2 + 2*a*b*x + a^2)*e^(2*(B*log(
e) + A)/(B*n))/(d^2*x^2 + 2*c*d*x + c^2)))*e^(-2*(B*log(e) + A)/(B*n))/((A*
B^2*b^2*c^2*d^2 - 2*A*B^2*a*b*c*d^3 + A*B^2*a^2*d^4)*g^3*n^2*x^2 + 2*(A*B^2
*b^2*c^3*d - 2*A*B^2*a*b*c^2*d^2 + A*B^2*a^2*c*d^3)*g^3*n^2*x + (A*B^2*b^2*
c^4 - 2*A*B^2*a*b*c^3*d + A*B^2*a^2*c^2*d^2)*g^3*n^2 + ((B^3*b^2*c^2*d^2 -
2*B^3*a*b*c*d^3 + B^3*a^2*d^4)*g^3*n^2*x^2 + 2*(B^3*b^2*c^3*d - 2*B^3*a*b*c
^2*d^2 + B^3*a^2*c*d^3)*g^3*n^2*x + (B^3*b^2*c^4 - 2*B^3*a*b*c^3*d + B^3*a^
2*c^2*d^2)*g^3*n^2)*log(e) + ((B^3*b^2*c^2*d^2 - 2*B^3*a*b*c*d^3 + B^3*a^2*
```

```
d^4)*g^3*n^3*x^2 + 2*(B^3*b^2*c^3*d - 2*B^3*a*b*c^2*d^2 + B^3*a^2*c*d^3)*g^
3*n^3*x + (B^3*b^2*c^4 - 2*B^3*a*b*c^3*d + B^3*a^2*c^2*d^2)*g^3*n^3)*log((b
*x + a)/(d*x + c)))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(dgx+cg)^3 \left(B \log \left(e \left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*g*x+c*g)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((d*g*x + c*g)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

3.57 $\int (f+gx)^4 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=364

$$-\frac{Bg^2nx^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+\frac{Bgnx(bc-ad)\left(-a^2bd^2g^2(5df-cg)+a^3d^3\right.}{}$$

```
[Out] (B*(b*c - a*d)*g*(a^3*d^3*g^3 - a^2*b*d^2*g^2*(5*d*f - c*g) + a*b^2*d*g*(10
*d^2*f^2 - 5*c*d*f*g + c^2*g^2) - b^3*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*
d*f*g^2 - c^3*g^3))*n*x)/(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*
b*d*g*(5*d*f - c*g) + b^2*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*n*x^2)/(10*b^
3*d^3) - (B*(b*c - a*d)*g^3*(5*b*d*f - b*c*g - a*d*g)*n*x^3)/(15*b^2*d^2) -
 (B*(b*c - a*d)*g^4*n*x^4)/(20*b*d) - (B*(b*f - a*g)^5*n*Log[a + b*x])/(5*b
^5*g) + ((f + g*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*g) + (B*(d*
f - c*g)^5*n*Log[c + d*x])/(5*d^5*g)
```

Rubi [A] time = 0.602933, antiderivative size = 348, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$-\frac{Bg^2nx^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+\frac{Bgnx\left(-10a^2b^2d^4f^2g+5a^3bd^4fg^2-a^4d^4g\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (B*g*(10*a*b^3*d^4*f^3 - 10*a^2*b^2*d^4*f^2*g + 5*a^3*b*d^4*f*g^2 - a^4*d^4
*g^3 - b^4*c*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*d*f*g^2 - c^3*g^3))*n*x)/
(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*d*g*(5*d*f - c*g) + b^2
*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*n*x^2)/(10*b^3*d^3) - (B*(b*c - a*d)*g
^3*(5*b*d*f - b*c*g - a*d*g)*n*x^3)/(15*b^2*d^2) - (B*(b*c - a*d)*g^4*n*x^4
)/(20*b*d) - (B*(b*f - a*g)^5*n*Log[a + b*x])/(5*b^5*g) + ((f + g*x)^5*(A +
 B*Log[e*((a + b*x)/(c + d*x))^n]))/(5*g) + (B*(d*f - c*g)^5*n*Log[c + d*x]
)/(5*d^5*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{(f+gx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5g} - \frac{(Bn)\int \frac{(bc-ad)(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5g} - \frac{(B(bc-ad)n)\int \frac{(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{5g} - \frac{(B(bc-ad)n)\int \left(\frac{g^2\left(-a^3d^3g^3+a^2bd^2g^2(5df\right.}{\ldots}\right.}{\ldots}$$

$$= \frac{B(bc-ad)g\left(a^3d^3g^3-a^2bd^2g^2(5df-cg)+ab^2dg\left(10d^2f^2-5cdfg+c^2g^2\right.\right.}{5b^4d^4}$$

Mathematica [A] time = 0.649985, size = 285, normalized size = 0.78

$$\frac{\frac{Bg^2nx(ad-bc)\left(6a^2bd^2g^2(-2cg+10df+dgx)-12a^3d^3g^3-2ab^2dg\left(6c^2g^2-3cdg(10f+gx)+d^2\left(60f^2+15fgx+2g^2x^2\right)\right)+b^3\left(6c^2dg^2(10f+gx)-12c^3g^3-2cd^2g\left(60f^2+15f\right.\right.}{12b^4d^4}}{5g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((B*(-(b*c) + a*d)*g^2*n*x*(-12*a^3*d^3*g^3 + 6*a^2*b*d^2*g^2*(10*d*f - 2*c
*g + d*g*x) - 2*a*b^2*d*g*(6*c^2*g^2 - 3*c*d*g*(10*f + g*x) + d^2*(60*f^2 +
 15*f*g*x + 2*g^2*x^2)) + b^3*(-12*c^3*g^3 + 6*c^2*d*g^2*(10*f + g*x) - 2*c
*d^2*g*(60*f^2 + 15*f*g*x + 2*g^2*x^2) + d^3*(120*f^3 + 60*f^2*g*x + 20*f*g
^2*x^2 + 3*g^3*x^3))))/(12*b^4*d^4) - (B*(b*f - a*g)^5*n*Log[a + b*x])/b^5
+ (f + g*x)^5*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + (B*(d*f - c*g)^5*n*L
og[c + d*x])/d^5)/(5*g)
```

Maple [F] time = 0.438, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{4}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((g*x+f)^4*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 1.26038, size = 852, normalized size = 2.34

$$\frac{1}{5}\,Bg^{4}x^{5}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+\frac{1}{5}\,Ag^{4}x^{5}+Bfg^{3}x^{4}\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^{n}\right)+Afg^{3}x^{4}+2\,Bf^{2}g^{2}x^{3}\log\left(e\left(\frac{bx}{dx+c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/5*B*g^4*x^5*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/5*A*g^4*x^5 + B*f*
g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f*g^3*x^4 + 2*B*f^2*g^2*
x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*f^2*g^2*x^3 + 2*B*f^3*g*x^
2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 2*A*f^3*g*x^2 + 1/60*B*g^4*n*(12
*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4
)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 -
 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4)) - 1/6*B*f*g^3*n*(6*a^4*log(b*x + a)/b
^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d
 - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3)) + B*f^2*g^2*n*(2*a^
```

```
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*B*f^3*g*n*(a^2*log(b*x + a)/b^2 - c^2
*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f^4*n*(a*log(b*x + a)/b - c*lo
g(d*x + c)/d) + B*f^4*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f^4*x
```

Fricas [B] time = 3.13323, size = 1488, normalized size = 4.09

$$\frac{12\,Ab^5d^5g^4x^5 + 3\left(20\,Ab^5d^5fg^3 - \left(Bb^5cd^4 - Bab^4d^5\right)g^4n\right)x^4 + 4\left(30\,Ab^5d^5f^2g^2 - \left(5\left(Bb^5cd^4 - Bab^4d^5\right)fg^3 - \left(Bb^5c^2d^3\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 3*(20*A*b^5*d^5*f*g^3 - (B*b^5*c*d^4 - B*a*b^4
*d^5)*g^4*n)*x^4 + 4*(30*A*b^5*d^5*f^2*g^2 - (5*(B*b^5*c*d^4 - B*a*b^4*d^5)
*f*g^3 - (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*g^4)*n)*x^3 + 6*(20*A*b^5*d^5*f^3*
g - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*f^2*g^2 - 5*(B*b^5*c^2*d^3 - B*a^2*b^3*
d^5)*f*g^3 + (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g^4)*n)*x^2 + 12*(5*B*a*b^4*d^
5*f^4 - 10*B*a^2*b^3*d^5*f^3*g + 10*B*a^3*b^2*d^5*f^2*g^2 - 5*B*a^4*b*d^5*f
*g^3 + B*a^5*d^5*g^4)*n*log(b*x + a) - 12*(5*B*b^5*c*d^4*f^4 - 10*B*b^5*c^2
*d^3*f^3*g + 10*B*b^5*c^3*d^2*f^2*g^2 - 5*B*b^5*c^4*d*f*g^3 + B*b^5*c^5*g^4
)*n*log(d*x + c) + 12*(5*A*b^5*d^5*f^4 - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*f^
3*g - 10*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f^2*g^2 + 5*(B*b^5*c^3*d^2 - B*a^3
*b^2*d^5)*f*g^3 - (B*b^5*c^4*d - B*a^4*b*d^5)*g^4)*n)*x + 12*(B*b^5*d^5*g^4
*x^5 + 5*B*b^5*d^5*f*g^3*x^4 + 10*B*b^5*d^5*f^2*g^2*x^3 + 10*B*b^5*d^5*f^3*
g*x^2 + 5*B*b^5*d^5*f^4*x)*log(e) + 12*(B*b^5*d^5*g^4*n*x^5 + 5*B*b^5*d^5*f
*g^3*n*x^4 + 10*B*b^5*d^5*f^2*g^2*n*x^3 + 10*B*b^5*d^5*f^3*g*n*x^2 + 5*B*b^
5*d^5*f^4*n*x)*log((b*x + a)/(d*x + c)))/(b^5*d^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**4*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

3.58 $\int (f+gx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right) dx$

Optimal. Leaf size=235

$$-\frac{Bgnx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g}-Bg^2nx^2$$

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*n*x)/(4*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g
 - a*d*g)*n*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*g^3*n*x^3)/(12*b*d) - (B*(b*f
 - a*g)^4*n*Log[a + b*x])/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(4*g) + (B*(d*f - c*g)^4*n*Log[c + d*x])/(4*d^4*g)
```

Rubi [A] time = 0.359478, antiderivative size = 235, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$-\frac{Bgnx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{4g}-Bg^2nx^2$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```


```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*n*x)/(4*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g
 - a*d*g)*n*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*g^3*n*x^3)/(12*b*d) - (B*(b*f
 - a*g)^4*n*Log[a + b*x])/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[e*((a + b*x)/
(c + d*x))^n]))/(4*g) + (B*(d*f - c*g)^4*n*Log[c + d*x])/(4*d^4*g)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx=\frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4g}-\frac{(Bn)\int\frac{(bc-ad)(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$=\frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4g}-\frac{(B(bc-ad)n)\int\frac{(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$=\frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{4g}-\frac{(B(bc-ad)n)\int\left(\frac{g^2\left(a^2d^2g^2-abdg(4df-cg)+b^2\right.}{b^3d^3}\right.}{}$$

$$=-\frac{B(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)nx}{4b^3d^3}-$$

Mathematica [A] time = 0.28813, size = 219, normalized size = 0.93

$$\frac{(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn\left(6bdg^2x(bc-ad)\left(a^2d^2g^2+abdg(cg-4df)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)+3b^2d^2g^3x^2(bc-ad)(-adg-bcg+4bdf)+2b^3d^3\right.}{6b^4d^4}}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (B*n*(6*b*d*(b*c - a*
d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g +
 c^2*g^2))*x + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2 + 2*
b^3*d^3*(b*c - a*d)*g^4*x^3 + 6*d^4*(b*f - a*g)^4*Log[a + b*x] - 6*b^4*(d*f
```

```
- c*g)^4*Log[c + d*x]))/(6*b^4*d^4))/(4*g)
```

Maple [F] time = 0.403, size = 0, normalized size = 0.

$$\int (gx+f)^3 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((g*x+f)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 1.20435, size = 598, normalized size = 2.54

$$\frac{1}{4}Bg^3x^4\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{4}Ag^3x^4+Bfg^2x^3\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Afg^2x^3+\frac{3}{2}Bf^2gx^2\log\left(e\left(\frac{bx}{dx+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/4*B*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A*g^3*x^4 + B*f*
g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f*g^2*x^3 + 3/2*B*f^2*g*
x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A*f^2*g*x^2 - 1/24*B*g^3*n
*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d
^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3
)) + 1/2*B*f*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2
*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3/2*B*f^2*g*n*(
a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f^3*
n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*f^3*x*log(e*(b*x/(d*x + c) + a/
(d*x + c))^n) + A*f^3*x
```

Fricas [B] time = 1.50081, size = 1053, normalized size = 4.48

$$6\,Ab^4d^4g^3x^4+2\left(12\,Ab^4d^4fg^2-\left(Bb^4cd^3-Bab^3d^4\right)g^3n\right)x^3+3\left(12\,Ab^4d^4f^2g-\left(4\left(Bb^4cd^3-Bab^3d^4\right)fg^2-\left(Bb^4c^2d^2-\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 + 2*(12*A*b^4*d^4*f*g^2 - (B*b^4*c*d^3 - B*a*b^3*
d^4)*g^3*n)*x^3 + 3*(12*A*b^4*d^4*f^2*g - (4*(B*b^4*c*d^3 - B*a*b^3*d^4)*f*
g^2 - (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g^3)*n)*x^2 + 6*(4*B*a*b^3*d^4*f^3 -
6*B*a^2*b^2*d^4*f^2*g + 4*B*a^3*b*d^4*f*g^2 - B*a^4*d^4*g^3)*n*log(b*x + a)
 - 6*(4*B*b^4*c*d^3*f^3 - 6*B*b^4*c^2*d^2*f^2*g + 4*B*b^4*c^3*d*f*g^2 - B*b
^4*c^4*g^3)*n*log(d*x + c) + 6*(4*A*b^4*d^4*f^3 - (6*(B*b^4*c*d^3 - B*a*b^3
*d^4)*f^2*g - 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*f*g^2 + (B*b^4*c^3*d - B*a^
3*b*d^4)*g^3)*n)*x + 6*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*d^4*f*g^2*x^3 + 6*B*b^4
*d^4*f^2*g*x^2 + 4*B*b^4*d^4*f^3*x)*log(e) + 6*(B*b^4*d^4*g^3*n*x^4 + 4*B*b
^4*d^4*f*g^2*n*x^3 + 6*B*b^4*d^4*f^2*g*n*x^2 + 4*B*b^4*d^4*f^3*n*x)*log((b*
x + a)/(d*x + c)))/(b^4*d^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] Timed out
```

3.59 $\int (f+gx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\,dx$

Optimal. Leaf size=157

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g}-\frac{Bgnx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{Bn(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2nx^2(bc-ad)}{6bd}$$

```
[Out] -(B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*g^2*n*x^2)/(6*b*d) - (B*(b*f - a*g)^3*n*Log[a + b*x])/(3*b^3*g) + ((f +
g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*g) + (B*(d*f - c*g)^3*n*L
og[c + d*x])/(3*d^3*g)
```

Rubi [A] time = 0.180485, antiderivative size = 157, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{3g}-\frac{Bgnx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{Bn(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2nx^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*g^2*n*x^2)/(6*b*d) - (B*(b*f - a*g)^3*n*Log[a + b*x])/(3*b^3*g) + ((f +
g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*g) + (B*(d*f - c*g)^3*n*L
og[c + d*x])/(3*d^3*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g} - \frac{(Bn)\int\frac{(bc-ad)(f+gx)^3}{(a+bx)(c+dx)}\,dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g} - \frac{(B(bc-ad)n)\int\frac{(f+gx)^3}{(a+bx)(c+dx)}\,dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3g} - \frac{(B(bc-ad)n)\int\left(\frac{g^2(3bdf-bcg-adg)}{b^2d^2}+\frac{g^3x}{bd}\right.}{3g}$$

$$= -\frac{B(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{B(bc-ad)g^2nx^2}{6bd} - \frac{B(bf-ag)^3n\log(}{3b^3g}$$

Mathematica [A] time = 0.143738, size = 146, normalized size = 0.93

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)-\frac{Bn\left(b^2d^2g^3x^2(bc-ad)+2bdg^2x(bc-ad)(-adg-bcg+3bdf)+2d^3(bf-ag)^3\log(a+bx)-2b^3(df-cg)^3\log(c+dx)\right)}{2b^3d^3}}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - (B*n*(2*b*d*(b*c - a*
d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + b^2*d^2*(b*c - a*d)*g^3*x^2 + 2*d^3*(b
*f - a*g)^3*Log[a + b*x] - 2*b^3*(d*f - c*g)^3*Log[c + d*x]))/(2*b^3*d^3))/
(3*g)
```

Maple [F] time = 0.41, size = 0, normalized size = 0.

$$\int (gx+f)^2 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((g*x+f)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 1.18207, size = 381, normalized size = 2.43

$$\frac{1}{3}Bg^2x^3\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{3}Ag^2x^3+Bfgx^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+Afgx^2+\frac{1}{6}Bg^2n\left(\frac{2a^3\log(bx+a}{b^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/3*B*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A*g^2*x^3 + B*f*
g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f*g*x^2 + 1/6*B*g^2*n*(2*a
^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2
*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - B*f*g*n*(a^2*log(b*x + a)/b^2 - c^2*lo
g(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f^2*n*(a*log(b*x + a)/b - c*log(d
*x + c)/d) + B*f^2*x*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A*f^2*x
```

Fricas [B] time = 1.20537, size = 695, normalized size = 4.43

$$\frac{2\,Ab^3d^3g^2x^3+\left(6\,Ab^3d^3fg-\left(Bb^3cd^2-Bab^2d^3\right)g^2n\right)x^2+2\left(3\,Bab^2d^3f^2-3\,Ba^2bd^3fg+Ba^3d^3g^2\right)n\log(bx+a)-2\,(3\,\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 + (6*A*b^3*d^3*f*g - (B*b^3*c*d^2 - B*a*b^2*d^3)*g
^2*n)*x^2 + 2*(3*B*a*b^2*d^3*f^2 - 3*B*a^2*b*d^3*f*g + B*a^3*d^3*g^2)*n*log
```

```
(b*x + a) - 2*(3*B*b^3*c*d^2*f^2 - 3*B*b^3*c^2*d*f*g + B*b^3*c^3*g^2)*n*log
(d*x + c) + 2*(3*A*b^3*d^3*f^2 - (3*(B*b^3*c*d^2 - B*a*b^2*d^3)*f*g - (B*b^
3*c^2*d - B*a^2*b*d^3)*g^2)*n)*x + 2*(B*b^3*d^3*g^2*x^3 + 3*B*b^3*d^3*f*g*x
^2 + 3*B*b^3*d^3*f^2*x)*log(e) + 2*(B*b^3*d^3*g^2*n*x^3 + 3*B*b^3*d^3*f*g*n
*x^2 + 3*B*b^3*d^3*f^2*n*x)*log((b*x + a)/(d*x + c)))/(b^3*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 81.8263, size = 366, normalized size = 2.33

$$\frac{1}{3}\left(Ag^2 + Bg^2\right)x^3 + \frac{1}{3}\left(Bg^2nx^3 + 3\,Bfgnx^2 + 3\,Bf^2nx\right)\log\left(\frac{bx+a}{dx+c}\right) - \frac{\left(Bbcg^2n - Badg^2n - 6\,Abdfg - 6\,Bbdfg\right)x^2}{6\,bd} + \frac{(3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/3*(A*g^2 + B*g^2)*x^3 + 1/3*(B*g^2*n*x^3 + 3*B*f*g*n*x^2 + 3*B*f^2*n*x)*l
og((b*x + a)/(d*x + c)) - 1/6*(B*b*c*g^2*n - B*a*d*g^2*n - 6*A*b*d*f*g - 6*
B*b*d*f*g)*x^2/(b*d) + 1/3*(3*B*a*b^2*f^2*n - 3*B*a^2*b*f*g*n + B*a^3*g^2*n
)*log(b*x + a)/b^3 - 1/3*(3*B*c*d^2*f^2*n - 3*B*c^2*d*f*g*n + B*c^3*g^2*n)*
log(-d*x - c)/d^3 - 1/3*(3*B*b^2*c*d*f*g*n - 3*B*a*b*d^2*f*g*n - B*b^2*c^2*
g^2*n + B*a^2*d^2*g^2*n - 3*A*b^2*d^2*f^2 - 3*B*b^2*d^2*f^2)*x/(b^2*d^2)
```

3.60 $\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=115

$$\frac{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g}-\frac{Bn(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgnx(bc-ad)}{2bd}+\frac{Bn(df-cg)^2\log(c+dx)}{2d^2g}$$

```
[Out] -(B*(b*c - a*d)*g*n*x)/(2*b*d) - (B*(b*f - a*g)^2*n*Log[a + b*x])/(2*b^2*g)
 + ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*g) + (B*(d*f - c
*g)^2*n*Log[c + d*x])/(2*d^2*g)
```

Rubi [A] time = 0.104979, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{2g}-\frac{Bn(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgnx(bc-ad)}{2bd}+\frac{Bn(df-cg)^2\log(c+dx)}{2d^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] -(B*(b*c - a*d)*g*n*x)/(2*b*d) - (B*(b*f - a*g)^2*n*Log[a + b*x])/(2*b^2*g)
 + ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*g) + (B*(d*f - c
*g)^2*n*Log[c + d*x])/(2*d^2*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2g} - \frac{(Bn)\int \frac{(bc-ad)(f+gx)^2}{(a+bx)(c+dx)}\,dx}{2g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2g} - \frac{(B(bc-ad)n)\int \frac{(f+gx)^2}{(a+bx)(c+dx)}\,dx}{2g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{2g} - \frac{(B(bc-ad)n)\int \left(\frac{g^2}{bd} + \frac{(bf-ag)^2}{b(bc-ad)(a+bx)} + \frac{}{d(-}\right.}{2g}$$

$$= -\frac{B(bc-ad)gnx}{2bd} - \frac{B(bf-ag)^2 n\log(a+bx)}{2b^2g} + \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{2g}$$

Mathematica [A] time = 0.128372, size = 120, normalized size = 1.04

$$\frac{b\left(d\left(Bg^2nx(ad-bc)+Abd(f+gx)^2\right)+bBd^2(f+gx)^2\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+bBn(df-cg)^2\log(c+dx)\right)-Bd^2n(bf-ag)^2\,\mathrm{lo}}{2b^2d^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] (-(B*d^2*(b*f - a*g)^2*n*Log[a + b*x]) + b*(d*(B*(-(b*c) + a*d)*g^2*n*x + A
*b*d*(f + g*x)^2) + b*B*d^2*(f + g*x)^2*Log[e*((a + b*x)/(c + d*x))^n] + b*
B*(d*f - c*g)^2*n*Log[c + d*x]))/(2*b^2*d^2*g)
```

Maple [F] time = 0.32, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 1.09531, size = 203, normalized size = 1.77

$$\frac{1}{2}Bgx^2\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)+\frac{1}{2}Agx^2-\frac{1}{2}Bgn\left(\frac{a^2\log(bx+a)}{b^2}-\frac{c^2\log(dx+c)}{d^2}+\frac{(bc-ad)x}{bd}\right)+Bfn\left(\frac{a\log(bx}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] 1/2*B*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A*g*x^2 - 1/2*B*g*
n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + B*f
*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*f*x*log(e*(b*x/(d*x + c) + a/(
d*x + c))^n) + A*f*x
```

Fricas [A] time = 0.925426, size = 390, normalized size = 3.39

$$\frac{Ab^2d^2gx^2+\left(2\,Babd^2f-Ba^2d^2g\right)n\log(bx+a)-\left(2\,Bb^2cdf-Bb^2c^2g\right)n\log(dx+c)+\left(2\,Ab^2d^2f-\left(Bb^2cd-Babd^2\right)gn\right.}{2\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + (2*B*a*b*d^2*f - B*a^2*d^2*g)*n*log(b*x + a) - (2*B*
b^2*c*d*f - B*b^2*c^2*g)*n*log(d*x + c) + (2*A*b^2*d^2*f - (B*b^2*c*d - B*a
*b*d^2)*g*n)*x + (B*b^2*d^2*g*x^2 + 2*B*b^2*d^2*f*x)*log(e) + (B*b^2*d^2*g*
n*x^2 + 2*B*b^2*d^2*f*n*x)*log((b*x + a)/(d*x + c)))/(b^2*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 5.30086, size = 182, normalized size = 1.58

$$\frac{1}{2}\left(Ag+Bg\right)x^2+\frac{1}{2}\left(Bgnx^2+2\,Bfnx\right)\log\left(\frac{bx+a}{dx+c}\right)-\frac{\left(Bbcgn-Badgn-2\,Abdf-2\,Bbdf\right)x}{2\,bd}+\frac{\left(2\,Babfn-Ba^2gn\right)\log\left(\right.}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] 1/2*(A*g + B*g)*x^2 + 1/2*(B*g*n*x^2 + 2*B*f*n*x)*log((b*x + a)/(d*x + c))
- 1/2*(B*b*c*g*n - B*a*d*g*n - 2*A*b*d*f - 2*B*b*d*f)*x/(b*d) + 1/2*(2*B*a*
b*f*n - B*a^2*g*n)*log(b*x + a)/b^2 - 1/2*(2*B*c*d*f*n - B*c^2*g*n)*log(-d*
x - c)/d^2
```

3.61 $\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx$

Optimal. Leaf size=56

$$\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b - (B*(b*c - a*d)*n*Log
[c + d*x])/(b*d)
```

Rubi [A] time = 0.0327508, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[e*((a + b*x)/(c + d*x))^n],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b - (B*(b*c - a*d)*n*Log
[c + d*x])/(b*d)
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)dx = Ax+B\int \log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)dx$$
$$= Ax+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{(B(bc-ad)n)\int \frac{1}{c+dx}dx}{b}$$
$$= Ax+\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{B(bc-ad)n\log(c+dx)}{bd}$$

Mathematica [A] time = 0.0090986, size = 56, normalized size = 1.

$$\frac{B(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[e*((a + b*x)/(c + d*x))^n],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/b - (B*(b*c - a*d)*n*Log
[c + d*x])/(b*d)
```

Maple [B] time = 0.049, size = 122, normalized size = 2.2

$$Ax+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)x+\frac{Bna^2\ln(bx+a)d}{b(ad-bc)}-\frac{Bna\ln(bx+a)c}{ad-bc}-\frac{Bnc\ln(dx+c)a}{ad-bc}+\frac{Bnc^2\ln(dx+c)b}{d(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A+B*ln(e*((b*x+a)/(d*x+c))^n),x)
```

```
[Out] A*x+B*ln(e*((b*x+a)/(d*x+c))^n)*x+B*n*a^2/(a*d-b*c)/b*ln(b*x+a)*d-B*n*a/(a*
d-b*c)*ln(b*x+a)*c-B*n*c/(a*d-b*c)*ln(d*x+c)*a+B*n*c^2/(a*d-b*c)/d*ln(d*x+c
)*b
```

Maxima [A] time = 1.17749, size = 70, normalized size = 1.25

$$Bn\left(\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)+Bx\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*((b*x+a)/(d*x+c))^n),x, algorithm="maxima")
```

```
[Out] B*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + B*x*log(e*((b*x + a)/(d*x + c))
^n) + A*x
```

Fricas [A] time = 0.841066, size = 158, normalized size = 2.82

$$\frac{Bbdnx\log\left(\frac{bx+a}{dx+c}\right)+Badn\log(bx+a)-Bbcn\log(dx+c)+Bbdx\log(e)+Abdx}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*((b*x+a)/(d*x+c))^n),x, algorithm="fricas")
```

```
[Out] (B*b*d*n*x*log((b*x + a)/(d*x + c)) + B*a*d*n*log(b*x + a) - B*b*c*n*log(d*
x + c) + B*b*d*x*log(e) + A*b*d*x)/(b*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*((b*x+a)/(d*x+c))**n),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.39047, size = 72, normalized size = 1.29

$$\left(nx\log\left(\frac{bx+a}{dx+c}\right)+\frac{an\log(bx+a)}{b}-\frac{cn\log(-dx-c)}{d}+x\right)B+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*((b*x+a)/(d*x+c))^n),x, algorithm="giac")
```

```
[Out] (n*x*log((b*x + a)/(d*x + c)) + a*n*log(b*x + a)/b - c*n*log(-d*x - c)/d +
x)*B + A*x
```

3.62 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{f+gx}\,dx$

Optimal. Leaf size=147

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{Bn\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}-\frac{Bn\log(f+gx)\log\left(-\frac{g(a}{bf}\right.}{g}$$

```
[Out] -((B*n*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g) + ((A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[f + g*x])/g + (B*n*Log[-((g*(c + d*x))/(d*f -
c*g))]*Log[f + g*x])/g - (B*n*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (B
*n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Rubi [A] time = 0.225662, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {2524, 2418, 2394, 2393, 2391}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{Bn\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}-\frac{Bn\log(f+gx)\log\left(-\frac{g(a}{bf}\right.}{g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x),x]
```


```
[Out] -((B*n*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g) + ((A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[f + g*x])/g + (B*n*Log[-((g*(c + d*x))/(d*f -
c*g))]*Log[f + g*x])/g - (B*n*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (B
*n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```


Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{f+gx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} - \frac{(Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\log(f+gx)}{a+bx}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} - \frac{(Bn)\int\left(\frac{b\log(f+gx)}{a+bx}-\frac{d\log(f+gx)}{c+dx}\right)dx}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} - \frac{(bBn)\int\frac{\log(f+gx)}{a+bx}\,dx}{g} + \frac{(Bdn)\int\frac{\log(f+gx)}{c+dx}\,dx}{g}$$

$$= -\frac{Bn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} + \frac{Bn\log\left(-\frac{g(c+dx)}{df-cg}\right)}{g}$$

$$= -\frac{Bn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} + \frac{Bn\log\left(-\frac{g(c+dx)}{df-cg}\right)}{g}$$

$$= -\frac{Bn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{g} + \frac{Bn\log\left(-\frac{g(c+dx)}{df-cg}\right)}{g}$$

Mathematica [A] time = 0.0576367, size = 122, normalized size = 0.83

$$\frac{-Bn\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)+Bn\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)+\log(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)-Bn\log\left(\frac{g(a+bx)}{ag-bf}\right)+A+Bn\log\left(\right.\right.}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x),x]
```

```
[Out] ((A - B*n*Log[(g*(a + b*x))/(-(b*f) + a*g)] + B*Log[e*((a + b*x)/(c + d*x))
^n] + B*n*Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] - B*n*PolyLog[2,
(b*(f + g*x))/(b*f - a*g)] + B*n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Maple [F] time = 0.616, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B\int -\frac{\log\left((bx+a)^n\right)-\log\left((dx+c)^n\right)+\log(e)}{gx+f}\,dx+\frac{A\log\left(gx+f\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(g*x + f), x)
+ A*log(g*x + f)/g
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(g*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)/(g*x + f), x)
```

3.63 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^2}\,dx$

Optimal. Leaf size=91

$$\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{(f+gx)(bf-ag)}+\frac{Bn(bc-ad)\log\left(\frac{f+gx}{c+dx}\right)}{(bf-ag)(df-cg)}$$

```
[Out] ((a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*f - a*g)*(f + g*x))
+ (B*(b*c - a*d)*n*Log[(f + g*x)/(c + d*x)])/((b*f - a*g)*(d*f - c*g))
```

Rubi [A] time = 0.124769, antiderivative size = 119, normalized size of antiderivative = 1.31, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{g(f+gx)}+\frac{Bn(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}+\frac{bBn\log(a+bx)}{g(bf-ag)}-\frac{Bdn\log(c+dx)}{g(df-cg)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^2,x]
```

```
[Out] (b*B*n*Log[a + b*x])/(g*(b*f - a*g)) - (A + B*Log[e*((a + b*x)/(c + d*x))^n
])/(g*(f + g*x)) - (B*d*n*Log[c + d*x])/(g*(d*f - c*g)) + (B*(b*c - a*d)*n*
Log[f + g*x])/((b*f - a*g)*(d*f - c*g))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^2}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)} + \frac{(Bn)\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)} + \frac{(B(bc-ad)n)\int \left(\frac{b^2}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2}{(bc-ad)(-df+cg)(c+dx)} + \frac{}{(bf-}\right.}{g}$$

$$= \frac{bBn\log(a+bx)}{g(bf-ag)} - \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{g(f+gx)} - \frac{Bdn\log(c+dx)}{g(df-cg)} + \frac{B(bc-ad)n\log(f+gx)}{(bf-ag)(df-cg)}$$

Mathematica [A] time = 0.182617, size = 109, normalized size = 1.2

$$\frac{\frac{Bn(b\log(a+bx)(df-cg)+\log(c+dx)(adg-bdf)+g(bc-ad)\log(f+gx))}{(bf-ag)(df-cg)} - \frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{f+gx}}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)) + (B*n*(b*(d*f - c*g)*
Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]
))/((b*f - a*g)*(d*f - c*g)))/g
```

Maple [F] time = 0.513, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^2}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x)
```

Maxima [A] time = 1.184, size = 192, normalized size = 2.11

$$Bn\left(\frac{b\log(bx+a)}{bfg-ag^2}-\frac{d\log(dx+c)}{dfg-cg^2}+\frac{(bc-ad)\log(gx+f)}{bdf^2+acg^2-(bc+ad)fg}\right)-\frac{B\log\left(e\left(\frac{bx}{dx+c}+\frac{a}{dx+c}\right)^n\right)}{g^2x+fg}-\frac{A}{g^2x+fg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] B*n*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) + (b*c
 - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g)) - B*log(e*(b*x/
(d*x + c) + a/(d*x + c))^n)/(g^2*x + f*g) - A/(g^2*x + f*g)
```

Fricas [B] time = 17.4685, size = 652, normalized size = 7.16

$$-\frac{Abdf^2+Aacg^2-(Abc+Aad)fg+\left(Bbdf^2+Bacg^2-(Bbc+Bad)fg\right)n\log\left(\frac{bx+a}{dx+c}\right)-\left(\left(Bbdfg-Bbcg^2\right)nx+\left(Bbdf^2-\right.\right.}{bdf}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] -(A*b*d*f^2 + A*a*c*g^2 - (A*b*c + A*a*d)*f*g + (B*b*d*f^2 + B*a*c*g^2 - (B
*b*c + B*a*d)*f*g)*n*log((b*x + a)/(d*x + c)) - ((B*b*d*f*g - B*b*c*g^2)*n*
x + (B*b*d*f^2 - B*b*c*f*g)*n)*log(b*x + a) + ((B*b*d*f*g - B*a*d*g^2)*n*x
+ (B*b*d*f^2 - B*a*d*f*g)*n)*log(d*x + c) - ((B*b*c - B*a*d)*g^2*n*x + (B*b
*c - B*a*d)*f*g*n)*log(g*x + f) + (B*b*d*f^2 + B*a*c*g^2 - (B*b*c + B*a*d)*
f*g)*log(e))/(b*d*f^3*g + a*c*f*g^3 - (b*c + a*d)*f^2*g^2 + (b*d*f^2*g^2 +
a*c*g^4 - (b*c + a*d)*f*g^3)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.33159, size = 390, normalized size = 4.29

$$-\frac{Bn\log\left(\frac{bx+a}{dx+c}\right)}{g^2x+fg}+\frac{(Bbcn-Badn)\log\left(gx+f\right)}{bdf^2-bcfg-adfg+acg^2}-\frac{(Bbcn-Badn)\log\left(\left|bdx^2+bcx+adx+ac\right|\right)}{2\left(bdf^2-bcfg-adfg+acg^2\right)}-\frac{A+B}{g^2x+fg}+\frac{\left(2\,Bb^2cdf\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] -B*n*log((b*x + a)/(d*x + c))/(g^2*x + f*g) + (B*b*c*n - B*a*d*n)*log(g*x +
 f)/(b*d*f^2 - b*c*f*g - a*d*f*g + a*c*g^2) - 1/2*(B*b*c*n - B*a*d*n)*log(a
bs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b*d*f^2 - b*c*f*g - a*d*f*g + a*c*g^2)
- (A + B)/(g^2*x + f*g) + 1/2*(2*B*b^2*c*d*f*n - 2*B*a*b*d^2*f*n - B*b^2*c^
2*g*n + B*a^2*d^2*g*n)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b
*d*x + b*c + a*d + abs(-b*c + a*d))))/((b*d*f^2*g - b*c*f*g^2 - a*d*f*g^2 +
 a*c*g^3)*abs(-b*c + a*d))
```

3.64 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^3}\,dx$

Optimal. Leaf size=190

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2g(f+gx)^2}+\frac{b^2Bn\log(a+bx)}{2g(bf-ag)^2}-\frac{Bn(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+2bd}{2(bf-ag)^2(df-cg)^2}$$

```
[Out] -(B*(b*c - a*d)*n)/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*n*Log[a +
 b*x])/(2*g*(b*f - a*g)^2) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(2*g*(f
 + g*x)^2) - (B*d^2*n*Log[c + d*x])/(2*g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2
*b*d*f - b*c*g - a*d*g)*n*Log[f + g*x])/(2*(b*f - a*g)^2*(d*f - c*g)^2)
```

Rubi [A] time = 0.235799, antiderivative size = 190, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{2g(f+gx)^2}+\frac{b^2Bn\log(a+bx)}{2g(bf-ag)^2}-\frac{Bn(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+2bd}{2(bf-ag)^2(df-cg)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^3,x]
```

```
[Out] -(B*(b*c - a*d)*n)/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*n*Log[a +
 b*x])/(2*g*(b*f - a*g)^2) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])/(2*g*(f
 + g*x)^2) - (B*d^2*n*Log[c + d*x])/(2*g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2
*b*d*f - b*c*g - a*d*g)*n*Log[f + g*x])/(2*(b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^3}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}+\frac{(Bn)\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}+\frac{(B(bc-ad)n)\int \left(\frac{b^3}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3}{(bc-ad)(-df+cg)^2(c+dx)}+\frac{}{(b\ldots}\right.}{2g}$$

$$= -\frac{B(bc-ad)n}{2(bf-ag)(df-cg)(f+gx)}+\frac{b^2Bn\log(a+bx)}{2g(bf-ag)^2}-\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{2g(f+gx)^2}-\frac{Bd^2n\log(c\ldots}{2g(df-\ldots}$$

Mathematica [A] time = 0.69519, size = 173, normalized size = 0.91

$$\frac{Bn(bc-ad)\left(\frac{b^2\log(a+bx)}{(bc-ad)(bf-ag)^2}+\frac{\frac{d^2\log(c+dx)}{ad-bc}+\frac{g(cg-df)}{(f+gx)(bf-ag)}-\frac{g\log(f+gx)(adg+bcg-2bdf)}{(bf-ag)^2}}{(df-cg)^2}\right)-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{(f+gx)^2}}{2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^3,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^2) + B*(b*c - a*d)*n*((
b^2*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + ((g*(-(d*f) + c*g))/((b*f -
 a*g)*(f + g*x)) + (d^2*Log[c + d*x])/(-(b*c) + a*d) - (g*(-2*b*d*f + b*c*g
```

```
 + a*d*g)*Log[f + g*x])/(b*f - a*g)^2)/(d*f - c*g)^2))/(2*g)
```

Maple [F] time = 0.513, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x)
```

Maxima [A] time = 1.29185, size = 479, normalized size = 2.52

$$\frac{1}{2}\left(\frac{b^2\log(bx+a)}{b^2f^2g-2\,abfg^2+a^2g^3}-\frac{d^2\log(dx+c)}{d^2f^2g-2\,cdfg^2+c^2g^3}+\frac{\left(2\left(b^2cd-abd^2\right)f-\left(b^2c^2-a^2d^2\right)g\right)\log\left(gx\right.}{b^2d^2f^4+a^2c^2g^4-2\left(b^2cd+abd^2\right)f^3g+\left(b^2c^2+4\,abcd+a^2d^2\right)f}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c
)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2
 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d
^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)
*f*g^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g
 + a*c*g^3 - (b*c + a*d)*f*g^2)*x))*B*n - 1/2*B*log(e*(b*x/(d*x + c) + a/(d
*x + c))^n)/(g^3*x^2 + 2*f*g^2*x + f^2*g) - 1/2*A/(g^3*x^2 + 2*f*g^2*x + f^
2*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.88225, size = 1165, normalized size = 6.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] -1/2*B*n*log((b*x + a)/(d*x + c))/(g^3*x^2 + 2*f*g^2*x + f^2*g) + 1/2*(2*B*
b^2*c*d*f*n - 2*B*a*b*d^2*f*n - B*b^2*c^2*g*n + B*a^2*d^2*g*n)*log(g*x + f)
/(b^2*d^2*f^4 - 2*b^2*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b
*c*d*f^2*g^2 + a^2*d^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^
2*g^4) - 1/4*(2*B*b^2*c*d*f*n - 2*B*a*b*d^2*f*n - B*b^2*c^2*g*n + B*a^2*d^2
*g*n)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^2*d^2*f^4 - 2*b^2*c*d*f^3*
g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b*c*d*f^2*g^2 + a^2*d^2*f^2*g^2
 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^2*g^4) - 1/2*(B*b*c*g^2*n*x -
B*a*d*g^2*n*x + B*b*c*f*g*n - B*a*d*f*g*n + A*b*d*f^2 + B*b*d*f^2 - A*b*c*f
*g - B*b*c*f*g - A*a*d*f*g - B*a*d*f*g + A*a*c*g^2 + B*a*c*g^2)/(b*d*f^2*g^
3*x^2 - b*c*f*g^4*x^2 - a*d*f*g^4*x^2 + a*c*g^5*x^2 + 2*b*d*f^3*g^2*x - 2*b
*c*f^2*g^3*x - 2*a*d*f^2*g^3*x + 2*a*c*f*g^4*x + b*d*f^4*g - b*c*f^3*g^2 -
a*d*f^3*g^2 + a*c*f^2*g^3) + 1/4*(2*B*b^3*c*d^2*f^2*n - 2*B*a*b^2*d^3*f^2*n
 - 2*B*b^3*c^2*d*f*g*n + 2*B*a^2*b*d^3*f*g*n + B*b^3*c^3*g^2*n - B*a*b^2*c^
2*d*g^2*n + B*a^2*b*c*d^2*g^2*n - B*a^3*d^3*g^2*n)*log(abs((2*b*d*x + b*c +
 a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/((b^2*d^2
*f^4*g - 2*b^2*c*d*f^3*g^2 - 2*a*b*d^2*f^3*g^2 + b^2*c^2*f^2*g^3 + 4*a*b*c*
```

```
d*f^2*g^3 + a^2*d^2*f^2*g^3 - 2*a*b*c^2*f*g^4 - 2*a^2*c*d*f*g^4 + a^2*c^2*g
^5)*abs(-b*c + a*d))
```

3.65 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^4}\,dx$

Optimal. Leaf size=283

$$\frac{Bn(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3g(f+gx)^3}+\frac{b^3Bn\log(a}{3g(bf-}$$

```
[Out] -(B*(b*c - a*d)*n)/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (B*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g)*n)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (
b^3*B*n*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[e*((a + b*x)/(c + d*
x))^n])/(3*g*(f + g*x)^3) - (B*d^3*n*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2))*n*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rubi [A] time = 0.457508, antiderivative size = 283, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$\frac{Bn(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A}{3g(f+gx)^3}+\frac{b^3Bn\log(a}{3g(bf-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^4,x]
```

```
[Out] -(B*(b*c - a*d)*n)/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (B*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g)*n)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (
b^3*B*n*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[e*((a + b*x)/(c + d*
x))^n])/(3*g*(f + g*x)^3) - (B*d^3*n*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2))*n*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^4}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3g(f+gx)^3}+\frac{(Bn)\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3g(f+gx)^3}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{3g(f+gx)^3}+\frac{(B(bc-ad)n)\int\left(\frac{b^4}{(bc-ad)(bf-ag)^3(a+bx)}+\frac{d^4}{(bc-ad)(-df+cg)^3(c+dx)}+\frac{}{(bf-}\right.}{}$$

$$= -\frac{B(bc-ad)n}{6(bf-ag)(df-cg)(f+gx)^2}-\frac{B(bc-ad)(2bdf-bcg-adg)n}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^3Bn\log(a+bx)}{3g(bf-ag)^3}-\frac{A}{}$$

Mathematica [A] time = 1.02113, size = 264, normalized size = 0.93

$$\frac{Bn(bc-ad)\left(\frac{g\log(f+gx)\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(bf-ag)^3(df-cg)^3}+\frac{b^3\log(a+bx)}{(bc-ad)(bf-ag)^3}+\frac{d^3\log(c+dx)}{(bc-ad)(cg-df)^3}+\frac{g(adg+bcg-2bdf)}{(f+gx)(bf-ag)^2(df-cg)^2}-\frac{}{2(f+}\right.}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^4,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^3) + B*(b*c - a*d)*n*(-
g/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (g*(-2*b*d*f + b*c*g + a*d*g))/
((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*Log[a + b*x])/((b*c - a*d)*(
b*f - a*g)^3) + (d^3*Log[c + d*x])/((b*c - a*d)*(-(d*f) + c*g)^3) + (g*(a^2
*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*
Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(3*g)
```

Maple [F] time = 0.507, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{4}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x)
```

Maxima [B] time = 1.54857, size = 1150, normalized size = 4.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
```

```
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x))*B*n - 1/3*B*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n)/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) - 1/3*A/(g
^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 3.99896, size = 2925, normalized size = 10.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] -1/3*B*n*log((b*x + a)/(d*x + c))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^
3*g) + 1/3*(3*B*b^3*c*d^2*f^2*n - 3*B*a*b^2*d^3*f^2*n - 3*B*b^3*c^2*d*f*g*n
 + 3*B*a^2*b*d^3*f*g*n + B*b^3*c^3*g^2*n - B*a^3*d^3*g^2*n)*log(g*x + f)/(b
^3*d^3*f^6 - 3*b^3*c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 +
```

9*a*b^2*c*d^2*f^4*g^2 + 3*a^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2
*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4
+ 9*a^2*b*c^2*d*f^2*g^4 + 3*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c
^2*d*f*g^5 + a^3*c^3*g^6) - 1/6*(3*B*b^3*c*d^2*f^2*n - 3*B*a*b^2*d^3*f^2*n
- 3*B*b^3*c^2*d*f*g*n + 3*B*a^2*b*d^3*f*g*n + B*b^3*c^3*g^2*n - B*a^3*d^3*g
^2*n)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^3*d^3*f^6 - 3*b^3*c*d^2*f^
5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 + 3*a
^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*
f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2*g^4 + 3
*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^3*g^6) -
1/6*(4*B*b^2*c*d*f*g^3*n*x^2 - 4*B*a*b*d^2*f*g^3*n*x^2 - 2*B*b^2*c^2*g^4*n
*x^2 + 2*B*a^2*d^2*g^4*n*x^2 + 9*B*b^2*c*d*f^2*g^2*n*x - 9*B*a*b*d^2*f^2*g^
2*n*x - 5*B*b^2*c^2*f*g^3*n*x + 5*B*a^2*d^2*f*g^3*n*x + B*a*b*c^2*g^4*n*x -
B*a^2*c*d*g^4*n*x + 5*B*b^2*c*d*f^3*g*n - 5*B*a*b*d^2*f^3*g*n - 3*B*b^2*c^
2*f^2*g^2*n + 3*B*a^2*d^2*f^2*g^2*n + B*a*b*c^2*f*g^3*n - B*a^2*c*d*f*g^3*n
+ 2*A*b^2*d^2*f^4 + 2*B*b^2*d^2*f^4 - 4*A*b^2*c*d*f^3*g - 4*B*b^2*c*d*f^3*
g - 4*A*a*b*d^2*f^3*g - 4*B*a*b*d^2*f^3*g + 2*A*b^2*c^2*f^2*g^2 + 2*B*b^2*c
^2*f^2*g^2 + 8*A*a*b*c*d*f^2*g^2 + 8*B*a*b*c*d*f^2*g^2 + 2*A*a^2*d^2*f^2*g^
2 + 2*B*a^2*d^2*f^2*g^2 - 4*A*a*b*c^2*f*g^3 - 4*B*a*b*c^2*f*g^3 - 4*A*a^2*c
*d*f*g^3 - 4*B*a^2*c*d*f*g^3 + 2*A*a^2*c^2*g^4 + 2*B*a^2*c^2*g^4)/(b^2*d^2*
f^4*g^4*x^3 - 2*b^2*c*d*f^3*g^5*x^3 - 2*a*b*d^2*f^3*g^5*x^3 + b^2*c^2*f^2*g
^6*x^3 + 4*a*b*c*d*f^2*g^6*x^3 + a^2*d^2*f^2*g^6*x^3 - 2*a*b*c^2*f*g^7*x^3
- 2*a^2*c*d*f*g^7*x^3 + a^2*c^2*g^8*x^3 + 3*b^2*d^2*f^5*g^3*x^2 - 6*b^2*c*d
*f^4*g^4*x^2 - 6*a*b*d^2*f^4*g^4*x^2 + 3*b^2*c^2*f^3*g^5*x^2 + 12*a*b*c*d*f
^3*g^5*x^2 + 3*a^2*d^2*f^3*g^5*x^2 - 6*a*b*c^2*f^2*g^6*x^2 - 6*a^2*c*d*f^2*
g^6*x^2 + 3*a^2*c^2*f*g^7*x^2 + 3*b^2*d^2*f^6*g^2*x - 6*b^2*c*d*f^5*g^3*x -
6*a*b*d^2*f^5*g^3*x + 3*b^2*c^2*f^4*g^4*x + 12*a*b*c*d*f^4*g^4*x + 3*a^2*d
^2*f^4*g^4*x - 6*a*b*c^2*f^3*g^5*x - 6*a^2*c*d*f^3*g^5*x + 3*a^2*c^2*f^2*g^
6*x + b^2*d^2*f^7*g - 2*b^2*c*d*f^6*g^2 - 2*a*b*d^2*f^6*g^2 + b^2*c^2*f^5*g
^3 + 4*a*b*c*d*f^5*g^3 + a^2*d^2*f^5*g^3 - 2*a*b*c^2*f^4*g^4 - 2*a^2*c*d*f^
4*g^4 + a^2*c^2*f^3*g^5) + 1/6*(2*B*b^4*c*d^3*f^3*n - 2*B*a*b^3*d^4*f^3*n -
3*B*b^4*c^2*d^2*f^2*g*n + 3*B*a^2*b^2*d^4*f^2*g*n + 3*B*b^4*c^3*d*f*g^2*n
- 3*B*a*b^3*c^2*d^2*f*g^2*n + 3*B*a^2*b^2*c*d^3*f*g^2*n - 3*B*a^3*b*d^4*f*g
^2*n - B*b^4*c^4*g^3*n + B*a*b^3*c^3*d*g^3*n - B*a^3*b*c*d^3*g^3*n + B*a^4*
d^4*g^3*n)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c +
a*d + abs(-b*c + a*d))))/((b^3*d^3*f^6*g - 3*b^3*c*d^2*f^5*g^2 - 3*a*b^2*d
^3*f^5*g^2 + 3*b^3*c^2*d*f^4*g^3 + 9*a*b^2*c*d^2*f^4*g^3 + 3*a^2*b*d^3*f^4*
g^3 - b^3*c^3*f^3*g^4 - 9*a*b^2*c^2*d*f^3*g^4 - 9*a^2*b*c*d^2*f^3*g^4 - a^3
*d^3*f^3*g^4 + 3*a*b^2*c^3*f^2*g^5 + 9*a^2*b*c^2*d*f^2*g^5 + 3*a^3*c*d^2*f^
2*g^5 - 3*a^2*b*c^3*f*g^6 - 3*a^3*c^2*d*f*g^6 + a^3*c^3*g^7)*abs(-b*c + a*d
))

3.66 $\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^5}\,dx$

Optimal. Leaf size=388

$$-\frac{Bn(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+2bdf)\left(-a\right.}{4(bf-ag}$$

```
[Out] -(B*(b*c - a*d)*n)/(12*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d
)*(2*b*d*f - b*c*g - a*d*g)*n)/(8*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2)
- (B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*
c*d*f*g + c^2*g^2))*n)/(4*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*n
*Log[a + b*x])/(4*g*(b*f - a*g)^4) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])
/(4*g*(f + g*x)^4) - (B*d^4*n*Log[c + d*x])/(4*g*(d*f - c*g)^4) - (B*(b*c -
 a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f
^2 - 2*c*d*f*g + c^2*g^2))*n*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rubi [A] time = 0.713149, antiderivative size = 388, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 72}

$$-\frac{Bn(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{Bn(bc-ad)\log(f+gx)(-adg-bcg+2bdf)\left(-a\right.}{4(bf-ag}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^5,x]
```


```
[Out] -(B*(b*c - a*d)*n)/(12*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d
)*(2*b*d*f - b*c*g - a*d*g)*n)/(8*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2)
- (B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*
c*d*f*g + c^2*g^2))*n)/(4*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*n
*Log[a + b*x])/(4*g*(b*f - a*g)^4) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])
/(4*g*(f + g*x)^4) - (B*d^4*n*Log[c + d*x])/(4*g*(d*f - c*g)^4) - (B*(b*c -
 a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f
^2 - 2*c*d*f*g + c^2*g^2))*n*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f - c*g)^4)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(f+gx)^5}\,dx = -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4g(f+gx)^4} + \frac{(Bn)\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \left(\frac{b^5}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5}{(bc-ad)(-df+cg)^4(c+dx)} + \dots\right.}{\dots}$$

$$= -\frac{B(bc-ad)n}{12(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n}{8(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{B(bc-ad)\left(a^2d^2g^2 \dots\right.}{\dots}$$

Mathematica [A] time = 1.35501, size = 359, normalized size = 0.93

$$\frac{Bn(bc-ad)\left(-\frac{g\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(f+gx)(bf-ag)^3(df-cg)^3} - \frac{g\log(f+gx)(adg+bcg-2bdf)\left(a^2d^2g^2-2abd^2fg+b^2\left(c^2g^2-2cdfg+2d^2f^2\right)\right)}{(bf-ag)^4(df-cg)^4} + \frac{b^4\log \dots}{(bc-ad \dots} \dots\right)}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^5,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])/(f + g*x)^4) + B*(b*c - a*d)*n*(-
g/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) + (g*(-2*b*d*f + b*c*g + a*d*g))/
(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 + a*b*d*g*(-3
*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)))/((b*f - a*g)^3*(d*f -
 c*g)^3*(f + g*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^4) - (d^4*
Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^4) - (g*(-2*b*d*f + b*c*g + a*d*g)*(
-2*a*b*d^2*f*g + a^2*d^2*g^2 + b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[f
 + g*x])/((b*f - a*g)^4*(d*f - c*g)^4)))/(4*g)
```

Maple [F] time = 0.502, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{5}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x)
```

Maxima [B] time = 1.96833, size = 2377, normalized size = 6.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
```

```
a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x))*B*n - 1/4*B*log(e*(b*x/(d*x
 + c) + a/(d*x + c))^n)/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*
x + f^4*g) - 1/4*A/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f
^4*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))/(g*x+f)**5,x)
```

```
[Out] Timed out
```

Giac [B] time = 14.5389, size = 5863, normalized size = 15.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] -1/4*B*n*log((b*x + a)/(d*x + c))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 +
4*f^3*g^2*x + f^4*g) + 1/4*(4*B*b^4*c*d^3*f^3*n - 4*B*a*b^3*d^4*f^3*n - 6*B
*b^4*c^2*d^2*f^2*g*n + 6*B*a^2*b^2*d^4*f^2*g*n + 4*B*b^4*c^3*d*f*g^2*n - 4*
B*a^3*b*d^4*f*g^2*n - B*b^4*c^4*g^3*n + B*a^4*d^4*g^3*n)*log(g*x + f)/(b^4*
d^4*f^8 - 4*b^4*c*d^3*f^7*g - 4*a*b^3*d^4*f^7*g + 6*b^4*c^2*d^2*f^6*g^2 + 1
6*a*b^3*c*d^3*f^6*g^2 + 6*a^2*b^2*d^4*f^6*g^2 - 4*b^4*c^3*d*f^5*g^3 - 24*a*
b^3*c^2*d^2*f^5*g^3 - 24*a^2*b^2*c*d^3*f^5*g^3 - 4*a^3*b*d^4*f^5*g^3 + b^4*
c^4*f^4*g^4 + 16*a*b^3*c^3*d*f^4*g^4 + 36*a^2*b^2*c^2*d^2*f^4*g^4 + 16*a^3*
b*c*d^3*f^4*g^4 + a^4*d^4*f^4*g^4 - 4*a*b^3*c^4*f^3*g^5 - 24*a^2*b^2*c^3*d*
f^3*g^5 - 24*a^3*b*c^2*d^2*f^3*g^5 - 4*a^4*c*d^3*f^3*g^5 + 6*a^2*b^2*c^4*f^
2*g^6 + 16*a^3*b*c^3*d*f^2*g^6 + 6*a^4*c^2*d^2*f^2*g^6 - 4*a^3*b*c^4*f*g^7
- 4*a^4*c^3*d*f*g^7 + a^4*c^4*g^8) - 1/8*(4*B*b^4*c*d^3*f^3*n - 4*B*a*b^3*d
^4*f^3*n - 6*B*b^4*c^2*d^2*f^2*g*n + 6*B*a^2*b^2*d^4*f^2*g*n + 4*B*b^4*c^3*
d*f*g^2*n - 4*B*a^3*b*d^4*f*g^2*n - B*b^4*c^4*g^3*n + B*a^4*d^4*g^3*n)*log(
abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^4*d^4*f^8 - 4*b^4*c*d^3*f^7*g - 4*a*
b^3*d^4*f^7*g + 6*b^4*c^2*d^2*f^6*g^2 + 16*a*b^3*c*d^3*f^6*g^2 + 6*a^2*b^2*
d^4*f^6*g^2 - 4*b^4*c^3*d*f^5*g^3 - 24*a*b^3*c^2*d^2*f^5*g^3 - 24*a^2*b^2*c
*d^3*f^5*g^3 - 4*a^3*b*d^4*f^5*g^3 + b^4*c^4*f^4*g^4 + 16*a*b^3*c^3*d*f^4*g
^4 + 36*a^2*b^2*c^2*d^2*f^4*g^4 + 16*a^3*b*c*d^3*f^4*g^4 + a^4*d^4*f^4*g^4
- 4*a*b^3*c^4*f^3*g^5 - 24*a^2*b^2*c^3*d*f^3*g^5 - 24*a^3*b*c^2*d^2*f^3*g^5
 - 4*a^4*c*d^3*f^3*g^5 + 6*a^2*b^2*c^4*f^2*g^6 + 16*a^3*b*c^3*d*f^2*g^6 + 6
*a^4*c^2*d^2*f^2*g^6 - 4*a^3*b*c^4*f*g^7 - 4*a^4*c^3*d*f*g^7 + a^4*c^4*g^8)
 - 1/24*(18*B*b^3*c*d^2*f^2*g^4*n*x^3 - 18*B*a*b^2*d^3*f^2*g^4*n*x^3 - 18*B
*b^3*c^2*d*f*g^5*n*x^3 + 18*B*a^2*b*d^3*f*g^5*n*x^3 + 6*B*b^3*c^3*g^6*n*x^3
 - 6*B*a^3*d^3*g^6*n*x^3 + 60*B*b^3*c*d^2*f^3*g^3*n*x^2 - 60*B*a*b^2*d^3*f^
3*g^3*n*x^2 - 63*B*b^3*c^2*d*f^2*g^4*n*x^2 + 63*B*a^2*b*d^3*f^2*g^4*n*x^2 +
 21*B*b^3*c^3*f*g^5*n*x^2 + 9*B*a*b^2*c^2*d*f*g^5*n*x^2 - 9*B*a^2*b*c*d^2*f
*g^5*n*x^2 - 21*B*a^3*d^3*f*g^5*n*x^2 - 3*B*a*b^2*c^3*g^6*n*x^2 + 3*B*a^3*c
```

*d^2*g^6*n*x^2 + 68*B*b^3*c*d^2*f^4*g^2*n*x - 68*B*a*b^2*d^3*f^4*g^2*n*x - 76*B*b^3*c^2*d*f^3*g^3*n*x + 76*B*a^2*b*d^3*f^3*g^3*n*x + 26*B*b^3*c^3*f^2*g^4*n*x + 24*B*a*b^2*c^2*d*f^2*g^4*n*x - 24*B*a^2*b*c*d^2*f^2*g^4*n*x - 26*B*a^3*d^3*f^2*g^4*n*x - 10*B*a*b^2*c^3*f*g^5*n*x + 10*B*a^3*c*d^2*f*g^5*n*x + 2*B*a^2*b*c^3*g^6*n*x - 2*B*a^3*c^2*d*g^6*n*x + 26*B*b^3*c*d^2*f^5*g*n - 26*B*a*b^2*d^3*f^5*g*n - 31*B*b^3*c^2*d*f^4*g^2*n + 31*B*a^2*b*d^3*f^4*g^2*n + 11*B*b^3*c^3*f^3*g^3*n + 15*B*a*b^2*c^2*d*f^3*g^3*n - 15*B*a^2*b*c*d^2*f^3*g^3*n - 11*B*a^3*d^3*f^3*g^3*n - 7*B*a*b^2*c^3*f^2*g^4*n + 7*B*a^3*c*d^2*f^2*g^4*n + 2*B*a^2*b*c^3*f*g^5*n - 2*B*a^3*c^2*d*f*g^5*n + 6*A*b^3*d^3*f^6 + 6*B*b^3*d^3*f^6 - 18*A*b^3*c*d^2*f^5*g - 18*B*b^3*c*d^2*f^5*g - 18*A*a*b^2*d^3*f^5*g - 18*B*a*b^2*d^3*f^5*g + 18*A*b^3*c^2*d*f^4*g^2 + 18*B*b^3*c^2*d*f^4*g^2 + 54*A*a*b^2*c*d^2*f^4*g^2 + 54*B*a*b^2*c*d^2*f^4*g^2 + 18*A*a^2*b*d^3*f^4*g^2 + 18*B*a^2*b*d^3*f^4*g^2 - 6*A*b^3*c^3*f^3*g^3 - 6*B*b^3*c^3*f^3*g^3 - 54*A*a*b^2*c^2*d*f^3*g^3 - 54*B*a*b^2*c^2*d*f^3*g^3 - 54*A*a^2*b*c*d^2*f^3*g^3 - 54*B*a^2*b*c*d^2*f^3*g^3 - 6*A*a^3*d^3*f^3*g^3 - 6*B*a^3*d^3*f^3*g^3 + 18*A*a*b^2*c^3*f^2*g^4 + 18*B*a*b^2*c^3*f^2*g^4 + 54*A*a^2*b*c^2*d*f^2*g^4 + 54*B*a^2*b*c^2*d*f^2*g^4 + 18*A*a^3*c*d^2*f^2*g^4 + 18*B*a^3*c*d^2*f^2*g^4 - 18*A*a^2*b*c^3*f*g^5 - 18*B*a^2*b*c^3*f*g^5 - 18*A*a^3*c^2*d*f*g^5 - 18*B*a^3*c^2*d*f*g^5 + 6*A*a^3*c^3*g^6 + 6*B*a^3*c^3*g^6)/(b^3*d^3*f^6*g^5*x^4 - 3*b^3*c*d^2*f^5*g^6*x^4 - 3*a*b^2*d^3*f^5*g^6*x^4 + 3*b^3*c^2*d*f^4*g^7*x^4 + 9*a*b^2*c*d^2*f^4*g^7*x^4 + 3*a^2*b*d^3*f^4*g^7*x^4 - b^3*c^3*f^3*g^8*x^4 - 9*a*b^2*c^2*d*f^3*g^8*x^4 - 9*a^2*b*c*d^2*f^3*g^8*x^4 - a^3*d^3*f^3*g^8*x^4 + 3*a*b^2*c^3*f^2*g^9*x^4 + 9*a^2*b*c^2*d*f^2*g^9*x^4 + 3*a^3*c*d^2*f^2*g^9*x^4 - 3*a^2*b*c^3*f*g^10*x^4 - 3*a^3*c^2*d*f*g^10*x^4 + a^3*c^3*g^11*x^4 + 4*b^3*d^3*f^7*g^4*x^3 - 12*b^3*c*d^2*f^6*g^5*x^3 - 12*a*b^2*d^3*f^6*g^5*x^3 + 12*b^3*c^2*d*f^5*g^6*x^3 + 36*a*b^2*c*d^2*f^5*g^6*x^3 + 12*a^2*b*d^3*f^5*g^6*x^3 - 4*b^3*c^3*f^4*g^7*x^3 - 36*a*b^2*c^2*d*f^4*g^7*x^3 - 36*a^2*b*c*d^2*f^4*g^7*x^3 - 4*a^3*d^3*f^4*g^7*x^3 + 12*a*b^2*c^3*f^3*g^8*x^3 + 36*a^2*b*c^2*d*f^3*g^8*x^3 + 12*a^3*c*d^2*f^3*g^8*x^3 - 12*a^2*b*c^3*f^2*g^9*x^3 - 12*a^3*c^2*d*f^2*g^9*x^3 + 4*a^3*c^3*f*g^10*x^3 + 6*b^3*d^3*f^8*g^3*x^2 - 18*b^3*c*d^2*f^7*g^4*x^2 - 18*a*b^2*d^3*f^7*g^4*x^2 + 18*b^3*c^2*d*f^6*g^5*x^2 + 54*a*b^2*c*d^2*f^6*g^5*x^2 + 18*a^2*b*d^3*f^6*g^5*x^2 - 6*b^3*c^3*f^5*g^6*x^2 - 54*a*b^2*c^2*d*f^5*g^6*x^2 - 54*a^2*b*c*d^2*f^5*g^6*x^2 - 6*a^3*d^3*f^5*g^6*x^2 + 18*a*b^2*c^3*f^4*g^7*x^2 + 54*a^2*b*c^2*d*f^4*g^7*x^2 + 18*a^3*c*d^2*f^4*g^7*x^2 - 18*a^2*b*c^3*f^3*g^8*x^2 - 18*a^3*c^2*d*f^3*g^8*x^2 + 6*a^3*c^3*f^2*g^9*x^2 + 4*b^3*d^3*f^9*g^2*x - 12*b^3*c*d^2*f^8*g^3*x - 12*a*b^2*d^3*f^8*g^3*x + 12*b^3*c^2*d*f^7*g^4*x + 36*a*b^2*c*d^2*f^7*g^4*x + 12*a^2*b*d^3*f^7*g^4*x - 4*b^3*c^3*f^6*g^5*x - 36*a*b^2*c^2*d*f^6*g^5*x - 36*a^2*b*c*d^2*f^6*g^5*x - 4*a^3*d^3*f^6*g^5*x + 12*a*b^2*c^3*f^5*g^6*x + 36*a^2*b*c^2*d*f^5*g^6*x + 12*a^3*c*d^2*f^5*g^6*x - 12*a^2*b*c^3*f^4*g^7*x - 12*a^3*c^2*d*f^4*g^7*x + 4*a^3*c^3*f^3*g^8*x + b^3*d^3*f^10*g - 3*b^3*c*d^2*f^9*g^2 - 3*a*b^2*d^3*f^9*g^2 + 3*b^3*c^2*d*f^8*g^3 + 9*a*b^2*c*d^2*f^8*g^3 + 3*a^2*b*d^3*f^8*g^3 - b^3*c^3*f^7*g^4 - 9*a*b^2*c^2*d*f^7*g^4 - 9*a^2*b*c*d^2*f^7*g^4 - a^3*d^3*f^7*g^4 + 3*a*b^2*c^3*f^6*g^5 + 9*a^2*b*c^2*d*f^6*g^5 + 3*a^3*c*d^2*f^6*g^5 - 3*a^2*b*c^3*f^5*g

```
^6 - 3*a^3*c^2*d*f^5*g^6 + a^3*c^3*f^4*g^7) + 1/8*(2*B*b^5*c*d^4*f^4*n - 2*
B*a*b^4*d^5*f^4*n - 4*B*b^5*c^2*d^3*f^3*g*n + 4*B*a^2*b^3*d^5*f^3*g*n + 6*B
*b^5*c^3*d^2*f^2*g^2*n - 6*B*a*b^4*c^2*d^3*f^2*g^2*n + 6*B*a^2*b^3*c*d^4*f^
2*g^2*n - 6*B*a^3*b^2*d^5*f^2*g^2*n - 4*B*b^5*c^4*d*f*g^3*n + 4*B*a*b^4*c^3
*d^2*f*g^3*n - 4*B*a^3*b^2*c*d^4*f*g^3*n + 4*B*a^4*b*d^5*f*g^3*n + B*b^5*c^
5*g^4*n - B*a*b^4*c^4*d*g^4*n + B*a^4*b*c*d^4*g^4*n - B*a^5*d^5*g^4*n)*log(
abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c
 + a*d))))/((b^4*d^4*f^8*g - 4*b^4*c*d^3*f^7*g^2 - 4*a*b^3*d^4*f^7*g^2 + 6*
b^4*c^2*d^2*f^6*g^3 + 16*a*b^3*c*d^3*f^6*g^3 + 6*a^2*b^2*d^4*f^6*g^3 - 4*b^
4*c^3*d*f^5*g^4 - 24*a*b^3*c^2*d^2*f^5*g^4 - 24*a^2*b^2*c*d^3*f^5*g^4 - 4*a
^3*b*d^4*f^5*g^4 + b^4*c^4*f^4*g^5 + 16*a*b^3*c^3*d*f^4*g^5 + 36*a^2*b^2*c^
2*d^2*f^4*g^5 + 16*a^3*b*c*d^3*f^4*g^5 + a^4*d^4*f^4*g^5 - 4*a*b^3*c^4*f^3*
g^6 - 24*a^2*b^2*c^3*d*f^3*g^6 - 24*a^3*b*c^2*d^2*f^3*g^6 - 4*a^4*c*d^3*f^3
*g^6 + 6*a^2*b^2*c^4*f^2*g^7 + 16*a^3*b*c^3*d*f^2*g^7 + 6*a^4*c^2*d^2*f^2*g
^7 - 4*a^3*b*c^4*f*g^8 - 4*a^4*c^3*d*f*g^8 + a^4*c^4*g^9)*abs(-b*c + a*d))
```

3.67 $\int (f+gx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=923

$$\frac{B^2g^3n^2\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3n^2\log(c+dx)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3n^2x(bc-ad)^3}{6b^3d^3}+\frac{B^2g^2(4bdf-3bcg-adg)n^2\log\left(\frac{a}{c}\right.}{4b^4d^4}$$

```
[Out] (B^2*(b*c - a*d)^3*g^3*n^2*x)/(6*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f
 - 3*b*c*g - a*d*g)*n^2*x)/(4*b^3*d^3) + (B^2*(b*c - a*d)^2*g^3*n^2*(c + d*
x)^2)/(12*b^2*d^4) - (B*(b*c - a*d)*g*(a^2*d^2*g^2 - 2*a*b*d*g*(2*d*f - c*g
) + b^2*(6*d^2*f^2 - 8*c*d*f*g + 3*c^2*g^2))*n*(a + b*x)*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n]))/(2*b^4*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - 3*b*c*g -
 a*d*g)*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^2*d^4) -
 (B*(b*c - a*d)*g^3*n*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(
6*b*d^4) - ((b*f - a*g)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*b^4*
g) + ((f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*g) - (B*(b*c
 - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2
*f^2 - 2*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(
b*c - a*d)/(b*(c + d*x))])/(2*b^4*d^4) + (B^2*(b*c - a*d)^4*g^3*n^2*Log[(a
+ b*x)/(c + d*x)])/(6*b^4*d^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - 3*b*c*g
- a*d*g)*n^2*Log[(a + b*x)/(c + d*x)])/(4*b^4*d^4) + (B^2*(b*c - a*d)^4*g^3
*n^2*Log[c + d*x])/(6*b^4*d^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - 3*b*c*g
- a*d*g)*n^2*Log[c + d*x])/(4*b^4*d^4) + (B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2
- 2*a*b*d*g*(2*d*f - c*g) + b^2*(6*d^2*f^2 - 8*c*d*f*g + 3*c^2*g^2))*n^2*Lo
g[c + d*x])/(2*b^4*d^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b
*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n^2*PolyLog
[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b^4*d^4)
```

Rubi [A] time = 1.83533, antiderivative size = 1060, normalized size of antiderivative = 1.15, number of steps used = 31, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2n^2\log^2(a+bx)(bf-ag)^4}{4b^4g}-\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)(bf-ag)^4}{2b^4g}-\frac{B^2n^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)(bf-}{2b^4g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 -
 4*c*d*f*g + c^2*g^2))*n*x)/(2*b^3*d^3) - (B^2*(b*c - a*d)^2*(b*c + a*d)*g^
3*n^2*x)/(6*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - b*c*g - a*d*g)*n^2
*x)/(4*b^3*d^3) + (B^2*(b*c - a*d)^2*g^3*n^2*x^2)/(12*b^2*d^2) - (a^3*B^2*(
b*c - a*d)*g^3*n^2*Log[a + b*x])/(6*b^4*d) + (a^2*B^2*(b*c - a*d)*g^2*(4*b*
d*f - b*c*g - a*d*g)*n^2*Log[a + b*x])/(4*b^4*d^2) + (B^2*(b*f - a*g)^4*n^2
*Log[a + b*x]^2)/(4*b^4*g) - (B^2*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d
*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n*(a + b*x)*Log[e*((a +
b*x)/(c + d*x))^n])/(2*b^4*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d
*g)*n*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*b^2*d^2) - (B*(b*c - a
*d)*g^3*n*x^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*b*d) - (B*(b*f - a
*g)^4*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*b^4*g) + ((
f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*g) + (B^2*c^3*(b*c
- a*d)*g^3*n^2*Log[c + d*x])/(6*b*d^4) - (B^2*c^2*(b*c - a*d)*g^2*(4*b*d*f
- b*c*g - a*d*g)*n^2*Log[c + d*x])/(4*b^2*d^4) + (B^2*(b*c - a*d)^2*g*(a^2*
d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n^
2*Log[c + d*x])/(2*b^4*d^4) - (B^2*(d*f - c*g)^4*n^2*Log[-((d*(a + b*x))/(b
*c - a*d))]*Log[c + d*x])/(2*d^4*g) + (B*(d*f - c*g)^4*n*(A + B*Log[e*((a +
 b*x)/(c + d*x))^n])*Log[c + d*x])/(2*d^4*g) + (B^2*(d*f - c*g)^4*n^2*Log[c
 + d*x]^2)/(4*d^4*g) - (B^2*(b*f - a*g)^4*n^2*Log[a + b*x]*Log[(b*(c + d*x)
)/(b*c - a*d)])/(2*b^4*g) - (B^2*(b*f - a*g)^4*n^2*PolyLog[2, -((d*(a + b*x
))/(b*c - a*d))])/(2*b^4*g) - (B^2*(d*f - c*g)^4*n^2*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(2*d^4*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)^3 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{(Bn)\int \frac{(bc-ad)(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{(a+bx)(c+dx)}}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{(B(bc-ad)n)\int \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{(a+bx)(c+dx)}}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{(B(bc-ad)n)\int\left(\frac{g^2\left(a^2d^2g^2-abdg(4df-cg\right.}{}\right.}{}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g} - \frac{\left(B(bc-ad)g^3n\right)\int x^2\left(A+B\log\left(e\right.\right.}{2bd}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)n}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)n}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)n}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)n}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)n}{2b^3d^3}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)n}{2b^3d^3}$$

Mathematica [A] time = 1.04064, size = 757, normalized size = 0.82

$$(f+gx)^4\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn\left(3b^4Bn(df-cg)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-3Bd^4n(bf-ag)^4\left(\log(a+bx\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*n*(6*A*b*d*(b*c
- a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f
*g + c^2*g^2))*x + 6*B*d*(b*c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c
*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[e*((a + b*x)/(c
+ d*x))^n] + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B
*Log[e*((a + b*x)/(c + d*x))^n]) + 2*b^3*d^3*(b*c - a*d)*g^4*x^3*(A + B*Log
[e*((a + b*x)/(c + d*x))^n]) + 6*d^4*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[
e*((a + b*x)/(c + d*x))^n]) - 6*B*(b*c - a*d)^2*g^2*(a^2*d^2*g^2 + a*b*d*g*
(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n*Log[c + d*x] - 6*
b^4*(d*f - c*g)^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + B*(
b*c - a*d)*g^4*n*(b*d*(b*c - a*d)*x*(2*b*c + 2*a*d - b*d*x) + 2*a^3*d^3*Log
[a + b*x] - 2*b^3*c^3*Log[c + d*x]) - 3*B*(b*c - a*d)*g^3*(-4*b*d*f + b*c*g
 + a*d*g)*n*(-(a^2*d^2*Log[a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c
+ d*x])) - 3*B*d^4*(b*f - a*g)^4*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(
c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 3*b
^4*B*(d*f - c*g)^4*n*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*
Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*b^4*d^4))/(4*g
)
```

Maple [F] time = 0.428, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((g*x+f)^3*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.99702, size = 3579, normalized size = 3.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")

[Out] 1/2*A*B*g^3*x^4*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/4*A^2*g^3*x^4 +
2*A*B*f*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*f*g^2*x^3 + 3*
A*B*f^2*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 3/2*A^2*f^2*g*x^2 -
1/12*A*B*g^3*n*(6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c
*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^
3)*x)/(b^3*d^3)) + A*B*f*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)
/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 3*A
*B*f^2*g*n*(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*
d)) + 2*A*B*f^3*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*f^3*x*log(e
*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*f^3*x - 1/12*(6*a^3*c*d^3*g^3*n^2 -
 3*(8*c*d^3*f*g^2*n^2 - c^2*d^2*g^3*n^2)*a^2*b + 2*(18*c*d^3*f^2*g*n^2 - 6*
c^2*d^2*f*g^2*n^2 + c^3*d*g^3*n^2)*a*b^2 + (24*c*d^3*f^3*n*log(e) - (11*g^3
*n^2 + 6*g^3*n*log(e))*c^4 + 12*(3*f*g^2*n^2 + 2*f*g^2*n*log(e))*c^3*d - 36
*(f^2*g*n^2 + f^2*g*n*log(e))*c^2*d^2)*b^3)*B^2*log(d*x + c)/(b^3*d^4) + 1/
2*(4*a*b^3*d^4*f^3*n^2 - 6*a^2*b^2*d^4*f^2*g*n^2 + 4*a^3*b*d^4*f*g^2*n^2 -
a^4*d^4*g^3*n^2 - (4*c*d^3*f^3*n^2 - 6*c^2*d^2*f^2*g*n^2 + 4*c^3*d*f*g^2*n^
2 - c^4*g^3*n^2)*b^4)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + di
log(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^
4*log(e)^2 + 6*(4*c*d^3*f^3*n^2 - 6*c^2*d^2*f^2*g*n^2 + 4*c^3*d*f*g^2*n^2 -
 c^4*g^3*n^2)*B^2*b^4*log(b*x + a)*log(d*x + c) - 3*(4*c*d^3*f^3*n^2 - 6*c^
2*d^2*f^2*g*n^2 + 4*c^3*d*f*g^2*n^2 - c^4*g^3*n^2)*B^2*b^4*log(d*x + c)^2 +
 2*(a*b^3*d^4*g^3*n*log(e) - (c*d^3*g^3*n*log(e) - 6*d^4*f*g^2*log(e)^2)*b^
4)*B^2*x^3 + ((g^3*n^2 - 3*g^3*n*log(e))*a^2*b^2*d^4 - 2*(c*d^3*g^3*n^2 - 6
*d^4*f*g^2*n*log(e))*a*b^3 - (12*c*d^3*f*g^2*n*log(e) - 18*d^4*f^2*g*log(e)
^2 - (g^3*n^2 + 3*g^3*n*log(e))*c^2*d^2)*b^4)*B^2*x^2 - 3*(4*a*b^3*d^4*f^3*
n^2 - 6*a^2*b^2*d^4*f^2*g*n^2 + 4*a^3*b*d^4*f*g^2*n^2 - a^4*d^4*g^3*n^2)*B^
2*log(b*x + a)^2 - ((5*g^3*n^2 - 6*g^3*n*log(e))*a^3*b*d^4 - (5*c*d^3*g^3*n
^2 + 12*(f*g^2*n^2 - 2*f*g^2*n*log(e))*d^4)*a^2*b^2 + (24*c*d^3*f*g^2*n^2 -
 5*c^2*d^2*g^3*n^2 - 36*d^4*f^2*g*n*log(e))*a*b^3 + (36*c*d^3*f^2*g*n*log(e
) - 12*d^4*f^3*log(e)^2 + (5*g^3*n^2 + 6*g^3*n*log(e))*c^3*d - 12*(f*g^2*n^
2 + 2*f*g^2*n*log(e))*c^2*d^2)*b^4)*B^2*x + ((11*g^3*n^2 - 6*g^3*n*log(e))*
a^4*d^4 - 2*(c*d^3*g^3*n^2 + 6*(3*f*g^2*n^2 - 2*f*g^2*n*log(e))*d^4)*a^3*b
+ 3*(4*c*d^3*f*g^2*n^2 - c^2*d^2*g^3*n^2 + 12*(f^2*g*n^2 - f^2*g*n*log(e))*
d^4)*a^2*b^2 - 6*(6*c*d^3*f^2*g*n^2 - 4*c^2*d^2*f*g^2*n^2 + c^3*d*g^3*n^2 -
 4*d^4*f^3*n*log(e))*a*b^3)*B^2*log(b*x + a) + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B
^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x)*log((
b*x + a)^n)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^
4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x)*log((d*x + c)^n)^2 + (6*B^2*b^4*d^4*
g^3*x^4*log(e) - 6*(4*c*d^3*f^3*n - 6*c^2*d^2*f^2*g*n + 4*c^3*d*f*g^2*n - c
^4*g^3*n)*B^2*b^4*log(d*x + c) + 2*(a*b^3*d^4*g^3*n - (c*d^3*g^3*n - 12*d^4
*f*g^2*log(e))*b^4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2*n - a^2*b^2*d^4*g^3*n -
```

```
(4*c*d^3*f*g^2*n - c^2*d^2*g^3*n - 12*d^4*f^2*g*log(e))*b^4)*B^2*x^2 + 6*(6
*a*b^3*d^4*f^2*g*n - 4*a^2*b^2*d^4*f*g^2*n + a^3*b*d^4*g^3*n - (6*c*d^3*f^2
*g*n - 4*c^2*d^2*f*g^2*n + c^3*d*g^3*n - 4*d^4*f^3*log(e))*b^4)*B^2*x + 6*(
4*a*b^3*d^4*f^3*n - 6*a^2*b^2*d^4*f^2*g*n + 4*a^3*b*d^4*f*g^2*n - a^4*d^4*g
^3*n)*B^2*log(b*x + a))*log((b*x + a)^n) - (6*B^2*b^4*d^4*g^3*x^4*log(e) -
6*(4*c*d^3*f^3*n - 6*c^2*d^2*f^2*g*n + 4*c^3*d*f*g^2*n - c^4*g^3*n)*B^2*b^4
*log(d*x + c) + 2*(a*b^3*d^4*g^3*n - (c*d^3*g^3*n - 12*d^4*f*g^2*log(e))*b^
4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2*n - a^2*b^2*d^4*g^3*n - (4*c*d^3*f*g^2*n
- c^2*d^2*g^3*n - 12*d^4*f^2*g*log(e))*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g*
n - 4*a^2*b^2*d^4*f*g^2*n + a^3*b*d^4*g^3*n - (6*c*d^3*f^2*g*n - 4*c^2*d^2*
f*g^2*n + c^3*d*g^3*n - 4*d^4*f^3*log(e))*b^4)*B^2*x + 6*(4*a*b^3*d^4*f^3*n
 - 6*a^2*b^2*d^4*f^2*g*n + 4*a^3*b*d^4*f*g^2*n - a^4*d^4*g^3*n)*B^2*log(b*x
 + a) + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^
2*g*x^2 + 4*B^2*b^4*d^4*f^3*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^4*d^4
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*g^3
*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log(e*((b*x + a)/(d*x + c
))^n)^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*log(e
*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)^3 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.68 $\int (f+gx)^2 \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=565

$$\frac{2B^2n^2(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^3d^3}+\frac{2Bn(bc-ad)\left(a^2d^2g^2-a\right.}{}$$

```
[Out] (B^2*(b*c - a*d)^2*g^2*n^2*x)/(3*b^2*d^2) - (2*B*(b*c - a*d)*g*(3*b*d*f - 2
*b*c*g - a*d*g)*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*b^3*
d^2) - (B*(b*c - a*d)*g^2*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(3*b*d^3) - ((b*f - a*g)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(
3*b^3*g) + ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(3*g) + (
2*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c
*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)
/(b*(c + d*x))])/(3*b^3*d^3) + (B^2*(b*c - a*d)^3*g^2*n^2*Log[(a + b*x)/(c
+ d*x)])/(3*b^3*d^3) + (B^2*(b*c - a*d)^3*g^2*n^2*Log[c + d*x])/(3*b^3*d^3)
 + (2*B^2*(b*c - a*d)^2*g*(3*b*d*f - 2*b*c*g - a*d*g)*n^2*Log[c + d*x])/(3*
b^3*d^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3
*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(3*b^3*d^3)
```

Rubi [A] time = 1.15004, antiderivative size = 699, normalized size of antiderivative = 1.24, number of steps used = 27, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2n^2(bf-ag)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3g}-\frac{2B^2n^2(df-cg)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3d^3g}+\frac{a^2B^2g^2n^2(bc-ad)\log(a+bx)}{3b^3d}-\frac{2AB}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*x)/(3*b^2*d^2) + (B^2*(b*
c - a*d)^2*g^2*n^2*x)/(3*b^2*d^2) + (a^2*B^2*(b*c - a*d)*g^2*n^2*Log[a + b*
x])/(3*b^3*d) + (B^2*(b*f - a*g)^3*n^2*Log[a + b*x]^2)/(3*b^3*g) - (2*B^2*(
b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*n*(a + b*x)*Log[e*((a + b*x)/(c + d*
x))^n])/(3*b^3*d^2) - (B*(b*c - a*d)*g^2*n*x^2*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n]))/(3*b*d) - (2*B*(b*f - a*g)^3*n*Log[a + b*x]*(A + B*Log[e*((a +
```

```
b*x)/(c + d*x))^n]))/(3*b^3*g) + ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c +
d*x))^n])^2)/(3*g) - (B^2*c^2*(b*c - a*d)*g^2*n^2*Log[c + d*x])/(3*b*d^3) +
 (2*B^2*(b*c - a*d)^2*g*(3*b*d*f - b*c*g - a*d*g)*n^2*Log[c + d*x])/(3*b^3*
d^3) - (2*B^2*(d*f - c*g)^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d
*x])/(3*d^3*g) + (2*B*(d*f - c*g)^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
)*Log[c + d*x])/(3*d^3*g) + (B^2*(d*f - c*g)^3*n^2*Log[c + d*x]^2)/(3*d^3*g
) - (2*B^2*(b*f - a*g)^3*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
3*b^3*g) - (2*B^2*(b*f - a*g)^3*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))
])/(3*b^3*g) - (2*B^2*(d*f - c*g)^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/(3*d^3*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{(2Bn)\int \frac{(bc-ad)(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{(2B(bc-ad)n)\int \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{(2B(bc-ad)n)\int\left(\frac{g^2(3bdf-bcg-adg)\left(A+B\right.}{b^2d^2}\right.}{}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g} - \frac{\left(2B(bc-ad)g^2n\right)\int x\left(A+B\log\left(e\left(\right.\right.\right.}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{B(bc-ad)g^2nx^2\left(A+B\log\left(e\left(\frac{a+}{c+}\right.\right.\right.}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-bcg-adg)n}{3b^3d^2}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-bcg-adg)n}{3b^3d^2}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2d^2} + \frac{a^2B^2(bc-a}{}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2d^2} + \frac{a^2B^2(bc-a}{}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)nx}{3b^2d^2} + \frac{B^2(bc-ad)^2g^2n^2x}{3b^2d^2} + \frac{a^2B^2(bc-a}{}$$

Mathematica [A] time = 0.565092, size = 506, normalized size = 0.9

$$\frac{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn\left(b^3Bn(df-cg)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-Bd^3n(bf-ag)^3\left(\log(a+bx)\left(\log\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*n*(2*A*b*d*(b*c
- a*d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + 2*B*d*(b*c - a*d)*g^2*(3*b*d*f - b
*c*g - a*d*g)*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n] + b^2*d^2*(b*c - a*d
)*g^3*x^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d^3*(b*f - a*g)^3*Log[
a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*B*(b*c - a*d)^2*g^2*(-3
*b*d*f + b*c*g + a*d*g)*n*Log[c + d*x] - 2*b^3*(d*f - c*g)^3*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n])*Log[c + d*x] - B*(b*c - a*d)*g^3*n*(a^2*d^2*Log[a
+ b*x] - b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - B*d^3*(b*f - a*g)^3
*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*Poly
Log[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b^3*B*(d*f - c*g)^3*n*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/(b^3*d^3))/(3*g)
```

Maple [F] time = 0.421, size = 0, normalized size = 0.

$$\int (gx+f)^2 \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((g*x+f)^2*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.78847, size = 2240, normalized size = 3.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] 2/3*A*B*g^2*x^3*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/3*A^2*g^2*x^3 +
2*A*B*f*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + A^2*f*g*x^2 + 1/3*A*
```

```
B*g^2*n*(2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*
d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2)) - 2*A*B*f*g*n*(a^2*log(b*x +
 a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B*f^2*n*(a*log(
b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*f^2*x*log(e*(b*x/(d*x + c) + a/(d*x
+ c))^n) + A^2*f^2*x + 1/3*(2*a^2*c*d^2*g^2*n^2 - (6*c*d^2*f*g*n^2 - c^2*d*
g^2*n^2)*a*b - (6*c*d^2*f^2*n*log(e) + (3*g^2*n^2 + 2*g^2*n*log(e))*c^3 - 6
*(f*g*n^2 + f*g*n*log(e))*c^2*d)*b^2)*B^2*log(d*x + c)/(b^2*d^3) + 2/3*(3*a
*b^2*d^3*f^2*n^2 - 3*a^2*b*d^3*f*g*n^2 + a^3*d^3*g^2*n^2 - (3*c*d^2*f^2*n^2
 - 3*c^2*d*f*g*n^2 + c^3*g^2*n^2)*b^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
 - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/3*(B^2*
b^3*d^3*g^2*x^3*log(e)^2 + 2*(3*c*d^2*f^2*n^2 - 3*c^2*d*f*g*n^2 + c^3*g^2*n
^2)*B^2*b^3*log(b*x + a)*log(d*x + c) - (3*c*d^2*f^2*n^2 - 3*c^2*d*f*g*n^2
+ c^3*g^2*n^2)*B^2*b^3*log(d*x + c)^2 + (a*b^2*d^3*g^2*n*log(e) - (c*d^2*g^
2*n*log(e) - 3*d^3*f*g*log(e)^2)*b^3)*B^2*x^2 - (3*a*b^2*d^3*f^2*n^2 - 3*a^
2*b*d^3*f*g*n^2 + a^3*d^3*g^2*n^2)*B^2*log(b*x + a)^2 + ((g^2*n^2 - 2*g^2*n
*log(e))*a^2*b*d^3 - 2*(c*d^2*g^2*n^2 - 3*d^3*f*g*n*log(e))*a*b^2 - (6*c*d^
2*f*g*n*log(e) - 3*d^3*f^2*log(e)^2 - (g^2*n^2 + 2*g^2*n*log(e))*c^2*d)*b^3
)*B^2*x - ((3*g^2*n^2 - 2*g^2*n*log(e))*a^3*d^3 - (c*d^2*g^2*n^2 + 6*(f*g*n
^2 - f*g*n*log(e))*d^3)*a^2*b + 2*(3*c*d^2*f*g*n^2 - c^2*d*g^2*n^2 - 3*d^3*
f^2*n*log(e))*a*b^2)*B^2*log(b*x + a) + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^
3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*g^2*x^3
+ 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x)*log((d*x + c)^n)^2 + (2*B^2*
b^3*d^3*g^2*x^3*log(e) - 2*(3*c*d^2*f^2*n - 3*c^2*d*f*g*n + c^3*g^2*n)*B^2*
b^3*log(d*x + c) + (a*b^2*d^3*g^2*n - (c*d^2*g^2*n - 6*d^3*f*g*log(e))*b^3)
*B^2*x^2 + 2*(3*a*b^2*d^3*f*g*n - a^2*b*d^3*g^2*n - (3*c*d^2*f*g*n - c^2*d*
g^2*n - 3*d^3*f^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d^3*f^2*n - 3*a^2*b*d^3*f
*g*n + a^3*d^3*g^2*n)*B^2*log(b*x + a))*log((b*x + a)^n) - (2*B^2*b^3*d^3*g
^2*x^3*log(e) - 2*(3*c*d^2*f^2*n - 3*c^2*d*f*g*n + c^3*g^2*n)*B^2*b^3*log(d
*x + c) + (a*b^2*d^3*g^2*n - (c*d^2*g^2*n - 6*d^3*f*g*log(e))*b^3)*B^2*x^2
+ 2*(3*a*b^2*d^3*f*g*n - a^2*b*d^3*g^2*n - (3*c*d^2*f*g*n - c^2*d*g^2*n - 3
*d^3*f^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d^3*f^2*n - 3*a^2*b*d^3*f*g*n + a^
3*d^3*g^2*n)*B^2*log(b*x + a) + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*
x^2 + 3*B^2*b^3*d^3*f^2*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2g^2x^2 + 2\,A^2fgx + A^2f^2 + \left(B^2g^2x^2 + 2\,B^2fgx + B^2f^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABg^2x^2 + 2\,ABfgx + ABf^2\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
```

```
")
```

```
[Out] integral(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*x +
 B^2*f^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x +
 A*B*f^2)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)^2 \left(B \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.69 $\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\,dx$

Optimal. Leaf size=290

$$\frac{B^2n^2(bc-ad)(-adg-bcg+2bdf)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2d^2}+\frac{Bn(bc-ad)(-adg-bcg+2bdf)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right.\right.}{b^2d^2}$$

```
[Out] -((B*(b*c - a*d)*g*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(b^2
*d)) - ((b*f - a*g)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*b^2*g) +
 ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*g) + (B*(b*c - a
*d)*(2*b*d*f - b*c*g - a*d*g)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[
(b*c - a*d)/(b*(c + d*x))])/(b^2*d^2) + (B^2*(b*c - a*d)^2*g*n^2*Log[c + d*
x])/(b^2*d^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*PolyLog[2, (
d*(a + b*x))/(b*(c + d*x))])/(b^2*d^2)
```

Rubi [A] time = 0.831266, antiderivative size = 481, normalized size of antiderivative = 1.66, number of steps used = 23, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2n^2(bf-ag)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}-\frac{B^2n^2(df-cg)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2g}-\frac{Bn(bf-ag)^2\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*n*x)/(b*d)) + (B^2*(b*f - a*g)^2*n^2*Log[a + b*x]^2)/(
2*b^2*g) - (B^2*(b*c - a*d)*g*n*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^n])/(
b^2*d) - (B*(b*f - a*g)^2*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(b^2*g) + ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/(2*g
) + (B^2*(b*c - a*d)^2*g*n^2*Log[c + d*x])/(b^2*d^2) - (B^2*(d*f - c*g)^2*n
^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*g) + (B*(d*f - c*g)
^2*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(d^2*g) + (B^2*(d
*f - c*g)^2*n^2*Log[c + d*x]^2)/(2*d^2*g) - (B^2*(b*f - a*g)^2*n^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b^2*g) - (B^2*(b*f - a*g)^2*n^2*PolyL
og[2, -((d*(a + b*x))/(b*c - a*d))])/(b^2*g) - (B^2*(d*f - c*g)^2*n^2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(Bn)\int \frac{(bc-ad)(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(B(bc-ad)n)\int \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\right.\right.}{(a+bx)(c+dx)}}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(B(bc-ad)n)\int\left(\frac{g^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{bd}\right.}{}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g} - \frac{(B(bc-ad)gn)\int\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{bd}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B(bf-ag)^2 n\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b^2 g} + \cdots$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2 d} - \frac{B(bf-ag)^2 n}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2 d} - \frac{B(bf-ag)^2 n}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} - \frac{B^2(bc-ad)gn(a+bx)\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{b^2 d} - \frac{B(bf-ag)^2 n}{}$$

$$= -\frac{AB(bc-ad)gnx}{bd} + \frac{B^2(bf-ag)^2 n^2\log^2(a+bx)}{2b^2 g} - \frac{B^2(bc-ad)gn(a+bx)}{b^2 d}$$

$$= -\frac{AB(bc-ad)gnx}{bd} + \frac{B^2(bf-ag)^2 n^2\log^2(a+bx)}{2b^2 g} - \frac{B^2(bc-ad)gn(a+bx)}{b^2 d}$$

Mathematica [A] time = 0.32811, size = 362, normalized size = 1.25

$$\frac{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2 - \frac{Bn\left(b^2Bn(df-cg)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-Bd^2n(bf-ag)^2\left(\log(a+bx)\left(\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] ((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 - (B*n*(2*A*b*d*(b*c
- a*d)*g^2*x + 2*B*d*(b*c - a*d)*g^2*(a + b*x)*Log[e*((a + b*x)/(c + d*x))^
n] + 2*d^2*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]
) - 2*B*(b*c - a*d)^2*g^2*n*Log[c + d*x] - 2*b^2*(d*f - c*g)^2*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - B*d^2*(b*f - a*g)^2*n*(Log[a + b*
x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)]) + b^2*B*(d*f - c*g)^2*n*((2*Log[(d*(a + b*x))/(-(b*
c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c -
 a*d)])))/(b^2*d^2))/(2*g)
```

Maple [F] time = 0.274, size = 0, normalized size = 0.

$$\int \left(gx+f\right)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [B] time = 3.50015, size = 1214, normalized size = 4.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] A*B*g*x^2*log(e*(b*x/(d*x + c) + a/(d*x + c))^n) + 1/2*A^2*g*x^2 - A*B*g*n*
(a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d)) + 2*A*B
*f*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*f*x*log(e*(b*x/(d*x + c)
 + a/(d*x + c))^n) + A^2*f*x - (a*c*d*g*n^2 + (2*c*d*f*n*log(e) - (g*n^2 +
g*n*log(e))*c^2)*b)*B^2*log(d*x + c)/(b*d^2) + (2*a*b*d^2*f*n^2 - a^2*d^2*g
*n^2 - (2*c*d*f*n^2 - c^2*g*n^2)*b^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c
```

```
- a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/2*(B^2*b
^2*d^2*g*x^2*log(e)^2 + 2*(2*c*d*f*n^2 - c^2*g*n^2)*B^2*b^2*log(b*x + a)*lo
g(d*x + c) - (2*c*d*f*n^2 - c^2*g*n^2)*B^2*b^2*log(d*x + c)^2 - (2*a*b*d^2*
f*n^2 - a^2*d^2*g*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*g*n*log(e) - (c*d*g*
n*log(e) - d^2*f*log(e)^2)*b^2)*B^2*x + 2*((g*n^2 - g*n*log(e))*a^2*d^2 - (
c*d*g*n^2 - 2*d^2*f*n*log(e))*a*b)*B^2*log(b*x + a) + (B^2*b^2*d^2*g*x^2 +
2*B^2*b^2*d^2*f*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*
f*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*g*x^2*log(e) - (2*c*d*f*n - c^2*g*
n)*B^2*b^2*log(d*x + c) + (a*b*d^2*g*n - (c*d*g*n - 2*d^2*f*log(e))*b^2)*B^
2*x + (2*a*b*d^2*f*n - a^2*d^2*g*n)*B^2*log(b*x + a))*log((b*x + a)^n) - 2*
(B^2*b^2*d^2*g*x^2*log(e) - (2*c*d*f*n - c^2*g*n)*B^2*b^2*log(d*x + c) + (a
*b*d^2*g*n - (c*d*g*n - 2*d^2*f*log(e))*b^2)*B^2*x + (2*a*b*d^2*f*n - a^2*d
^2*g*n)*B^2*log(b*x + a) + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x)*log((b*x
 + a)^n))*log((d*x + c)^n))/(b^2*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABgx + ABf\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log(e*((b*x + a)/(d*x + c))^n)
^2 + 2*(A*B*g*x + A*B*f)*log(e*((b*x + a)/(d*x + c))^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.70 $\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx$

Optimal. Leaf size=135

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{2Bn(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right.}{b}$$

```
[Out] ((a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/b + (2*B*(b*c - a*d)*n
*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[(b*c - a*d)/(b*(c + d*x))])/(b*
d) + (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d)
```

Rubi [B] time = 0.617333, antiderivative size = 275, normalized size of antiderivative = 2.04, number of steps used = 20, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {2523, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2aB^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b}+\frac{2B^2cn^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d}+\frac{2aBn\log(a+bx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{b}-\frac{2Bcn\log(c}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] -((a*B^2*n^2*Log[a + b*x]^2)/b) + (2*a*B*n*Log[a + b*x]*(A + B*Log[e*((a +
b*x)/(c + d*x))^n]))/b + x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (2*B^
2*c*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (2*B*c*n*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/d - (B^2*c*n^2*Log[c + d*x]^
2)/d + (2*a*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (2*a*B
^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/b + (2*B^2*c*n^2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/d
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 dx = x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - (2Bn)\int \frac{(bc-ad)x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - (2B(bc-ad)n)\int \frac{x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - (2B(bc-ad)n)\int \left(-\frac{a\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(a+bx)} + \frac{c(\ldots}{\ldots}\right.$$

$$= x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + (2aBn)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx - (2Bcn)\int \frac{A+\ldots}{\ldots}$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - \frac{2Bcn(\ldots}{\ldots}$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - \frac{2Bcn(\ldots}{\ldots}$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 - \frac{2Bcn(\ldots}{\ldots}$$

$$= \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{2B^2cn^2\ldots}{\ldots}$$

$$= -\frac{aB^2n^2\log^2(a+bx)}{b} + \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\,\ldots\right.\right.$$

$$= -\frac{aB^2n^2\log^2(a+bx)}{b} + \frac{2aBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{b} + x\left(A+B\log\left(e\,\ldots\right.\right.$$

Mathematica [A] time = 0.170024, size = 226, normalized size = 1.67

$$\frac{Bn\left(-aBdn\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBcn\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+\ldots\right.\right.}{b\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] x*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(2*a*d*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b*c*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*Log[c + d*x] - a*B*d*n*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*c*n*(
(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyL
og[2, (b*(c + d*x))/(b*c - a*d)])))/(b*d)
```

Maple [F] time = 0.309, size = 0, normalized size = 0.

$$\int \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,ABn\left(\frac{a\log\left(bx+a\right)}{b} - \frac{c\log\left(dx+c\right)}{d}\right) + 2\,ABx\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A^{2}x + B^{2}\left(\frac{2\,bcn^{2}\log\left(bx+a\right)\log\left(dx+c\right) - bcn^{2}\,\mathrm{lo}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] 2*A*B*n*(a*log(b*x + a)/b - c*log(d*x + c)/d) + 2*A*B*x*log(e*((b*x + a)/(d
*x + c))^n) + A^2*x + B^2*((2*b*c*n^2*log(b*x + a)*log(d*x + c) - b*c*n^2*l
og(d*x + c)^2 + b*d*x*log((b*x + a)^n)^2 + b*d*x*log((d*x + c)^n)^2 + 2*(a*
d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x*log(e))*log((b*x + a)^n) - 2*
(a*d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x*log((b*x + a)^n) + b*d*x*l
og(e))*log((d*x + c)^n))/(b*d) - integrate(-(b^2*d*x^2*log(e)^2 + a*b*c*log
(e)^2 - ((2*n*log(e) - log(e)^2)*b^2*c - (2*n*log(e) + log(e)^2)*a*b*d)*x -
 2*(b^2*c*n^2*x + 2*a*b*c*n^2 - a^2*d*n^2)*log(b*x + a))/(b^2*d*x^2 + a*b*c
```

```
 + (b^2*c + a*b*d)*x), x))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*x
 + c))^n) + A^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.71 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{f+gx}\,dx$

Optimal. Leaf size=297

$$\frac{2Bn\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}-\frac{2Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{g}-\frac{2B^2n^2\text{Pol}}{}$$

```
[Out] -(((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[(b*c - a*d)/(b*(c + d*x))])
/g) + ((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[1 - ((d*f - c*g)*(a + b
*x))/((b*f - a*g)*(c + d*x))])/g - (2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x)
)^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/g + (2*B*n*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c +
d*x))])/g + (2*B^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/g - (2*B^2*
n^2*PolyLog[3, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/g
```

Rubi [B] time = 5.18411, antiderivative size = 2233, normalized size of antiderivative = 7.52, number of steps used = 43, number of rules used = 21, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.656, Rules used = {2524, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 12, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2437, 2435, 2315}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x),x]
```

```
[Out] (-2*A*B*n*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g - (B^2*Log[(a +
 b*x)^n]^2*Log[f + g*x])/g + ((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2*Log[
f + g*x])/g + (2*B^2*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]*Log
[f + g*x])/g + (2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[f
 + g*x])/g + (2*A*B*n*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g - (
2*B^2*n*(n*Log[a + b*x] - Log[(a + b*x)^n])*Log[-((g*(c + d*x))/(d*f - c*g)
)]*Log[f + g*x])/g - (B^2*Log[(c + d*x)^(-n)]^2*Log[f + g*x])/g + (2*B^2*n*
Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c +
 d*x))^n] + Log[(c + d*x)^(-n)])*Log[f + g*x])/g - (2*B^2*n*Log[-((g*(c + d
*x))/(d*f - c*g))]*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log
[(c + d*x)^(-n)])*Log[f + g*x])/g - (2*B^2*n*Log[-((g*(a + b*x))/(b*f - a*g
))]*(n*Log[c + d*x] + Log[(c + d*x)^(-n)])*Log[f + g*x])/g + (B^2*Log[(a +
```

b*x)^n]^2*Log[(b*(f + g*x))/(b*f - a*g)])/g + (B^2*Log[(c + d*x)^(-n)]^2*Lo
g[(d*(f + g*x))/(d*f - c*g)])/g + (B^2*n^2*(Log[(b*(c + d*x))/(b*c - a*d)]
+ Log[(b*f - a*g)/(b*(f + g*x))] - Log[((b*f - a*g)*(c + d*x))/((b*c - a*d)
*(f + g*x))])*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]^2)/g
- (B^2*n^2*(Log[(b*(c + d*x))/(b*c - a*d)] - Log[-((g*(c + d*x))/(d*f - c*g
))])*(Log[a + b*x] + Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))
])^2)/g + (B^2*n^2*(Log[-((d*(a + b*x))/(b*c - a*d))] + Log[(d*f - c*g)/(d*
(f + g*x))] - Log[-(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])*Log[
((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]^2)/g - (B^2*n^2*(Log[-((d*
(a + b*x))/(b*c - a*d))] - Log[-((g*(a + b*x))/(b*f - a*g))])*(Log[c + d*x]
 + Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])^2)/g + (2*B^2*n^2*
(Log[f + g*x] - Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/g + (2*B^2*n*Log[(a + b*x)^n]*PolyL
og[2, -((g*(a + b*x))/(b*f - a*g))])/g + (2*B^2*n^2*(Log[f + g*x] - Log[((b
*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)])/g - (2*B^2*n*Log[(c + d*x)^(-n)]*PolyLog[2, -((g*(c + d*x))/(d*f
 - c*g))])/g - (2*B^2*n^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b
*x)))]*PolyLog[2, (g*(a + b*x))/(b*(f + g*x))])/g + (2*B^2*n^2*Log[-(((b*c
- a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]*PolyLog[2, -(((d*f - c*g)*(a +
b*x))/((b*c - a*d)*(f + g*x)))])/g - (2*B^2*n^2*Log[((b*c - a*d)*(f + g*x))
/((b*f - a*g)*(c + d*x))]*PolyLog[2, (g*(c + d*x))/(d*(f + g*x))])/g + (2*B
^2*n^2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]*PolyLog[2, ((b*
f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])/g - (2*A*B*n*PolyLog[2, (b*(f
 + g*x))/(b*f - a*g)])/g + (2*B^2*n*(Log[(a + b*x)^n] - Log[e*((a + b*x)/(c
 + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g
 - (2*B^2*n*(n*Log[c + d*x] + Log[(c + d*x)^(-n)])*PolyLog[2, (b*(f + g*x))
/(b*f - a*g)])/g + (2*B^2*n^2*(Log[c + d*x] + Log[((b*c - a*d)*(f + g*x))/(
(b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2*A*B*
n*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (2*B^2*n*(n*Log[a + b*x] - Log
[(a + b*x)^n])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (2*B^2*n*(Log[(a
+ b*x)^n] - Log[e*((a + b*x)/(c + d*x))^n] + Log[(c + d*x)^(-n)])*PolyLog[2
, (d*(f + g*x))/(d*f - c*g)])/g + (2*B^2*n^2*(Log[a + b*x] + Log[-(((b*c -
a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, (d*(f + g*x))/(d*f -
c*g)])/g - (2*B^2*n^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/g - (2*B^2*
n^2*PolyLog[3, -((g*(a + b*x))/(b*f - a*g))])/g - (2*B^2*n^2*PolyLog[3, (b*
(c + d*x))/(b*c - a*d)])/g - (2*B^2*n^2*PolyLog[3, -((g*(c + d*x))/(d*f - c
*g))])/g - (2*B^2*n^2*PolyLog[3, (g*(a + b*x))/(b*(f + g*x))])/g + (2*B^2*n
^2*PolyLog[3, -(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (2*B
^2*n^2*PolyLog[3, (g*(c + d*x))/(d*(f + g*x))])/g + (2*B^2*n^2*PolyLog[3, (
(b*f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])/g - (2*B^2*n^2*PolyLog[3,
(b*(f + g*x))/(b*f - a*g)])/g - (2*B^2*n^2*PolyLog[3, (d*(f + g*x))/(d*f -
c*g)])/g

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
```

```
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2437

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*Log[(h_.)*((i_.) + (j_.)*(x_))^(m
_.)])/(x_), x_Symbol] :> Dist[m, Int[(Log[i + j*x]*Log[c*(d + e*x)^n])/x, x
], x] - Dist[m*Log[i + j*x] - Log[h*(i + j*x)^m], Int[Log[c*(d + e*x)^n]/x,
 x], x] /; FreeQ[{c, d, e, h, i, j, m, n}, x] && NeQ[e*i - d*j, 0] && NeQ[i
 + j*x, h*(i + j*x)^m]
```

Rule 2435

```
Int[(Log[(a_) + (b_.)*(x_)]*Log[(c_) + (d_.)*(x_)])/(x_), x_Symbol] :> Simp
[Log[-((b*x)/a)]*Log[a + b*x]*Log[c + d*x], x] + (Simp[(1*(Log[-((b*x)/a)]
- Log[-(((b*c - a*d)*x)/(a*(c + d*x)))] + Log[(b*c - a*d)/(b*(c + d*x))])*L
og[(a*(c + d*x))/(c*(a + b*x))]^2)/2, x] - Simp[(1*(Log[-((b*x)/a)] - Log[-
```

```
((d*x)/c)])*(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])^2)/2, x] + Si
mp[(Log[c + d*x] - Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1 + (b*x)/a
], x] + Simp[(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1
 + (d*x)/c], x] + Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2, (c*(a +
b*x))/(a*(c + d*x))], x] - Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))], x] - Simp[PolyLog[3, 1 + (b*x)/a], x] - Simp
[PolyLog[3, 1 + (d*x)/c], x] + Simp[PolyLog[3, (c*(a + b*x))/(a*(c + d*x))]
, x] - Simp[PolyLog[3, (d*(a + b*x))/(b*(c + d*x))], x]) /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{f+gx}\,dx = \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2Bn)\int \frac{(c+dx)\left(-\frac{d(a+bx)}{(c+dx)^2}+\frac{b}{c+dx}\right)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\mathrm{lo}}{a+bx}}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad)n)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad)n)\int \left(\frac{b\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{(bc-ad)(a+bx)}\right.}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2bBn)\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(f+gx)}{a+bx}\,dx}{g} + \frac{(2B}{}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2bBn)\int \left(\frac{A\log(f+gx)}{a+bx}+\frac{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\log(f+gx)}{a+bx}\right.}{g}$$

$$= \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} - \frac{(2AbBn)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} - \frac{\left(2bB^2n\right)\int \frac{\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.}{}}{g}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} + \frac{2ABn\,\mathrm{l}}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2\log(f+gx)}{g} + \frac{2ABn\,\mathrm{l}}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\right.\right.}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\right.\right.}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(e\right.\right.}{}$$

$$= -\frac{2ABn\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{} - \frac{B^2\log^2\left((a+bx)^n\right)\log(f+gx)}{} + \frac{\left(A+B\log\left(e\right.\right.}{}$$

Mathematica [B] time = 0.473154, size = 1441, normalized size = 4.85

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x),x]
```

```
[Out] (-(B^2*n^2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[((b*f - a*g)*(c + d*x))/((
d*f - c*g)*(a + b*x))]^2) + A^2*Log[f + g*x] - 2*A*B*n*Log[a/b + x]*Log[f +
 g*x] + B^2*n^2*Log[a/b + x]^2*Log[f + g*x] + 2*A*B*n*Log[c/d + x]*Log[f +
g*x] - 2*B^2*n^2*Log[a/b + x]*Log[c/d + x]*Log[f + g*x] + B^2*n^2*Log[c/d +
 x]^2*Log[f + g*x] + 2*A*B*Log[e*((a + b*x)/(c + d*x))^n]*Log[f + g*x] - 2*
B^2*n*Log[a/b + x]*Log[e*((a + b*x)/(c + d*x))^n]*Log[f + g*x] + 2*B^2*n*Lo
g[c/d + x]*Log[e*((a + b*x)/(c + d*x))^n]*Log[f + g*x] + B^2*Log[e*((a + b*
x)/(c + d*x))^n]^2*Log[f + g*x] + 2*A*B*n*Log[a/b + x]*Log[(b*(f + g*x))/(b
*f - a*g)] - B^2*n^2*Log[a/b + x]^2*Log[(b*(f + g*x))/(b*f - a*g)] + 2*B^2*
n*Log[a/b + x]*Log[e*((a + b*x)/(c + d*x))^n]*Log[(b*(f + g*x))/(b*f - a*g)
] + 2*B^2*n^2*Log[a/b + x]*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[(b*(f + g*
x))/(b*f - a*g)] - B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]^2*Log[(b*(f +
g*x))/(b*f - a*g)] + 2*B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((b*f
- a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*Log[(b*(f + g*x))/(b*f - a*g)] -
 B^2*n^2*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]^2*Log[(b*(f +
 g*x))/(b*f - a*g)] - 2*A*B*n*Log[c/d + x]*Log[(d*(f + g*x))/(d*f - c*g)] +
 2*B^2*n^2*Log[a/b + x]*Log[c/d + x]*Log[(d*(f + g*x))/(d*f - c*g)] - B^2*n
^2*Log[c/d + x]^2*Log[(d*(f + g*x))/(d*f - c*g)] - 2*B^2*n*Log[c/d + x]*Log
[e*((a + b*x)/(c + d*x))^n]*Log[(d*(f + g*x))/(d*f - c*g)] - 2*B^2*n^2*Log[
a/b + x]*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[(d*(f + g*x))/(d*f - c*g)] +
 B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]^2*Log[(d*(f + g*x))/(d*f - c*g)]
 - 2*B^2*n^2*Log[(g*(c + d*x))/(-(d*f) + c*g)]*Log[((b*f - a*g)*(c + d*x))/
((d*f - c*g)*(a + b*x))]*Log[(d*(f + g*x))/(d*f - c*g)] + B^2*n^2*Log[((b*f
 - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]^2*Log[((-(b*c) + a*d)*(f + g*x)
)/((d*f - c*g)*(a + b*x))] + 2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] +
B*n*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(a
+ b*x))/(-(b*f) + a*g)] - 2*B*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n] + B*n
*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])*PolyLog[2, (g*(c + d
*x))/(-(d*f) + c*g)] - 2*B^2*n^2*Log[((b*f - a*g)*(c + d*x))/((d*f - c*g)*(
a + b*x))]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*n^2*Log[((b*f -
a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))]*PolyLog[2, ((b*f - a*g)*(c + d*x))
/((d*f - c*g)*(a + b*x))] + 2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x)
)] - 2*B^2*n^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((d*f - c*g)*(a + b*x))])
/g
```

Maple [F] time = 0.528, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{A^2\log\left(gx+f\right)}{g}+\int\frac{B^2\log\left((bx+a)^n\right)^2+B^2\log\left((dx+c)^n\right)^2+B^2\log\left(e\right)^2+2\,AB\log\left(e\right)+2\left(B^2\log\left(e\right)+AB\right)\log\left((b\right.}{gx+f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x, algorithm="maxima")
```

```
[Out] A^2*log(g*x + f)/g + integrate((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^
n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log(e) + A*B)*log((b*x + a)^n)
- 2*(B^2*log((b*x + a)^n) + B^2*log(e) + A*B)*log((d*x + c)^n))/(g*x + f),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2}+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A^2}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(g*x + f), x)
```

3.72 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^2}\,dx$

Optimal. Leaf size=206

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{(bf-ag)(df-cg)}+\frac{2Bn(bc-ad)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)}{(bf-ag)(df-cg)}+\frac{(a+bx)\left(B\log\ldots\right.}{(f+\ldots}$$

```
[Out] ((a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2)/((b*f - a*g)*(f + g*x)
) + (2*B*(b*c - a*d)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[1 - ((d*f
 - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b*f - a*g)*(d*f - c*g)) + (2
*B^2*(b*c - a*d)*n^2*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d
*x))])/((b*f - a*g)*(d*f - c*g))
```

Rubi [B] time = 1.13374, antiderivative size = 657, normalized size of antiderivative = 3.19, number of steps used = 29, number of rules used = 10, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.312, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2bB^2n^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g(bf-ag)}+\frac{2B^2dn^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g(df-cg)}-\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{(bf-ag)(df-cg)}+\frac{2B^2n^2(bc-ad)\ldots}{(bf-a\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^2,x]
```

```
[Out] -((b*B^2*n^2*Log[a + b*x]^2)/(g*(b*f - a*g))) + (2*b*B*n*Log[a + b*x]*(A +
B*Log[e*((a + b*x)/(c + d*x))^n]))/(g*(b*f - a*g)) - (A + B*Log[e*((a + b*x
)/(c + d*x))^n])^2/(g*(f + g*x)) + (2*B^2*d*n^2*Log[-((d*(a + b*x))/(b*c -
a*d))]*Log[c + d*x])/(g*(d*f - c*g)) - (2*B*d*n*(A + B*Log[e*((a + b*x)/(c
+ d*x))^n])*Log[c + d*x])/(g*(d*f - c*g)) - (B^2*d*n^2*Log[c + d*x]^2)/(g*(
d*f - c*g)) + (2*b*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*
(b*f - a*g)) - (2*B^2*(b*c - a*d)*n^2*Log[-((g*(a + b*x))/(b*f - a*g))]*Log
[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (2*B*(b*c - a*d)*n*(A + B*Log[e*((a
+ b*x)/(c + d*x))^n])*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(b*c
 - a*d)*n^2*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)*(d
*f - c*g)) + (2*b*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f
 - a*g)) + (2*B^2*d*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*
g)) - (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f -
```

```
a*g)*(d*f - c*g)) + (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (d*(f + g*x))/(d*f -
c*g)])/((b*f - a*g)*(d*f - c*g))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^2}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)}dx}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)}dx}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad)n)\int \left(\frac{b^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n \cdots\right.\right.}{(bc-ad)(-df+cg)(c+d\cdots}\right.}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{\left(2b^2Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}dx}{g(bf-ag)} - \frac{\left(2Bd^2n\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)\cdots\right.}{c+dx}}{g(df-cg)}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} - \frac{2Bdn\left(A+B\,\mathrm{l}\cdots\right.}{\cdots}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} - \frac{2Bdn\left(A+B\,\mathrm{l}\cdots\right.}{\cdots}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} - \frac{2Bdn\left(A+B\,\mathrm{l}\cdots\right.}{\cdots}$$

$$= \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{g(f+gx)} + \frac{2B^2dn^2\log\left(-\cdots\right.}{g(\cdots}$$

$$= -\frac{bB^2n^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{g(f+gx)}$$

$$= -\frac{bB^2n^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bBn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(e\left(\frac{a+b\cdots}{c+d\cdots}\right.\right.\right.}{g(f+gx)}$$

Mathematica [B] time = 0.7378, size = 418, normalized size = 2.03

$$\frac{Bn\left(-bBn(df-cg)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bdn(bf-ag)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2B\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)) + (B*n*(2*b*(d*f - c
*g)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*d*(b*f - a*g)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] + 2*(b*c - a*d)*g*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x] - b*B*(d*f - c*g)*n*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) + B*d*(b*f - a*g)*n*((2*Log[(d*(a + b*x))/(-(b*c)
 + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)]) - 2*B*(b*c - a*d)*g*n*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c
 + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*
g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)*(d*f - c*g)))/g
```

Maple [F] time = 0.516, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}} \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,ABn\left(\frac{b\log\left(bx+a\right)}{bfg-ag^{2}} - \frac{d\log\left(dx+c\right)}{dfg-cg^{2}} + \frac{(bc-ad)\log\left(gx+f\right)}{bdf^{2}+acg^{2}-(bc+ad)fg}\right) - B^{2}\left(\frac{\log\left(\left(dx+c\right)^{n}\right)^{2}}{g^{2}x+fg} + \int -\frac{dgx\log\left(e\right)^{2}+cg\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x, algorithm="maxima
")
```

```
[Out] 2*A*B*n*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) +
(b*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g)) - B^2*(log(
(d*x + c)^n)^2/(g^2*x + f*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 +
(d*g*x + c*g)*log((b*x + a)^n)^2 + 2*(d*g*x*log(e) + c*g*log(e))*log((b*x +
 a)^n) + 2*(d*f*n + (g*n - g*log(e))*d*x - c*g*log(e) - (d*g*x + c*g)*log((
b*x + a)^n))*log((d*x + c)^n))/(d*g^3*x^3 + c*f^2*g + (2*d*f*g^2 + c*g^3)*x
^2 + (d*f^2*g + 2*c*f*g^2)*x), x)) - 2*A*B*log(e*(b*x/(d*x + c) + a/(d*x +
c))^n)/(g^2*x + f*g) - A^2/(g^2*x + f*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{B^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2}{g^2x^2 + 2\,fgx + f^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^2*x^2 + 2*f*g*x + f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(gx+f)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(g*x + f)^2, x)
```

3.73 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^3}\,dx$

Optimal. Leaf size=389

$$\frac{B^2n^2(bc-ad)(-adg-bcg+2bdf)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{(bf-ag)^2(df-cg)^2}+\frac{b^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2}{2g(bf-ag)^2}+\frac{Bgn(a+bx)(bc-ad)\left(B\log\right.}{(f+gx)(bf-ag)}$$

```
[Out] (B*(b*c - a*d)*g*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*f
- a*g)^2*(d*f - c*g)*(f + g*x)) + (b^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n
])^2)/(2*g*(b*f - a*g)^2) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*g*(
f + g*x)^2) + (B^2*(b*c - a*d)^2*g*n^2*Log[(f + g*x)/(c + d*x)])/((b*f - a*
g)^2*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n*(A + B*Log
[e*((a + b*x)/(c + d*x))^n])*Log[1 - ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(
c + d*x))])/((b*f - a*g)^2*(d*f - c*g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c
*g - a*d*g)*n^2*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))]
)/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rubi [B] time = 1.56109, antiderivative size = 941, normalized size of antiderivative = 2.42, number of steps used = 33, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2n^2\log^2(a+bx)b^2}{2g(bf-ag)^2}+\frac{Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^2}{g(bf-ag)^2}+\frac{B^2n^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^2}{g(bf-ag)^2}+\frac{B^2n^2\text{PolyLog}\left(\right.}{g(bf-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^3,x]
```

```
[Out] (b*B^2*(b*c - a*d)*n^2*Log[a + b*x])/((b*f - a*g)^2*(d*f - c*g)) - (b^2*B^2
*n^2*Log[a + b*x]^2)/(2*g*(b*f - a*g)^2) - (B*(b*c - a*d)*n*(A + B*Log[e*((
a + b*x)/(c + d*x))^n]))/((b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*n*Log
[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(g*(b*f - a*g)^2) - (A +
B*Log[e*((a + b*x)/(c + d*x))^n])^2/(2*g*(f + g*x)^2) - (B^2*d*(b*c - a*d)*
n^2*Log[c + d*x])/((b*f - a*g)*(d*f - c*g)^2) + (B^2*d^2*n^2*Log[-((d*(a +
b*x))/(b*c - a*d))]*Log[c + d*x])/(g*(d*f - c*g)^2) - (B*d^2*n*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(g*(d*f - c*g)^2) - (B^2*d^2*n^2*L
og[c + d*x]^2)/(2*g*(d*f - c*g)^2) + (b^2*B^2*n^2*Log[a + b*x]*Log[(b*(c +
```

```
d*x))/(b*c - a*d)])/(g*(b*f - a*g)^2) + (B^2*(b*c - a*d)^2*g*n^2*Log[f + g*
x])/((b*f - a*g)^2*(d*f - c*g)^2) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d
*g)*n^2*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)^2*(d*f
 - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n*(A + B*Log[e*((a +
b*x)/(c + d*x))^n])*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (B^2*(b*c
 - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[-((g*(c + d*x))/(d*f - c*g))]*Log
[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (b^2*B^2*n^2*PolyLog[2, -((d*(a
+ b*x))/(b*c - a*d))])/(g*(b*f - a*g)^2) + (B^2*d^2*n^2*PolyLog[2, (b*(c +
d*x))/(b*c - a*d)])/(g*(d*f - c*g)^2) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*n^2*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)^2*(d*f - c*
g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*PolyLog[2, (d*(f + g
*x))/(d*f - c*g)])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^3}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g(f+gx)^2}+\frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g(f+gx)^2}+\frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g(f+gx)^2}+\frac{(B(bc-ad)n)\int \left(\frac{b^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(-df+cg)^2(c+\cdots}\right.}{}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{2g(f+gx)^2}+\frac{\left(b^3Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{g(bf-ag)^2}-\frac{\left(Bd^3n\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{c+dx}}{g(df-cg)^2}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)^2}-$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)^2}-$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{g(bf-ag)^2}-$$

$$= \frac{bB^2(bc-ad)n^2\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2Bn\log(a+bx\cdots}{g\cdots}$$

$$= \frac{bB^2(bc-ad)n^2\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{b^2B^2n^2\log^2(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{(bf-ag)(df-cg)(f+gx)}$$

$$= \frac{bB^2(bc-ad)n^2\log(a+bx)}{(bf-ag)^2(df-cg)}-\frac{b^2B^2n^2\log^2(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\cdots\right.\right.\right.}{(bf-ag)(df-cg)(f+gx)}$$

Mathematica [A] time = 2.23813, size = 615, normalized size = 1.58

$$-\frac{Bn(f+gx)\left(b^2Bn(f+gx)(df-cg)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-Bd^2n(f+gx)(bf-ag)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^3,x]
```

```
[Out] -((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(f + g*x)*(2*(b*c - a*d)*
g*(b*f - a*g)*(d*f - c*g)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b^2*(d
*f - c*g)^2*(f + g*x)*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) +
 2*d^2*(b*f - a*g)^2*(f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c
 + d*x] + 2*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*Log[e
*((a + b*x)/(c + d*x))^n])*Log[f + g*x] - 2*B*(b*c - a*d)*g*n*(f + g*x)*(b*
(d*f - c*g)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*
Log[f + g*x]) + b^2*B*(d*f - c*g)^2*n*(f + g*x)*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) - B*d^2*(b*f - a*g)^2*n*(f + g*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
) - 2*B*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*n*(f + g*x)*((Log[(g*(a +
b*x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + P
olyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)
])))/((b*f - a*g)^2*(d*f - c*g)^2))/(2*g*(f + g*x)^2)
```

Maple [F] time = 0.512, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(\frac{b^{2}\log\left(bx+a\right)}{b^{2}f^{2}g-2\,abfg^{2}+a^{2}g^{3}}-\frac{d^{2}\log\left(dx+c\right)}{d^{2}f^{2}g-2\,cdfg^{2}+c^{2}g^{3}}+\frac{\left(2\left(b^{2}cd-abd^{2}\right)f-\left(b^{2}c^{2}-a^{2}d^{2}\right)g\right)\log\left(gx+\right.}{b^{2}d^{2}f^{4}+a^{2}c^{2}g^{4}-2\left(b^{2}cd+abd^{2}\right)f^{3}g+\left(b^{2}c^{2}+4\,abcd+a^{2}d^{2}\right)f^{2}g}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x, algorithm="maxima
")
```

```
[Out] (b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c)/(d
^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2 - a
^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d^2)*
f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)*f*g
^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g + a
*c*g^3 - (b*c + a*d)*f*g^2)*x))*A*B*n - 1/2*B^2*(log((d*x + c)^n)^2/(g^3*x^
2 + 2*f*g^2*x + f^2*g) + 2*integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + (d*g
*x + c*g)*log((b*x + a)^n)^2 + 2*(d*g*x*log(e) + c*g*log(e))*log((b*x + a)^
n) + (d*f*n + (g*n - 2*g*log(e))*d*x - 2*c*g*log(e) - 2*(d*g*x + c*g)*log((
b*x + a)^n))*log((d*x + c)^n))/(d*g^4*x^4 + c*f^3*g + (3*d*f*g^3 + c*g^4)*x
^3 + 3*(d*f^2*g^2 + c*f*g^3)*x^2 + (d*f^3*g + 3*c*f^2*g^2)*x), x)) - A*B*lo
g(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(g^3*x^2 + 2*f*g^2*x + f^2*g) - 1/2*A^
2/(g^3*x^2 + 2*f*g^2*x + f^2*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2}{g^3x^3+3\,fg^2x^2+3\,f^2gx+f^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^3*x^3 + 3*f*g^2*x^2 + 3*f^2*g*x + f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**3,x)
```

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(gx+f\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(g*x + f)^3, x)
```

3.74 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^4}\,dx$

Optimal. Leaf size=747

$$\frac{2B^2n^2(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{3(bf-ag)^3(df-cg)^3}+\frac{2Bn(bc-ad)\left(a^2d^2\right.}{}$$

```
[Out] (B^2*(b*c - a*d)^2*g^2*n^2*(c + d*x))/(3*(b*f - a*g)^2*(d*f - c*g)^3*(f + g
*x)) - (B*(b*c - a*d)*g^2*n*(c + d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^
n]))/(3*(b*f - a*g)*(d*f - c*g)^3*(f + g*x)^2) + (2*B*(b*c - a*d)*g*(3*b*d*
f - b*c*g - 2*a*d*g)*n*(a + b*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3
*(b*f - a*g)^3*(d*f - c*g)^2*(f + g*x)) + (b^3*(A + B*Log[e*((a + b*x)/(c +
 d*x))^n])^2)/(3*g*(b*f - a*g)^3) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^
2/(3*g*(f + g*x)^3) + (B^2*(b*c - a*d)^3*g^2*n^2*Log[(a + b*x)/(c + d*x)])/
(3*(b*f - a*g)^3*(d*f - c*g)^3) - (B^2*(b*c - a*d)^3*g^2*n^2*Log[(f + g*x)/
(c + d*x)])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)^2*g*(3*b*d
*f - b*c*g - 2*a*d*g)*n^2*Log[(f + g*x)/(c + d*x)])/(3*(b*f - a*g)^3*(d*f -
 c*g)^3) + (2*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d
^2*f^2 - 3*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log
[1 - ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/(3*(b*f - a*g)^3*(d*
f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2
*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*PolyLog[2, ((d*f - c*g)*(a + b*x))/
((b*f - a*g)*(c + d*x))])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rubi [A] time = 2.5001, antiderivative size = 1427, normalized size of antiderivative = 1.91, number of steps used = 37, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2n^2\log^2(a+bx)b^3}{3g(bf-ag)^3}+\frac{2Bn\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^3}{3g(bf-ag)^3}+\frac{2B^2n^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^3}{3g(bf-ag)^3}+\frac{2B^2n^2\text{PolyL}}{3g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^4,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g*n^2)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^2
*B^2*(b*c - a*d)*n^2*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)) + (2*b*B^2
```

```
*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[a + b*x])/(3*(b*f - a*g)^3*(
d*f - c*g)^2) - (b^3*B^2*n^2*Log[a + b*x]^2)/(3*g*(b*f - a*g)^3) - (B*(b*c
- a*d)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*f - a*g)*(d*f - c*g)
*(f + g*x)^2) - (2*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n*(A + B*Log[e*(
(a + b*x)/(c + d*x))^n]))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*b^
3*B*n*Log[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*g*(b*f - a*g)
^3) - (A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(3*g*(f + g*x)^3) - (B^2*d^2
*(b*c - a*d)*n^2*Log[c + d*x])/(3*(b*f - a*g)*(d*f - c*g)^3) - (2*B^2*d*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[c + d*x])/(3*(b*f - a*g)^2*(d*f
- c*g)^3) + (2*B^2*d^3*n^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/
(3*g*(d*f - c*g)^3) - (2*B*d^3*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log
[c + d*x])/(3*g*(d*f - c*g)^3) - (B^2*d^3*n^2*Log[c + d*x]^2)/(3*g*(d*f - c
*g)^3) + (2*b^3*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*g*(
b*f - a*g)^3) + (B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[f +
g*x])/((b*f - a*g)^3*(d*f - c*g)^3) - (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b
*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[-((g*(a
 + b*x))/(b*f - a*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x])/(3*(
b*f - a*g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*
d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[-((g*(c + d*x))
/(d*f - c*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*b^3*B^2*n
^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*g*(b*f - a*g)^3) + (2*B^2*d
^3*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*g*(d*f - c*g)^3) - (2*B^2*
(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f
*g + c^2*g^2))*n^2*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/(3*(b*f - a*g)^3*
(d*f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*PolyLog[2, (d*(f + g*x))/(d*f -
c*g)])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^4}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{(2Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{(2B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{(2B(bc-ad)n)\int \left(\frac{b^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)^3(a+bx)} + \frac{d^4\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right.\right.\right.}{(bc-ad)(-df+cg)^3(c\ldots}\right.}{\ldots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{3g(f+gx)^3} + \frac{\left(2b^4Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{3g(bf-ag)^3} - \frac{\left(2Bd^4n\right)\int \frac{A+B\log\left(e\left(\frac{a+b\ldots}{c+d\ldots}\right.\right.}{c+dx}}{3g(df-cg)^3}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)n\left(A+B\log\ldots\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)n\left(A+B\log\ldots\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)n\left(A+B\log\ldots\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)n^2\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bd\ldots}{3(bf-\ldots}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)n^2\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bd\ldots}{3(bf-\ldots}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)n^2\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bd\ldots}{3(bf-\ldots}$$

Mathematica [A] time = 4.48669, size = 918, normalized size = 1.23

$$-\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2 + \frac{Bn(f+gx)\left(2d^3(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)\log(c+dx)(bf-ag)^3-Bd^3n(f+gx)^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+dx)+\ldots\right.\right.}{\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^4,x]
```

```
[Out] -((A + B*Log[e*((a + b*x)/(c + d*x))^n])^2 + (B*n*(f + g*x)*((b*c - a*d)*g*
(b*f - a*g)^2*(d*f - c*g)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*(b*c
 - a*d)*g*(b*f - a*g)*(-(d*f) + c*g)*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(
A + B*Log[e*((a + b*x)/(c + d*x))^n]) - 2*b^3*(d*f - c*g)^3*(f + g*x)^2*Log
[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]) + 2*d^3*(b*f - a*g)^3*(f +
 g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x] - 2*(b*c - a*d)
*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2
*g^2))*(f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[f + g*x] - 2*
B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*n*(f + g*x)^2*(b*(d*f - c*g)*Log[
a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]) +
B*(b*c - a*d)*g*n*(f + g*x)*((b*c - a*d)*g*(b*f - a*g)*(d*f - c*g) - b^2*(d
*f - c*g)^2*(f + g*x)*Log[a + b*x] + d^2*(b*f - a*g)^2*(f + g*x)*Log[c + d*
x] + (b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*Log[f + g*x]) + b^3
*B*(d*f - c*g)^3*n*(f + g*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - B*d^3*(
b*f - a*g)^3*n*(f + g*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c +
d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*B*(b*c -
a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g +
 c^2*g^2))*n*(f + g*x)^2*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c +
d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)]
 - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)^3*(d*f - c*g)^3))/
(3*g*(f + g*x)^3)
```

Maple [F] time = 0.511, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{4}} \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x, algorithm="maxima
")
```

```
[Out] 1/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x))*A*B*n - 1/3*B^2*(log((d*x + c)^n
)^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) + 3*integrate(-1/3*(3*d*g
*x*log(e)^2 + 3*c*g*log(e)^2 + 3*(d*g*x + c*g)*log((b*x + a)^n)^2 + 6*(d*g*
x*log(e) + c*g*log(e))*log((b*x + a)^n) + 2*(d*f*n + (g*n - 3*g*log(e))*d*x
 - 3*c*g*log(e) - 3*(d*g*x + c*g)*log((b*x + a)^n))*log((d*x + c)^n))/(d*g^
5*x^5 + c*f^4*g + (4*d*f*g^4 + c*g^5)*x^4 + 2*(3*d*f^2*g^3 + 2*c*f*g^4)*x^3
 + 2*(2*d*f^3*g^2 + 3*c*f^2*g^3)*x^2 + (d*f^4*g + 4*c*f^3*g^2)*x), x)) - 2/
3*A*B*log(e*(b*x/(d*x + c) + a/(d*x + c))^n)/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2
*g^2*x + f^3*g) - 1/3*A^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2}{g^4x^4+4\,fg^3x^3+6\,f^2g^2x^2+4\,f^3gx+f^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^4*x^4 + 4*f*g^3*x^3 + 6*f^2*g^2*x^2 + 4*f^3*g*x + f^4)
, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}{\left(gx+f\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(g*x + f)^4, x)
```

3.75 $\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^5}\,dx$

Optimal. Leaf size=1208

result too large to display

```
[Out] -(B^2*(b*c - a*d)^2*g^3*n^2*(c + d*x)^2)/(12*(b*f - a*g)^2*(d*f - c*g)^4*(f
 + g*x)^2) - (B^2*(b*c - a*d)^3*g^3*n^2*(c + d*x))/(6*(b*f - a*g)^3*(d*f -
c*g)^4*(f + g*x)) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*n^2*
(c + d*x))/(4*(b*f - a*g)^3*(d*f - c*g)^4*(f + g*x)) + (B*(b*c - a*d)*g^3*n
*(c + d*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(6*(b*f - a*g)*(d*f -
c*g)^4*(f + g*x)^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*n*(c +
 d*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*f - a*g)^2*(d*f - c*g
)^4*(f + g*x)^2) + (B*(b*c - a*d)*g*(3*a^2*d^2*g^2 - 2*a*b*d*g*(4*d*f - c*g
) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*n*(a + b*x)*(A + B*Log[e*((a + b
*x)/(c + d*x))^n]))/(2*(b*f - a*g)^4*(d*f - c*g)^3*(f + g*x)) + (b^4*(A + B
*Log[e*((a + b*x)/(c + d*x))^n])^2)/(4*g*(b*f - a*g)^4) - (A + B*Log[e*((a
+ b*x)/(c + d*x))^n])^2/(4*g*(f + g*x)^4) - (B^2*(b*c - a*d)^4*g^3*n^2*Log[
(a + b*x)/(c + d*x)])/(6*(b*f - a*g)^4*(d*f - c*g)^4) + (B^2*(b*c - a*d)^3*
g^2*(4*b*d*f - b*c*g - 3*a*d*g)*n^2*Log[(a + b*x)/(c + d*x)])/(4*(b*f - a*g
)^4*(d*f - c*g)^4) + (B^2*(b*c - a*d)^4*g^3*n^2*Log[(f + g*x)/(c + d*x)])/(
6*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - b*c*g -
3*a*d*g)*n^2*Log[(f + g*x)/(c + d*x)])/(4*(b*f - a*g)^4*(d*f - c*g)^4) + (B
^2*(b*c - a*d)^2*g*(3*a^2*d^2*g^2 - 2*a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^
2 - 4*c*d*f*g + c^2*g^2))*n^2*Log[(f + g*x)/(c + d*x)])/(2*(b*f - a*g)^4*(d
*f - c*g)^4) - (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^
2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x
)/(c + d*x))^n])*Log[1 - ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/
(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g
)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n^2
*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/(2*(b*f - a*g
)^4*(d*f - c*g)^4)
```

Rubi [A] time = 3.54545, antiderivative size = 1968, normalized size of antiderivative = 1.63, number of steps used = 41, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^5,x]

[Out] -(B^2*(b*c - a*d)^2*g*n^2)/(12*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (
5*B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)*n^2)/(12*(b*f - a*g)^3*(d*f
 - c*g)^3*(f + g*x)) + (b^3*B^2*(b*c - a*d)*n^2*Log[a + b*x])/(6*(b*f - a*g
)^4*(d*f - c*g)) + (b^2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*n^2*Log[a
 + b*x])/(4*(b*f - a*g)^4*(d*f - c*g)^2) + (b*B^2*(b*c - a*d)*(a^2*d^2*g^2
- a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[a
+ b*x])/(2*(b*f - a*g)^4*(d*f - c*g)^3) - (b^4*B^2*n^2*Log[a + b*x]^2)/(4*g
*(b*f - a*g)^4) - (B*(b*c - a*d)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/
(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(4*(b*f - a*g)^2*(d*f - c
*g)^2*(f + g*x)^2) - (B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))
^n]))/(2*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*n*Log[a + b*x]*(A
+ B*Log[e*((a + b*x)/(c + d*x))^n]))/(2*g*(b*f - a*g)^4) - (A + B*Log[e*((a
 + b*x)/(c + d*x))^n])^2/(4*g*(f + g*x)^4) - (B^2*d^3*(b*c - a*d)*n^2*Log[c
 + d*x])/(6*(b*f - a*g)*(d*f - c*g)^4) - (B^2*d^2*(b*c - a*d)*(2*b*d*f - b*
c*g - a*d*g)*n^2*Log[c + d*x])/(4*(b*f - a*g)^2*(d*f - c*g)^4) - (B^2*d*(b*
c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g
+ c^2*g^2))*n^2*Log[c + d*x])/(2*(b*f - a*g)^3*(d*f - c*g)^4) + (B^2*d^4*n^
2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*g*(d*f - c*g)^4) - (B*
d^4*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/(2*g*(d*f - c*g)
^4) - (B^2*d^4*n^2*Log[c + d*x]^2)/(4*g*(d*f - c*g)^4) + (b^4*B^2*n^2*Log[a
 + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*g*(b*f - a*g)^4) + (B^2*(b*c - a
*d)^2*g*(2*b*d*f - b*c*g - a*d*g)^2*n^2*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f
 - c*g)^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*n^2*Log[f + g*x])/(3*(b*f - a*g)^4*(
d*f - c*g)^4) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g -
 a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n^2*Log[-((g*(a + b*x
))/(b*f - a*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c -
a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^
2 - 2*c*d*f*g + c^2*g^2))*n*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[f +
g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2
))*n^2*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*
f - c*g)^4) + (b^4*B^2*n^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*g*(
b*f - a*g)^4) + (B^2*d^4*n^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*g*(d
*f - c*g)^4) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g -
a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*n^2*PolyLog[2, (b*(f +
 g*x))/(b*f - a*g)])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*
b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*
d*f*g + c^2*g^2))*n^2*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/(2*(b*f - a*g)
^4*(d*f - c*g)^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{(f+gx)^5}\,dx = -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{(Bn)\int \frac{(bc-ad)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad)n)\int \left(\frac{b^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^{n}\ldots\right.\right.}{(bc-ad)(-df+cg)^4(c+\ldots}\right.}{\ldots}$$

$$= -\frac{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}{4g(f+gx)^4} + \frac{\left(b^5Bn\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}{a+bx}\,dx}{2g(bf-ag)^4} - \frac{\left(Bd^5n\right)\int \frac{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^{n}\ldots\right.}{c+dx}}{2g(df-cg)^4}\ldots$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n\left(A+B\log\left(\ldots\right.\right.}{4(bf-ag)^2(df-cg)^2(f+gx)^2}\ldots$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n\left(A+B\log\left(\ldots\right.\right.}{4(bf-ag)^2(df-cg)^2(f+gx)^2}\ldots$$

$$= -\frac{B(bc-ad)n\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)n\left(A+B\log\left(\ldots\right.\right.}{4(bf-ag)^2(df-cg)^2(f+gx)^2}\ldots$$

$$= -\frac{B^2(bc-ad)^2gn^2}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)n^2}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc\ldots}{6(bf\ldots}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)n^2}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc\ldots}{6(bf\ldots}$$

$$= -\frac{B^2(bc-ad)^2gn^2}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)n^2}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc\ldots}{6(bf\ldots}$$

Mathematica [A] time = 7.32275, size = 1476, normalized size = 1.22

$$B(bc-ad)n\left(\frac{\log(a+bx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)b^4}{(bc-ad)(bf-ag)^4}-\frac{Bn\left(\log^2(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a+bx)-2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\right)b^4}{2(bc-ad)(bf-ag)^4}-\frac{g\left(\left(3d^2f^2-3cdgf+c^2g^2\right)b^2-adg\cdots}{(bf-ag\cdots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(f + g*x)^5,x]
```

```
[Out] -(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2/(4*g*(f + g*x)^4) + (B*(b*c - a*d
)*n*(-(g*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/(3*(b*f - a*g)*(d*f - c*g)
*(f + g*x)^3) - (g*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[e*((a + b*x)/(c + d
*x))^n]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 - a
*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[e*
((a + b*x)/(c + d*x))^n]))/((b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*L
og[a + b*x]*(A + B*Log[e*((a + b*x)/(c + d*x))^n]))/((b*c - a*d)*(b*f - a*g
)^4) - (d^4*(A + B*Log[e*((a + b*x)/(c + d*x))^n])*Log[c + d*x])/((b*c - a*
d)*(d*f - c*g)^4) + (g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 - 2*b^2*c*d
*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(A + B*Log[e*((a + b*x)/(
c + d*x))^n])*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) + (B*(b*c - a*d)*
g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g
^2))*n*((b*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)) - (d*Log[c + d*x])/((b*c
 - a*d)*(d*f - c*g)) + (g*Log[f + g*x])/((b*f - a*g)*(d*f - c*g))))/((b*f -
 a*g)^3*(d*f - c*g)^3) - (B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*n*(g/((
b*f - a*g)*(d*f - c*g)*(f + g*x)) - (b^2*Log[a + b*x])/((b*c - a*d)*(b*f -
a*g)^2) + (d^2*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^2) - (g*(2*b*d*f - b*
c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)))/(2*(b*f - a*g)^2
*(d*f - c*g)^2) - (B*(b*c - a*d)*g*n*(g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^
2) + (2*g*(2*b*d*f - b*c*g - a*d*g))/((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)
) - (2*b^3*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^3) + (2*d^3*Log[c + d*x])
/((b*c - a*d)*(d*f - c*g)^3) - (2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/((b*f - a*g)^3*(d*f -
c*g)^3)))/(6*(b*f - a*g)*(d*f - c*g)) - (b^4*B*n*(Log[a + b*x]^2 - 2*Log[a
+ b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))]))/(2*(b*c - a*d)*(b*f - a*g)^4) + (B*d^4*n*(2*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x] - Log[c + d*x]^2 + 2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)]))/(2*(b*c - a*d)*(d*f - c*g)^4) - (B*g*(2*b*d*f - b*c*g - a*d*g)*
(2*b^2*d^2*f^2 - 2*b^2*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)
*n*(Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x] - Log[-((g*(c + d*x))/(d
*f - c*g))]*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[
2, (d*(f + g*x))/(d*f - c*g)]))/((b*f - a*g)^4*(d*f - c*g)^4)))/(2*g)
```

Maple [F] time = 0.52, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{5}} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x)
```

```
[Out] int((A+B*ln(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x, algorithm="maxima
")
```

```
[Out] 1/12*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
```

```
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x))*A*B*n - 1/4*B^2*(log((d*x +
 c)^n)^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g) + 4*
integrate(-1/2*(2*d*g*x*log(e)^2 + 2*c*g*log(e)^2 + 2*(d*g*x + c*g)*log((b*
x + a)^n)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log((b*x + a)^n) + (d*f*n + (g*
n - 4*g*log(e))*d*x - 4*c*g*log(e) - 4*(d*g*x + c*g)*log((b*x + a)^n))*log(
(d*x + c)^n))/(d*g^6*x^6 + c*f^5*g + (5*d*f*g^5 + c*g^6)*x^5 + 5*(2*d*f^2*g
^4 + c*f*g^5)*x^4 + 10*(d*f^3*g^3 + c*f^2*g^4)*x^3 + 5*(d*f^4*g^2 + 2*c*f^3
*g^3)*x^2 + (d*f^5*g + 5*c*f^4*g^2)*x), x)) - 1/2*A*B*log(e*(b*x/(d*x + c)
+ a/(d*x + c))^n)/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^
4*g) - 1/4*A^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g
)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{B^2 \log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2}{g^5x^5 + 5\,fg^4x^4 + 10\,f^2g^3x^3 + 10\,f^3g^2x^2 + 5\,f^4gx + f^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(d*
x + c))^n) + A^2)/(g^5*x^5 + 5*f*g^4*x^4 + 10*f^2*g^3*x^3 + 10*f^3*g^2*x^2
+ 5*f^4*g*x + f^5), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*((b*x+a)/(d*x+c))**n))**2/(g*x+f)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}{(gx+f)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*((b*x+a)/(d*x+c))^n))^2/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^2/(g*x + f)^5, x)
```

3.76 $\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{(f+gx)^2}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi [A] time = 0.188514, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + 2*f*g*Defe
r[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x] + g^2*Defer[Int][x^2/(A
 + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{f^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{2fgx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{g^2x^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\ &= f^2\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+(2fg)\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+g^2\int \frac{x^2}{A+B\log\left(e\left(\right.\right.}\end{aligned}$$

Mathematica [A] time = 0.414442, size = 0, normalized size = 0.

$$\int \frac{(f+gx)^2}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Maple [A] time = 0.396, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^2\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(gx+f\right)^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{g^2x^2 + 2\,fgx + f^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B*log(e*((b*x + a)/(d*x + c))^n) + A),
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(gx + f)^2}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

3.77 $\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=32

$$\text{Unintegrable}\left(\frac{f+gx}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi [A] time = 0.101737, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] f*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x] + g*Defer[Int]
[x/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx &= \int \left(\frac{f}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}+\frac{gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\right)dx\\
&= f\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx+g\int \frac{x}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx
\end{aligned}$$

Mathematica [A] time = 0.279493, size = 0, normalized size = 0.

$$\int \frac{f+gx}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]),x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n]), x]
```

Maple [A] time = 0.305, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{gx+f}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

3.78 $\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{1}{B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A},x\right)$$

```
[Out] Unintegrable[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x]
```

Rubi [A] time = 0.0150083, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1),x]
```

```
[Out] Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x]
```

Rubi steps

$$\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx=\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Mathematica [A] time = 0.015118, size = 0, normalized size = 0.

$$\int \frac{1}{A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1),x]
```

```
[Out] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-1), x]
```

Maple [A] time = 0.282, size = 0, normalized size = 0.

$$\int \left(A + B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate(1/(B*log(e*((b*x + a)/(d*x + c))^n) + A), x)
```

3.79 $\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi [A] time = 0.0708478, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 0.933164, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Maple [A] time = 0.625, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Agx+Af+(Bgx+Bf)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(A*g*x + A*f + (B*g*x + B*f)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

3.80 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi [A] time = 0.0748452, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 1.05775, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Maple [A] time = 0.506, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ag^{2}x^{2}+2\,Afgx+Af^{2}+\left(Bg^{2}x^{2}+2\,Bfgx+Bf^{2}\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^2*x^2 + 2*A*f*g*x + A*f^2 + (B*g^2*x^2 + 2*B*f*g*x + B*f^2)
*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

3.81 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi [A] time = 0.0724352, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]

[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Mathematica [A] time = 11.9913, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])), x]
```

Maple [A] time = 0.53, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

```
[Out] int(1/(g*x+f)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ag^{3}x^{3}+3\,Afg^{2}x^{2}+3\,Af^{2}gx+Af^{3}+\left(Bg^{3}x^{3}+3\,Bfg^{2}x^{2}+3\,Bf^{2}gx+Bf^{3}\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^3*x^3 + 3*A*f*g^2*x^2 + 3*A*f^2*g*x + A*f^3 + (B*g^3*x^3 +
3*B*f*g^2*x^2 + 3*B*f^2*g*x + B*f^3)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3 \left(B \log \left(e \left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)), x)
```

3.82 $\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{(f+gx)^2}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi [A] time = 0.207001, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + 2*f*g*Defe
r[Int][x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x] + g^2*Defer[Int][x^2/
(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx = \int \left(\frac{f^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{2fgx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{g^2x^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right.$$

$$= f^2\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+(2fg)\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+g^2\int \frac{}{\left(A\right.}$$

Mathematica [A] time = 0.935178, size = 0, normalized size = 0.

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Maple [A] time = 0.418, size = 0, normalized size = 0.

$$\int (gx+f)^2 \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdg^2x^4+acf^2+\left(adg^2+\left(2\,dfg+cg^2\right)b\right)x^3+\left(\left(2\,dfg+cg^2\right)a+\left(df^2+2\,cfg\right)b\right)x^2+\left(bcf^2+\left(df^2+2\,cfg\right)a\right)x}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^2}+\int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] -(b*d*g^2*x^4 + a*c*f^2 + (a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^3 + ((2*d*f*g +
 c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x^2 + (b*c*f^2 + (d*f^2 + 2*c*f*g)*a)*x)/(
(b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n)
 + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrate((4*
b*d*g^2*x^3 + b*c*f^2 + 3*(a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^2 + (d*f^2 + 2*
```

```
c*f*g)*a + 2*((2*d*f*g + c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x)/((b*c*n - a*d*n
)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*
d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{g^2x^2 + 2\,fgx + f^2}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 +
2*A*B*log(e*((b*x + a)/(d*x + c))^n) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(gx + f)^2}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.83 $\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\text{Unintegrable}\left(\frac{f+gx}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi [A] time = 0.113645, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] f*Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x] + g*Defer[Int]
[x/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx &= \int \left(\frac{f}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}+\frac{gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\right)dx\\ &= f\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx+g\int \frac{x}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.695821, size = 0, normalized size = 0.

$$\int \frac{f+gx}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2,x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2, x]
```

Maple [A] time = 0.253, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdgx^3+acf+\left(adg+\left(df+cg\right)b\right)x^2+\left(bcf+\left(df+cg\right)a\right)x}{(bcn-adn)B^2\log\left((bx+a)^n\right)-(bcn-adn)B^2\log\left((dx+c)^n\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^2}+\int -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*g*x^3 + a*c*f + (a*d*g + (d*f + c*g)*b)*x^2 + (b*c*f + (d*f + c*g)*a)
*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x +
c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2) + integrat
e((3*b*d*g*x^2 + b*c*f + (d*f + c*g)*a + 2*(a*d*g + (d*f + c*g)*b)*x)/((b*c
*n - a*d*n)*B^2*log((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (
```

```
b*c*n - a*d*n)*A*B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{gx+f}{B^2\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*
x + a)/(d*x + c))^n) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{gx+f}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2, x)
```

3.84 $\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=26

$$\text{Unintegrable}\left(\frac{1}{\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x]
```

Rubi [A] time = 0.0147984, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2),x]
```

```
[Out] Defer[Int][(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x]
```

Rubi steps

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 0.59263, size = 0, normalized size = 0.

$$\int \frac{1}{\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2),x]
```

```
[Out] Integrate[(A + B*Log[e*((a + b*x)/(c + d*x))^n])^(-2), x]
```

Maple [A] time = 0.321, size = 0, normalized size = 0.

$$\int \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdx^{2}+ac+(bc+ad)x}{(bcn-adn)B^{2}\log\left((bx+a)^{n}\right)-(bcn-adn)B^{2}\log\left((dx+c)^{n}\right)+(bcn-adn)AB+(bcn\log(e)-adn\log(e))B^{2}}+\int \frac{}{(bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*n - a*d*n)*B^2*log((b*x + a)^n) - (b
*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)*A*B + (b*c*n*log(e) -
a*d*n*log(e))*B^2) + integrate((2*b*d*x + b*c + a*d)/((b*c*n - a*d*n)*B^2*l
og((b*x + a)^n) - (b*c*n - a*d*n)*B^2*log((d*x + c)^n) + (b*c*n - a*d*n)*A*
B + (b*c*n*log(e) - a*d*n*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{B^{2}\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)^{2}+2\,AB\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(B^2*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*A*B*log(e*((b*x + a)/(
d*x + c))^n) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log(e*((b*x + a)/(d*x + c))^n) + A)^(-2), x)
```

3.85 $\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(f+gx)\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi [A] time = 0.0782827, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 1.60863, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Maple [A] time = 0.549, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdx^2 + ac + (bc}{(bcfn - adfn)AB + (bcfn\log(e) - adfn\log(e))B^2 + ((bcgn - adgn)AB + (bcgn\log(e) - adgn\log(e))B^2)x + ((bcg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxima
")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f*n - a*d*f*n)*A*B + (b*c*f*n*log(e)
 - a*d*f*n*log(e))*B^2 + ((b*c*g*n - a*d*g*n)*A*B + (b*c*g*n*log(e) - a*d*g
*n*log(e))*B^2)*x + ((b*c*g*n - a*d*g*n)*B^2*x + (b*c*f*n - a*d*f*n)*B^2)*l
og((b*x + a)^n) - ((b*c*g*n - a*d*g*n)*B^2*x + (b*c*f*n - a*d*f*n)*B^2)*log
((d*x + c)^n)) + integrate((b*d*g*x^2 + 2*b*d*f*x + b*c*f + (d*f - c*g)*a)/
((b*c*f^2*n - a*d*f^2*n)*A*B + (b*c*f^2*n*log(e) - a*d*f^2*n*log(e))*B^2 +
((b*c*g^2*n - a*d*g^2*n)*A*B + (b*c*g^2*n*log(e) - a*d*g^2*n*log(e))*B^2)*x
^2 + 2*((b*c*f*g*n - a*d*f*g*n)*A*B + (b*c*f*g*n*log(e) - a*d*f*g*n*log(e))
*B^2)*x + ((b*c*g^2*n - a*d*g^2*n)*B^2*x^2 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*
x + (b*c*f^2*n - a*d*f^2*n)*B^2)*log((b*x + a)^n) - ((b*c*g^2*n - a*d*g^2*n
)*B^2*x^2 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*x + (b*c*f^2*n - a*d*f^2*n)*B^2)*
```

```
log((d*x + c)^n)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABgx + ABf\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log(e*((b*x + a)/(d*x + c))
^n)^2 + 2*(A*B*g*x + A*B*f)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

3.86 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^2\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi [A] time = 0.0813881, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 4.21421, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Maple [A] time = 0.509, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}} \left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^{n}\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(g*x+f)^2/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f^2*n - a*d*f^2*n)*A*B + (b*c*f^2*n*
log(e) - a*d*f^2*n*log(e))*B^2 + ((b*c*g^2*n - a*d*g^2*n)*A*B + (b*c*g^2*n*
log(e) - a*d*g^2*n*log(e))*B^2)*x^2 + 2*((b*c*f*g*n - a*d*f*g*n)*A*B + (b*c
*f*g*n*log(e) - a*d*f*g*n*log(e))*B^2)*x + ((b*c*g^2*n - a*d*g^2*n)*B^2*x^2
 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*x + (b*c*f^2*n - a*d*f^2*n)*B^2)*log((b*x
+ a)^n) - ((b*c*g^2*n - a*d*g^2*n)*B^2*x^2 + 2*(b*c*f*g*n - a*d*f*g*n)*B^2*
x + (b*c*f^2*n - a*d*f^2*n)*B^2)*log((d*x + c)^n)) - integrate(-(b*c*f + (d
*f - 2*c*g)*a - (a*d*g - (2*d*f - c*g)*b)*x)/(((b*c*g^3*n - a*d*g^3*n)*A*B
+ (b*c*g^3*n*log(e) - a*d*g^3*n*log(e))*B^2)*x^3 + (b*c*f^3*n - a*d*f^3*n)*
A*B + (b*c*f^3*n*log(e) - a*d*f^3*n*log(e))*B^2 + 3*((b*c*f*g^2*n - a*d*f*g
^2*n)*A*B + (b*c*f*g^2*n*log(e) - a*d*f*g^2*n*log(e))*B^2)*x^2 + 3*((b*c*f^
2*g*n - a*d*f^2*g*n)*A*B + (b*c*f^2*g*n*log(e) - a*d*f^2*g*n*log(e))*B^2)*x
```

```
 + ((b*c*g^3*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2*n)*B^2*x^2
 + 3*(b*c*f^2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)*B^2)*log((
b*x + a)^n) - ((b*c*g^3*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2
*n)*B^2*x^2 + 3*(b*c*f^2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)
*B^2)*log((d*x + c)^n)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2g^2x^2 + 2\,A^2fgx + A^2f^2 + \left(B^2g^2x^2 + 2\,B^2fgx + B^2f^2\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(ABg^2x^2 + 2\,ABfgx + ABf^2\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*
x + B^2*f^2)*log(e*((b*x + a)/(d*x + c))^n)^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*
x + A*B*f^2)*log(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^2\left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

3.87 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^3\left(B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi [A] time = 0.0798446, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]

[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx = \int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Mathematica [A] time = 36.6298, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(e\left(\frac{a+bx}{c+dx}\right)^n\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[e*((a + b*x)/(c + d*x))^n])^2), x]
```

Maple [A] time = 0.521, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3}\left(A+B\ln\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

```
[Out] int(1/(g*x+f)^3/(A+B*ln(e*((b*x+a)/(d*x+c))^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="maxi
ma")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/(((b*c*g^3*n - a*d*g^3*n)*A*B + (b*c*g^3*n
*log(e) - a*d*g^3*n*log(e))*B^2)*x^3 + (b*c*f^3*n - a*d*f^3*n)*A*B + (b*c*f
^3*n*log(e) - a*d*f^3*n*log(e))*B^2 + 3*((b*c*f*g^2*n - a*d*f*g^2*n)*A*B +
(b*c*f*g^2*n*log(e) - a*d*f*g^2*n*log(e))*B^2)*x^2 + 3*((b*c*f^2*g*n - a*d*
f^2*g*n)*A*B + (b*c*f^2*g*n*log(e) - a*d*f^2*g*n*log(e))*B^2)*x + ((b*c*g^3
*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2*n)*B^2*x^2 + 3*(b*c*f^
2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)*B^2)*log((b*x + a)^n)
- ((b*c*g^3*n - a*d*g^3*n)*B^2*x^3 + 3*(b*c*f*g^2*n - a*d*f*g^2*n)*B^2*x^2
+ 3*(b*c*f^2*g*n - a*d*f^2*g*n)*B^2*x + (b*c*f^3*n - a*d*f^3*n)*B^2)*log((d
*x + c)^n)) - integrate((b*d*g*x^2 - b*c*f - (d*f - 3*c*g)*a + 2*(a*d*g - (
d*f - c*g)*b)*x)/((((b*c*g^4*n - a*d*g^4*n)*A*B + (b*c*g^4*n*log(e) - a*d*g^
4*n*log(e))*B^2)*x^4 + 4*((b*c*f*g^3*n - a*d*f*g^3*n)*A*B + (b*c*f*g^3*n*lo
```

```
g(e) - a*d*f*g^3*n*log(e))*B^2)*x^3 + (b*c*f^4*n - a*d*f^4*n)*A*B + (b*c*f^
4*n*log(e) - a*d*f^4*n*log(e))*B^2 + 6*((b*c*f^2*g^2*n - a*d*f^2*g^2*n)*A*B
 + (b*c*f^2*g^2*n*log(e) - a*d*f^2*g^2*n*log(e))*B^2)*x^2 + 4*((b*c*f^3*g*n
 - a*d*f^3*g*n)*A*B + (b*c*f^3*g*n*log(e) - a*d*f^3*g*n*log(e))*B^2)*x + ((
b*c*g^4*n - a*d*g^4*n)*B^2*x^4 + 4*(b*c*f*g^3*n - a*d*f*g^3*n)*B^2*x^3 + 6*
(b*c*f^2*g^2*n - a*d*f^2*g^2*n)*B^2*x^2 + 4*(b*c*f^3*g*n - a*d*f^3*g*n)*B^2
*x + (b*c*f^4*n - a*d*f^4*n)*B^2)*log((b*x + a)^n) - ((b*c*g^4*n - a*d*g^4*
n)*B^2*x^4 + 4*(b*c*f*g^3*n - a*d*f*g^3*n)*B^2*x^3 + 6*(b*c*f^2*g^2*n - a*d
*f^2*g^2*n)*B^2*x^2 + 4*(b*c*f^3*g*n - a*d*f^3*g*n)*B^2*x + (b*c*f^4*n - a*
d*f^4*n)*B^2)*log((d*x + c)^n)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)^2 + 2\left(A\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*
g^3*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log(e*((b*x + a)/(d*x
+ c))^n)^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*lo
g(e*((b*x + a)/(d*x + c))^n)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*((b*x+a)/(d*x+c))**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3 \left(B\log\left(e\left(\frac{bx+a}{dx+c}\right)^n\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*((b*x+a)/(d*x+c))^n))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log(e*((b*x + a)/(d*x + c))^n) + A)^2), x)
```

3.88 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=180

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b}+\frac{Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{Bg^4(bc-ad)^5}{5bd^5}$$

```
[Out] (B*(b*c - a*d)^4*g^4*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(10*b*d
^3) + (B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g^4*(a
+ b*x)^4)/(20*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(5*b) - (B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5)
```

Rubi [A] time = 0.123745, antiderivative size = 180, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5b}+\frac{Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{Bg^4(bc-ad)^5}{5bd^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^4*g^4*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(10*b*d
^3) + (B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g^4*(a
+ b*x)^4)/(20*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))
/(5*b) - (B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b}-\frac{B\int\frac{(bc-ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg}\\ &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b}-\frac{\left(B(bc-ad)g^4\right)\int\frac{(a+bx)^4}{c+dx}\,dx}{5b}\\ &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5b}-\frac{\left(B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3}{d^4}+\frac{b(bc-ad)^2(a\cdots}{d^3}\right.}{}\\ &= \frac{B(bc-ad)^4g^4x}{5d^4}-\frac{B(bc-ad)^3g^4(a+bx)^2}{10bd^3}+\frac{B(bc-ad)^2g^4(a+bx)^3}{15bd^2}-\frac{B(bc\cdots}{}\end{aligned}$$

Mathematica [A] time = 0.1062, size = 142, normalized size = 0.79

$$\frac{g^4\left((a+bx)^5\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)\left(6d^2(a+bx)^2(bc-ad)^2+4d^3(a+bx)^3(ad-bc)-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(a+bx)^4\right)}{12d^5}\right)}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(b*c - a*d)*(-1
2*b*d*(b*c - a*d)^3*x + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(-(b*c) + a
*d)*(a + b*x)^3 + 3*d^4*(a + b*x)^4 + 12*(b*c - a*d)^4*Log[c + d*x]))/(12*d
^5)))/(5*b)
```

Maple [B] time = 0.225, size = 8417, normalized size = 46.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.2001, size = 841, normalized size = 4.67

$$\frac{1}{5}\,Ab^4g^4x^5 + Aab^3g^4x^4 + 2\,Aa^2b^2g^4x^3 + 2\,Aa^3bg^4x^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log\left(bx+a\right)}{b} - \frac{c\log\left(dx+c\right)}{d}\right)Ba^4g$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x
 + c)/d)*B*a^4*g^4 + 2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(
b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^3*b*g^4 + (2
*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*
log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2
*d^2))*B*a^2*b^2*g^4 + 1/6*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*
a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*
x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B
*a*b^3*g^4 + 1/60*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log
(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 -
4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4
*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

Fricas [B] time = 1.36423, size = 910, normalized size = 5.06

$$12\,Ab^5d^5g^4x^5 + 12\,Ba^5d^5g^4\log\left(bx+a\right) - 3\left(Bb^5cd^4 - (20\,A+B)ab^4d^5\right)g^4x^4 + 4\left(Bb^5c^2d^3 - 5\,Bab^4cd^4 + 2\,(15\,A+2\,B)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 12*B*a^5*d^5*g^4*log(b*x + a) - 3*(B*b^5*c*d^4
 - (20*A + B)*a*b^4*d^5)*g^4*x^4 + 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 + 2*(
15*A + 2*B)*a^2*b^3*d^5)*g^4*x^3 - 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 1
0*B*a^2*b^3*c*d^4 - 2*(10*A + 3*B)*a^3*b^2*d^5)*g^4*x^2 + 12*(B*b^5*c^4*d -
 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 10*B*a^3*b^2*c*d^4 + (5*A + 4*B
)*a^4*b*d^5)*g^4*x - 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2
 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 12*(B*b^5*d^5
*g^4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*
d^5*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^5)
```

Sympy [B] time = 10.0173, size = 993, normalized size = 5.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**4*g**4*x**5/5 + B*a**5*g**4*log(x + (B*a**6*d**5*g**4/b + 5*B*a**5*c*d
**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b**2*c**3*d**2*g**4 - 5*B
*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4)/(B*a**5*d**5*g**4 + 5*B*a**4*b
*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d**2*g**
4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*b) - B*c*g**4*(5*a**4*d*
*4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**
4)*log(x + (6*B*a**5*c*d**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b
**2*c**3*d**2*g**4 - 5*B*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4 - B*a*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4) + B*b*c**2*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**
2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/(B*a**5*d**5*g**4 + 5*B*
a**4*b*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d*
*2*g**4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*d**5) + (B*a**4*g*
*4*x + 2*B*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g**4*x**3 + B*a*b**3*g**4*x**4
+ B*b**4*g**4*x**5/5)*log(e*(a + b*x)/(c + d*x)) + x**4*(20*A*a*b**3*d*g**4
 + B*a*b**3*d*g**4 - B*b**4*c*g**4)/(20*d) + x**3*(30*A*a**2*b**2*d**2*g**4
 + 4*B*a**2*b**2*d**2*g**4 - 5*B*a*b**3*c*d*g**4 + B*b**4*c**2*g**4)/(15*d*
*2) + x**2*(20*A*a**3*b*d**3*g**4 + 6*B*a**3*b*d**3*g**4 - 10*B*a**2*b**2*c
*d**2*g**4 + 5*B*a*b**3*c**2*d*g**4 - B*b**4*c**3*g**4)/(10*d**3) + x*(5*A*
a**4*d**4*g**4 + 4*B*a**4*d**4*g**4 - 10*B*a**3*b*c*d**3*g**4 + 10*B*a**2*b
**2*c**2*d**2*g**4 - 5*B*a*b**3*c**3*d*g**4 + B*b**4*c**4*g**4)/(5*d**4)
```

Giac [B] time = 99.387, size = 639, normalized size = 3.55

$$\frac{Ba^5g^4\log\left(bx+a\right)}{5\,b}+\frac{1}{5}\left(Ab^4g^4+Bb^4g^4\right)x^5-\frac{\left(Bb^4cg^4-20\,Aab^3dg^4-21\,Bab^3dg^4\right)x^4}{20\,d}+\frac{\left(Bb^4c^2g^4-5\,Bab^3cdg^4+30\,Aa\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/5*B*a^5*g^4*log(b*x + a)/b + 1/5*(A*b^4*g^4 + B*b^4*g^4)*x^5 - 1/20*(B*b^
4*c*g^4 - 20*A*a*b^3*d*g^4 - 21*B*a*b^3*d*g^4)*x^4/d + 1/15*(B*b^4*c^2*g^4
- 5*B*a*b^3*c*d*g^4 + 30*A*a^2*b^2*d^2*g^4 + 34*B*a^2*b^2*d^2*g^4)*x^3/d^2
+ 1/5*(B*b^4*g^4*x^5 + 5*B*a*b^3*g^4*x^4 + 10*B*a^2*b^2*g^4*x^3 + 10*B*a^3*
b*g^4*x^2 + 5*B*a^4*g^4*x)*log((b*x + a)/(d*x + c)) - 1/10*(B*b^4*c^3*g^4 -
 5*B*a*b^3*c^2*d*g^4 + 10*B*a^2*b^2*c*d^2*g^4 - 20*A*a^3*b*d^3*g^4 - 26*B*a
^3*b*d^3*g^4)*x^2/d^3 + 1/5*(B*b^4*c^4*g^4 - 5*B*a*b^3*c^3*d*g^4 + 10*B*a^2
*b^2*c^2*d^2*g^4 - 10*B*a^3*b*c*d^3*g^4 + 5*A*a^4*d^4*g^4 + 9*B*a^4*d^4*g^4
)*x/d^4 - 1/5*(B*b^4*c^5*g^4 - 5*B*a*b^3*c^4*d*g^4 + 10*B*a^2*b^2*c^3*d^2*g
^4 - 10*B*a^3*b*c^2*d^3*g^4 + 5*B*a^4*c*d^4*g^4)*log(-d*x - c)/d^5
```

3.89 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=149

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b}-\frac{Bg^3x(bc-ad)^3}{4d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}-\frac{Bg^3(a+bx)^3}{12b}$$

```
[Out] -(B*(b*c - a*d)^3*g^3*x)/(4*d^3) + (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(8*b*d
^2) - (B*(b*c - a*d)*g^3*(a + b*x)^3)/(12*b*d) + (g^3*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(4*b) + (B*(b*c - a*d)^4*g^3*Log[c + d*x])/(4*
b*d^4)
```

Rubi [A] time = 0.0962254, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4b}-\frac{Bg^3x(bc-ad)^3}{4d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}-\frac{Bg^3(a+bx)^3}{12b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^3*g^3*x)/(4*d^3) + (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(8*b*d
^2) - (B*(b*c - a*d)*g^3*(a + b*x)^3)/(12*b*d) + (g^3*(a + b*x)^4*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(4*b) + (B*(b*c - a*d)^4*g^3*Log[c + d*x])/(4*
b*d^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b}-\frac{B\int\frac{(bc-ad)g^4(a+bx)^3}{c+dx}dx}{4bg}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b}-\frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3}{c+dx}dx}{4b}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b}-\frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2}{d^3}-\frac{b(bc-ad)(a+\cdots}{d^2}\cdots\right.}{4b}$$

$$=-\frac{B(bc-ad)^3g^3x}{4d^3}+\frac{B(bc-ad)^2g^3(a+bx)^2}{8bd^2}-\frac{B(bc-ad)g^3(a+bx)^3}{12bd}+\frac{g^3(\cdots}{\cdots}$$

Mathematica [A] time = 0.0977591, size = 120, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{6d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(b*c - a*d)*(6*
b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3
- 6*(b*c - a*d)^3*Log[c + d*x]))/(6*d^4)))/(4*b)
```

Maple [B] time = 0.18, size = 5556, normalized size = 37.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.22249, size = 593, normalized size = 3.98

$$\frac{1}{4}Ab^3g^3x^4 + Aab^2g^3x^3 + \frac{3}{2}Aa^2bg^3x^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Ba^3g^3 + \frac{3}{2}\left(x^2\log\left(\frac{}{d}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(b*e*x/(d
*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^3*g^3 +
 3/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2
*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + 1/2*(2*x^3*log(b*e*x
/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d
^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2
*g^3 + 1/24*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a
)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^
2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^3 + A*a^
3*g^3*x
```

Fricas [B] time = 1.13677, size = 664, normalized size = 4.46

$$\frac{6\,Ab^4d^4g^3x^4 + 6\,Ba^4d^4g^3\log(bx+a) - 2\left(Bb^4cd^3 - (12\,A+B)ab^3d^4\right)g^3x^3 + 3\left(Bb^4c^2d^2 - 4\,Bab^3cd^3 + 3\,(4\,A+B)a^2b^2d^4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 + 6*B*a^4*d^4*g^3*log(b*x + a) - 2*(B*b^4*c*d^3 -
 (12*A + B)*a*b^3*d^4)*g^3*x^3 + 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + 3*(4*
A + B)*a^2*b^2*d^4)*g^3*x^2 - 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*
```

```
b^2*c*d^3 - (4*A + 3*B)*a^3*b*d^4)*g^3*x + 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 6*(B*b^4*d^4*g^3
*x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*
x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^4)
```

Sympy [B] time = 7.13052, size = 719, normalized size = 4.83

$$\frac{Ab^3g^3x^4}{4} + \frac{Ba^4g^3\log\left(x + \frac{\frac{Ba^5d^4g^3}{b} + 4Ba^4cd^3g^3 - 6Ba^3bc^2d^2g^3 + 4Ba^2b^2c^3dg^3 - Bab^3c^4g^3}{Ba^4d^4g^3 + 4Ba^3bcd^3g^3 - 6Ba^2b^2c^2d^2g^3 + 4Bab^3c^3dg^3 - Bb^4c^4g^3}\right)}{4b} - \frac{Bcg^3(2ad - bc)\left(2a^2d^2 - 2abcd + b^2c^2\right)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**3*g**3*x**4/4 + B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*b) - B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*d**4) + (B*a**3*g**3*x + 3*B*a**2
*b*g**3*x**2/2 + B*a*b**2*g**3*x**3 + B*b**3*g**3*x**4/4)*log(e*(a + b*x)/(
c + d*x)) + x**3*(12*A*a*b**2*d*g**3 + B*a*b**2*d*g**3 - B*b**3*c*g**3)/(12
*d) + x**2*(12*A*a**2*b*d**2*g**3 + 3*B*a**2*b*d**2*g**3 - 4*B*a*b**2*c*d*g
**3 + B*b**3*c**2*g**3)/(8*d**2) + x*(4*A*a**3*d**3*g**3 + 3*B*a**3*d**3*g*
*3 - 6*B*a**2*b*c*d**2*g**3 + 4*B*a*b**2*c**2*d*g**3 - B*b**3*c**3*g**3)/(4
*d**3)
```

Giac [B] time = 21.8869, size = 458, normalized size = 3.07

$$\frac{Ba^4g^3\log(bx + a)}{4\,b} + \frac{1}{4}\left(Ab^3g^3 + Bb^3g^3\right)x^4 - \frac{\left(Bb^3cg^3 - 12\,Aab^2dg^3 - 13\,Bab^2dg^3\right)x^3}{12\,d} + \frac{1}{4}\left(Bb^3g^3x^4 + 4\,Bab^2g^3x^3 + 6\,B\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/4*B*a^4*g^3*log(b*x + a)/b + 1/4*(A*b^3*g^3 + B*b^3*g^3)*x^4 - 1/12*(B*b^
3*c*g^3 - 12*A*a*b^2*d*g^3 - 13*B*a*b^2*d*g^3)*x^3/d + 1/4*(B*b^3*g^3*x^4 +
 4*B*a*b^2*g^3*x^3 + 6*B*a^2*b*g^3*x^2 + 4*B*a^3*g^3*x)*log((b*x + a)/(d*x
+ c)) + 1/8*(B*b^3*c^2*g^3 - 4*B*a*b^2*c*d*g^3 + 12*A*a^2*b*d^2*g^3 + 15*B*
a^2*b*d^2*g^3)*x^2/d^2 - 1/4*(B*b^3*c^3*g^3 - 4*B*a*b^2*c^2*d*g^3 + 6*B*a^2
*b*c*d^2*g^3 - 4*A*a^3*d^3*g^3 - 7*B*a^3*d^3*g^3)*x/d^3 + 1/4*(B*b^3*c^4*g^
3 - 4*B*a*b^2*c^3*d*g^3 + 6*B*a^2*b*c^2*d^2*g^3 - 4*B*a^3*c*d^3*g^3)*log(d*
x + c)/d^4
```

3.90 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=118

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b}+\frac{Bg^2x(bc-ad)^2}{3d^2}-\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

```
[Out] (B*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B*(b*c - a*d)*g^2*(a + b*x)^2)/(6*b*d) +
 (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b) - (B*(b*c - a
*d)^3*g^2*Log[c + d*x])/(3*b*d^3)
```

Rubi [A] time = 0.0792376, antiderivative size = 118, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3b}+\frac{Bg^2x(bc-ad)^2}{3d^2}-\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B*(b*c - a*d)*g^2*(a + b*x)^2)/(6*b*d) +
 (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b) - (B*(b*c - a
*d)^3*g^2*Log[c + d*x])/(3*b*d^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b} - \frac{B\int\frac{(bc-ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b} - \frac{\left(B(bc-ad)g^2\right)\int\frac{(a+bx)^2}{c+dx}\,dx}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b} - \frac{\left(B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{d^2}+\frac{b(a+bx)}{d}+\frac{(\ldots}{\ldots}\right.}{3b}$$

$$= \frac{B(bc-ad)^2g^2x}{3d^2} - \frac{B(bc-ad)g^2(a+bx)^2}{6bd} + \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b}$$

Mathematica [A] time = 0.0537513, size = 99, normalized size = 0.84

$$\frac{g^2\left(\frac{B(ad-bc)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{2d^3}+(a+bx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*(-(b*c) + a*d)*
(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c - a*d)^2*Log[c + d*x])
)/(2*d^3)))/(3*b)
```

Maple [B] time = 0.162, size = 3283, normalized size = 27.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] e*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+1
/d*B*g^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*c+1/3/d^3*B*g^2*b^2*ln
(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^3+1/3*e^3*A*g^2*b^2/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^3*a^3+e^2*A*g^2*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3+1/6*e^
2*B*g^2*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3+5*e^3*d*B*g^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^4/(d*x+c)^3*c^2*b+5*e^3/
d*B*g^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3
*a^2/(d*x+c)^3*c^4-5*e^2/d^2*B*g^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^4/(d*x+c)^2*a+10*e^2/d*B*g^2*b^2*ln(b*e/d+(a*
d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3/(d*x+c)^2*a^2+6*e/d
*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2/(d
*x+c)*c^2*b-2*e^3/d^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^3*a*c^5/(d*x+c)^3*b^4-4*e/d^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3/(d*x+c)*a-3*e/d*B*g^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*c*b+e/d^3*B*g^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^4/(d*x+
c)+e*d*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)*a^4/(d*x+c)+5*e^2*d*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-
e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2*c+e^3/d^2*B*g^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^2*a-2*e^3*d^2*B*g^2*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5/(d*x+c)^3*c+1/3*e^3/
d^3*B*g^2*b^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
^3*c^6/(d*x+c)^3-e^2*d^2*B*g^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^2*a^5/(d*x+c)^2+e^2/d^3*B*g^2*b^4*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^5/(d*x+c)^2+1/3*e^3*d^3*B*g^2/
b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+
c)^3-3*e^2/d*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)^2*a^2*b^2*c-e^3/d*B*g^2*b^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*a^2*c+3*e^2/d^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*b^3*c^2+3*e/d^2*B*g^2*ln(b*e/d+(a*d-b*c
)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*a-20/3*e^3*B*g^2*b^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3/(d*x+c)^
3*c^3-10*e^2*B*g^2*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)^2*c^2/(d*x+c)^2*a^3+2/3*e*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3+e
*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3-1/3*B*g^2/b*ln(d*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-b*e)*a^3-3*e^2/d*A*g^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2
*c+2*e/d^2*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*b^2*c^2+e^3/d^2*A*g^2*b^4/
(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*c^2+3*e^2/d^2*A*g^2*b^3/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^2*a*c^2-3*e/d*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2*b*c+3*e/
d^2*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^2*c^2*a-2*e/d*B*g^2/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)*a^2*b*c+1/2*e^2/d^2*B*g^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^2*a*c^2-e^3/d*A*g^2*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c-4*e*B*g^2*l
```

```
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)*c-
1/3*e^3/d^3*B*g^2*b^5*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^3*c^3-e^2/d^3*B*g^2*b^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^2*c^3-e/d^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^3/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3-1/2*e^2/d*B*g^2*b^2/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)^2*a^2*c-e/d^3*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3-2/3*e/d^3
*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b^3*c^3-1/3*e^3/d^3*A*g^2*b^5/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^3*c^3-e^2/d^3*A*g^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
^2*c^3-1/6*e^2/d^3*B*g^2*b^4/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3+e^2*B*g^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*b-1/d^2
*B*g^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a*c^2*b+1/3*e^3*B*g^2*b^2*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3
```

Maxima [B] time = 1.17322, size = 378, normalized size = 3.2

$$\frac{1}{3}Ab^2g^2x^3 + Aabg^2x^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Ba^2g^2 + \left(x^2\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) -\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(b*e*x/(d*x + c
) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a
*d)*x/(b*d))*B*a*b*g^2 + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2
- 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

Fricas [B] time = 1.09247, size = 467, normalized size = 3.96

$$\frac{2\,Ab^3d^3g^2x^3 + 2\,Ba^3d^3g^2\log(bx+a) - \left(Bb^3cd^2 - (6\,A+B)ab^2d^3\right)g^2x^2 + 2\left(Bb^3c^2d - 3\,Bab^2cd^2 + (3\,A+2\,B)a^2bd^3\right)g^2x}{6\,bd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 + 2*B*a^3*d^3*g^2*log(b*x + a) - (B*b^3*c*d^2 - (6
*A + B)*a*b^2*d^3)*g^2*x^2 + 2*(B*b^3*c^2*d - 3*B*a*b^2*c*d^2 + (3*A + 2*B)
```

```
*a^2*b*d^3)*g^2*x - 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*l
og(d*x + c) + 2*(B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*
g^2*x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^3)
```

Sympy [B] time = 5.21757, size = 503, normalized size = 4.26

$$\frac{Ab^2g^2x^3}{3} + \frac{Ba^3g^2\log\left(x + \frac{\frac{Ba^4d^3g^2}{b}+3Ba^3cd^2g^2-3Ba^2bc^2dg^2+Bab^2c^3g^2}{Ba^3d^3g^2+3Ba^2bcd^2g^2-3Bab^2c^2dg^2+Bb^3c^3g^2}\right)}{3b} - \frac{Bcg^2\left(3a^2d^2-3abcd+b^2c^2\right)\log\left(x + \frac{4Ba^3cd^2g^2-3Ba^2bc^2d}{}\right.}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b**2*g**2*x**3/3 + B*a**3*g**2*log(x + (B*a**4*d**3*g**2/b + 3*B*a**3*c*d
**2*g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2)/(B*a**3*d**3*g**2 +
 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**2 + B*b**3*c**3*g**2))/(3*b)
 - B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (4*B*a**3*c*d**2*
g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2 - B*a*c*g**2*(3*a**2*d**
2 - 3*a*b*c*d + b**2*c**2) + B*b*c**2*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*
c**2)/d)/(B*a**3*d**3*g**2 + 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**
2 + B*b**3*c**3*g**2))/(3*d**3) + (B*a**2*g**2*x + B*a*b*g**2*x**2 + B*b**2
*g**2*x**3/3)*log(e*(a + b*x)/(c + d*x)) + x**2*(6*A*a*b*d*g**2 + B*a*b*d*g
**2 - B*b**2*c*g**2)/(6*d) + x*(3*A*a**2*d**2*g**2 + 2*B*a**2*d**2*g**2 - 3
*B*a*b*c*d*g**2 + B*b**2*c**2*g**2)/(3*d**2)
```

Giac [B] time = 4.75747, size = 309, normalized size = 2.62

$$\frac{Ba^3g^2\log(bx+a)}{3\,b} + \frac{1}{3}\left(Ab^2g^2 + Bb^2g^2\right)x^3 - \frac{\left(Bb^2cg^2 - 6\,Aabdg^2 - 7\,Babdg^2\right)x^2}{6\,d} + \frac{1}{3}\left(Bb^2g^2x^3 + 3\,Babg^2x^2 + 3\,Ba^2g^2x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/3*B*a^3*g^2*log(b*x + a)/b + 1/3*(A*b^2*g^2 + B*b^2*g^2)*x^3 - 1/6*(B*b^2
*c*g^2 - 6*A*a*b*d*g^2 - 7*B*a*b*d*g^2)*x^2/d + 1/3*(B*b^2*g^2*x^3 + 3*B*a*
b*g^2*x^2 + 3*B*a^2*g^2*x)*log((b*x + a)/(d*x + c)) + 1/3*(B*b^2*c^2*g^2 -
3*B*a*b*c*d*g^2 + 3*A*a^2*d^2*g^2 + 5*B*a^2*d^2*g^2)*x/d^2 - 1/3*(B*b^2*c^3
```

```
*g^2 - 3*B*a*b*c^2*d*g^2 + 3*B*a^2*c*d^2*g^2)*log(-d*x - c)/d^3
```

3.91 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=81

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}-\frac{Bgx(bc-ad)}{2d}$$

```
[Out] -(B*(b*c - a*d)*g*x)/(2*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/(2*b) + (B*(b*c - a*d)^2*g*Log[c + d*x])/(2*b*d^2)
```

Rubi [A] time = 0.0528924, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}-\frac{Bgx(bc-ad)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*x)/(2*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/(2*b) + (B*(b*c - a*d)^2*g*Log[c + d*x])/(2*b*d^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} - \frac{B\int\frac{(bc-ad)g^2(a+bx)}{c+dx}dx}{2bg}$$
$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\frac{a+bx}{c+dx}dx}{2b}$$
$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\left(\frac{b}{d}+\frac{-bc+ad}{d(c+dx)}\right)dx}{2b}$$
$$= -\frac{B(bc-ad)gx}{2d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2b} + \frac{B(bc-ad)^2g\log(c+dx)}{2bd^2}$$

Mathematica [A] time = 0.0342394, size = 69, normalized size = 0.85

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{B(ad-bc)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*(-(b*c) + a*d)*(b
*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2))/(2*b)
```

Maple [B] time = 0.158, size = 1544, normalized size = 19.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] -1/2*e^2/d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)^2*c^4/(d*x+c)^2*b^3-1/2*e^2*d^2*B*g/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^2-e^2/d*B*g*b^2*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c+2*e^2*d*B*g*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c-3*e^2*
B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*
x+c)^2*c^2*b-e/d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)*c^3/(d*x+c)*b^2+e*d*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d
*x+c)*a-e/(d*x+c)*b*c)*a^3/(d*x+c)-2*e/d*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*b*c+1/d*B*g*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-b*e)*a*c+e*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)*a^2-1/2/d^2*B*g*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2*b+1/2*e
^2*A*g*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2+3*e/d*B*g*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2/(d*x+c)*b*a-e/d*B*g/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)*a*b*c-2*e/d*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*b*c*a+e/
d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*b
^2+1/2*e^2/d^2*A*g*b^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2+e/d^2*A*g/(d*e/(
d*x+c)*a-e/(d*x+c)*b*c)*b^2*c^2+1/2*e/d^2*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)
*b^2*c^2+1/2*e^2*B*g*b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*
x+c)*b*c)^2*a^2+e*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2+2*e^2/d*B*g*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3/(d*x+c)^2*b^2*
a+1/2*e*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-1/2*B*g/b*ln(d*(b*e/d+(a*d-b*
c)*e/d/(d*x+c))-b*e)*a^2+1/2*e^2/d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*b^3-3*e*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2/(d*x+c)*c-e^2/d*A*g*b^2/(d*e/(d*x+c)*a
-e/(d*x+c)*b*c)^2*c*a
```

Maxima [A] time = 1.10547, size = 194, normalized size = 2.4

$$\frac{1}{2}Abgx^2+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log(bx+a)}{b}-\frac{c\log(dx+c)}{d}\right)Bag+\frac{1}{2}\left(x^2\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log(bx+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b
- c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) -
 a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*b*g +
 A*a*g*x
```

Fricas [A] time = 1.05546, size = 278, normalized size = 3.43

$$\frac{Ab^2d^2gx^2 + Ba^2d^2g\log(bx+a) - \left(Bb^2cd - (2A+B)abd^2\right)gx + \left(Bb^2c^2 - 2Babcd\right)g\log(dx+c) + \left(Bb^2d^2gx^2 + 2Babd^2g\right.}{2bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + B*a^2*d^2*g*log(b*x + a) - (B*b^2*c*d - (2*A + B)*a*
b*d^2)*g*x + (B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^2 +
2*B*a*b*d^2*g*x)*log((b*e*x + a*e)/(d*x + c)))/(b*d^2)
```

Sympy [B] time = 4.44988, size = 257, normalized size = 3.17

$$\frac{Abgx^2}{2} + \frac{Ba^2g\log\left(x + \frac{\frac{Ba^3d^2g}{b} + 2Ba^2cdg - Babc^2g}{Ba^2d^2g + 2Babcdg - Bb^2c^2g}\right)}{2b} - \frac{Bcg(2ad-bc)\log\left(x + \frac{3Ba^2cdg - Babc^2g - Bacg(2ad-bc) + \frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g + 2Babcdg - Bb^2c^2g}\right)}{2d^2} + \Big(Bagx +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*b*g*x**2/2 + B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/(2*b) - B*c*g*(2*a*
d - b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B
*b*c**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))
/(2*d**2) + (B*a*g*x + B*b*g*x**2/2)*log(e*(a + b*x)/(c + d*x)) + x*(2*A*a*
d*g + B*a*d*g - B*b*c*g)/(2*d)
```

Giac [A] time = 1.80428, size = 150, normalized size = 1.85

$$\frac{Ba^2g\log(bx+a)}{2b} + \frac{1}{2}\left(Abg + Bbg\right)x^2 + \frac{1}{2}\left(Bbgx^2 + 2Bagx\right)\log\left(\frac{bx+a}{dx+c}\right) - \frac{\left(Bbcg - 2Aadg - 3Badg\right)x}{2d} + \frac{\left(Bbc^2g - 2Ba\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/2*B*a^2*g*log(b*x + a)/b + 1/2*(A*b*g + B*b*g)*x^2 + 1/2*(B*b*g*x^2 + 2*B
*a*g*x)*log((b*x + a)/(d*x + c)) - 1/2*(B*b*c*g - 2*A*a*d*g - 3*B*a*d*g)*x/
d + 1/2*(B*b*c^2*g - 2*B*a*c*d*g)*log(d*x + c)/d^2
```

3.92 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=80

$$\frac{B\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
(b*g)) + (B*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*g)
```

Rubi [A] time = 0.217414, antiderivative size = 120, normalized size of antiderivative = 1.5, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg}+\frac{B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}-\frac{B\log^2(g(a+bx))}{2bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x),x]
```

```
[Out] -(B*Log[g*(a + b*x)]^2)/(2*b*g) + ((A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[a*g + b*g*x])/(b*g) + (B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/
(b*g) + (B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{ag+bgx}dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(ag+bgx)}{e(a+bx)}dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(ag+bgx)}{a+bx}dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \left(\frac{be\log(ag+bgx)}{a+bx}-\frac{de\log(ag+bgx)}{c+dx}\right)dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{\log(ag+bgx)}{a+bx}dx}{g} + \frac{(Bd)\int \frac{\log(ag+bgx)}{c+dx}dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} + \frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - B\int \frac{\log\left(\frac{bg(c+dx)}{bcg-adg}\right)}{ag+bgx}dx \cdots$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} + \frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{B\,\mathrm{Subst}\left(\int \frac{\log(x)}{x}dx, x \cdots\right.}{bg}$$

$$= -\frac{B\log^2(g(a+bx))}{2bg} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{bg} + \frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \cdots$$

Mathematica [A] time = 0.0420439, size = 95, normalized size = 1.19

$$\frac{2B\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+\log(g(a+bx))\left(2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)-B\log(g(a+bx))\right)}{2bg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x),x]
```

```
[Out] (Log[g*(a + b*x)]*(-(B*Log[g*(a + b*x)]) + 2*(A + B*Log[(e*(a + b*x))/(c +
d*x)] + B*Log[(b*(c + d*x))/(b*c - a*d)])) + 2*B*PolyLog[2, (d*(a + b*x))/(
-(b*c) + a*d)])/(2*b*g)
```

Maple [B] time = 0.089, size = 602, normalized size = 7.5

$$\frac{dAa}{g(ad-bc)b}\ln\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)-\frac{Ac}{g(ad-bc)}\ln\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)-\frac{dAa}{g(ad-bc)b}\ln\left(d\left(\frac{be}{d}+\frac{e(ad-bc)}{(dx+c)d}\right)-be\right)+\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] d/g/(a*d-b*c)*A/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/g/(a*d-b*c)*A*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c-d/g/(a*d-b*c)*A/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)*a+1/g/(a*d-b*c)*A*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c+1/2*d
/g/(a*d-b*c)*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/2/g/(a*d-b*c)*B*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-d/g/(a*d-b*c)*B/b*dilog(-(d*(b*e/d+(a*d-b*c
)*e/d/(d*x+c))-b*e)/b/e)*a+1/g/(a*d-b*c)*B*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(
d*x+c))-b*e)/b/e)*c-d/g/(a*d-b*c)*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(
d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+1/g/(a*d-b*c)*B*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B\left(\frac{\log(bx+a)\log(dx+c)}{bg}-\int\frac{bdx\log(e)+bc\log(e)+(2\,bdx+bc+ad)\log(bx+a)}{b^2dgx^2+abcg+\left(b^2cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+ag\right)}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] -B*(log(b*x + a)*log(d*x + c)/(b*g) - integrate((b*d*x*log(e) + b*c*log(e)
+ (2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a
*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(\frac{bex+ae}{dx+c}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*e*x + a*e)/(d*x + c)) + A)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/(b*g*x + a*g), x)
```

3.93 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=63

$$-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{B}{bg^2(a+bx)}$$

```
[Out] -(B/(b*g^2*(a + b*x))) - ((c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(
(b*c - a*d)*g^2*(a + b*x))
```

Rubi [A] time = 0.078977, antiderivative size = 102, normalized size of antiderivative = 1.62, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{bg^2(a+bx)}-\frac{Bd\log(a+bx)}{bg^2(bc-ad)}+\frac{Bd\log(c+dx)}{bg^2(bc-ad)}-\frac{B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] -(B/(b*g^2*(a + b*x))) - (B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (A + B*Lo
g[(e*(a + b*x))/(c + d*x)])/(b*g^2*(a + b*x)) + (B*d*Log[c + d*x])/(b*(b*c
- a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)}+\frac{B\int\frac{bc-ad}{g(a+bx)^2(c+dx)}\,dx}{bg}\\
&= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2}\\
&= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2}-\frac{bd}{(bc-ad)^2(a+bx)}+\frac{d^2}{(bc-ad)^2(c+dx)}\right)dx}{bg^2}\\
&= -\frac{B}{bg^2(a+bx)}-\frac{Bd\log(a+bx)}{b(bc-ad)g^2}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{bg^2(a+bx)}+\frac{Bd\log(c+dx)}{b(bc-ad)g^2}
\end{aligned}$$

Mathematica [A] time = 0.0591164, size = 105, normalized size = 1.67

$$\frac{aAd+(aBd-bBc)\log\left(\frac{e(a+bx)}{c+dx}\right)-Bd(a+bx)\log(a+bx)+aBd\log(c+dx)+aBd-Abc+bBdx\log(c+dx)-bBc}{bg^2(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] (-(A*b*c) - b*B*c + a*A*d + a*B*d - B*d*(a + b*x)*Log[a + b*x] + (-(b*B*c)
+ a*B*d)*Log[(e*(a + b*x))/(c + d*x)] + a*B*d*Log[c + d*x] + b*B*d*x*Log[c
+ d*x])/(b*(b*c - a*d)*g^2*(a + b*x))
```

Maple [B] time = 0.047, size = 373, normalized size = 5.9

$$\frac{deAa}{(ad-bc)^2g^2}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)d}\right)^{-1}-\frac{eAbc}{(ad-bc)^2g^2}\left(\frac{be}{d}+\frac{ae}{dx+c}-\frac{bec}{(dx+c)d}\right)^{-1}+\frac{deBa}{(ad-bc)^2g^2}\ln\left(\frac{be}{d}+\frac{e(ad-}{(dx+c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x)
```

```
[Out] e*d/(a*d-b*c)^2/g^2*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/(a*d-b*c)^2/g
^2*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+e*d/(a*d-b*c)^2/g^2*B/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e/(a*d-b*c)^2
/g^2*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*
b*c+e*d/(a*d-b*c)^2/g^2*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/(a*d-b*c)
^2/g^2*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c
```

Maxima [B] time = 1.15851, size = 178, normalized size = 2.83

$$-B\left(\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{b^2g^2x+abg^2}+\frac{1}{b^2g^2x+abg^2}+\frac{d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}-\frac{d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)-\frac{A}{b^2g^2x+abg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="maxima")
```

```
[Out] -B*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1/(b^2*g^2
*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x + c)/((b^2
*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.07407, size = 177, normalized size = 2.81

$$-\frac{(A+B)bc-(A+B)ad+(Bbdx+Bbc)\log\left(\frac{bex+ae}{dx+c}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="fricas")
```

```
[Out] -((A + B)*b*c - (A + B)*a*d + (B*b*d*x + B*b*c)*log((b*e*x + a*e)/(d*x + c)
))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d)*g^2)
```

Sympy [B] time = 2.56011, size = 231, normalized size = 3.67

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{abg^2+b^2g^2x}-\frac{Bd\log\left(x+\frac{-\frac{Ba^2d^3}{ad-bc}+\frac{2Babcd^2}{ad-bc}+Bad^2-\frac{Bb^2c^2d}{ad-bc}+Bbcd}{2Bbd^2}\right)}{bg^2\left(ad-bc\right)}+\frac{Bd\log\left(x+\frac{\frac{Ba^2d^3}{ad-bc}-\frac{2Babcd^2}{ad-bc}+Bad^2+\frac{Bb^2c^2d}{ad-bc}+Bbcd}{2Bbd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{A+B}{abg^2+b^2g^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(a*b*g**2 + b**2*g**2*x) - B*d*log(x + (-B*a*
*2*d**3/(a*d - b*c) + 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 - B*b**2*c**2*d
/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) + B*d*log(x + (B
*a**2*d**3/(a*d - b*c) - 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 + B*b**2*c**
2*d/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) - (A + B)/(a*
b*g**2 + b**2*g**2*x)
```

Giac [A] time = 1.35968, size = 157, normalized size = 2.49

$$-\frac{Bd\log\left(bx+a\right)}{b^2cg^2-abdg^2}+\frac{Bd\log\left(dx+c\right)}{b^2cg^2-abdg^2}-\frac{B\log\left(\frac{bx+a}{dx+c}\right)}{b^2g^2x+abg^2}-\frac{A+2B}{b^2g^2x+abg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] -B*d*log(b*x + a)/(b^2*c*g^2 - a*b*d*g^2) + B*d*log(d*x + c)/(b^2*c*g^2 - a
*b*d*g^2) - B*log((b*x + a)/(d*x + c))/(b^2*g^2*x + a*b*g^2) - (A + 2*B)/(b
^2*g^2*x + a*b*g^2)
```

3.94 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=144

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}+\frac{Bd}{2bg^3(a+bx)(bc-ad)}-\frac{B}{4bg^3(a+bx)^2}$$

```
[Out] -B/(4*b*g^3*(a + b*x)^2) + (B*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (B*d^2*L
og[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])
/(2*b*g^3*(a + b*x)^2) - (B*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3)
```

Rubi [A] time = 0.0999325, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}+\frac{Bd}{2bg^3(a+bx)(bc-ad)}-\frac{B}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] -B/(4*b*g^3*(a + b*x)^2) + (B*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (B*d^2*L
og[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])
/(2*b*g^3*(a + b*x)^2) - (B*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^3}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{bc-ad}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{2bg^3}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}-\frac{d^3}{(bc-ad)^3(c}\right.}{2bg^3}$$

$$= -\frac{B}{4bg^3(a+bx)^2}+\frac{Bd}{2b(bc-ad)g^3(a+bx)}+\frac{Bd^2\log(a+bx)}{2b(bc-ad)^2g^3}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bg^3(a+bx)^2}-\frac{Bd^2\log(}{2b(bc-}$$

Mathematica [A] time = 0.134859, size = 110, normalized size = 0.76

$$-\frac{2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+\frac{B\left(2d^2(a+bx)^2\log(c+dx)+(bc-ad)(b(c-2dx)-3ad)-2d^2(a+bx)^2\log(a+bx)\right)}{(bc-ad)^2}}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] -(2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*((b*c - a*d)*(-3*a*d + b*(c -
 2*d*x)) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x])
)/(b*c - a*d)^2)/(4*b*g^3*(a + b*x)^2)
```

Maple [B] time = 0.049, size = 777, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x)
```

```
[Out] e*d^2/(a*d-b*c)^3/g^3*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d/(a*d-b*c)
^3/g^3*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-1/2*e^2*d/(a*d-b*c)^3/g^3*
A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/2*e^2/(a*d-b*c)^3/g^3*A*b^2/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+e*d^2/(a*d-b*c)^3/g^3*B/(b*e/d+e/(d*
x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e*d/(a*d-b*c)^3/g
^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*
c+e*d^2/(a*d-b*c)^3/g^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d/(a*d-b*
c)^3/g^3*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-1/2*e^2*d/(a*d-b*c)^3/g^
3*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))
*a+1/2*e^2/(a*d-b*c)^3/g^3*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/4*e^2*d/(a*d-b*c)^3/g^3*B*b/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)^2*a+1/4*e^2/(a*d-b*c)^3/g^3*B*b^2/(b*e/d+e/(d*x+c)*a-e
/d/(d*x+c)*b*c)^2*c
```

Maxima [A] time = 1.08486, size = 344, normalized size = 2.39

$$\frac{1}{4}B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}-\frac{2\,\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{b^3g^3x^2+2\,ab^2g^3x+a^2bg^3}+\frac{2\,d^2\log\left(bx+a\right)}{\left(b^3c^2-2\,ab^2cd+a^2bd\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="maxima")
```

```
[Out] 1/4*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(
d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((
b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*
a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g
^3)
```

Fricas [A] time = 1.00411, size = 455, normalized size = 3.16

$$-\frac{(2\,A+B)b^2c^2-4\,(A+B)abcd+(2\,A+3\,B)a^2d^2-2\left(Bb^2cd-Babd^2\right)x-2\left(Bb^2d^2x^2+2\,Babd^2x-Bb^2c^2+2\,Babcd\right)\mathrm{l}}{4\left(\left(b^5c^2-2\,ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2\,a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2\,a^3b^2cd+a^4bd^2\right)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*A + B)*b^2*c^2 - 4*(A + B)*a*b*c*d + (2*A + 3*B)*a^2*d^2 - 2*(B*b^
2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a
*b*c*d)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2
)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^
2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 4.51528, size = 422, normalized size = 2.93

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}-\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{2bg^3(ad-bc)^2}+\frac{Bd^2\log\left(x+\frac{\frac{Ba^3d^5}{(ad-bc)^2}-\frac{3Ba^2bcd^4}{(ad-bc)^2}+\cdots}{\cdots}\right)}{2bg^3(ad\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b**3*g**
3*x**2) - B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*d**4/(
a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b**3*c**
3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2)
 + B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d - b*
c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d**2/(
a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2) - (2*A*
a*d - 2*A*b*c + 3*B*a*d - B*b*c + 2*B*b*d*x)/(4*a**3*b*d*g**3 - 4*a**2*b**2
*c*g**3 + x**2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 -
8*a*b**3*c*g**3))
```

Giac [A] time = 1.34628, size = 329, normalized size = 2.28

$$\frac{Bd^2\log(bx+a)}{2\left(b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3\right)}-\frac{Bd^2\log(dx+c)}{2\left(b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3\right)}-\frac{B\log\left(\frac{bx+a}{dx+c}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}+\frac{2\cdots}{4\left(b^4cg^3x^2-ab\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] 1/2*B*d^2*log(b*x + a)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/
2*B*d^2*log(d*x + c)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/2*
B*log((b*x + a)/(d*x + c))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 1/4*
(2*B*b*d*x - 2*A*b*c - 3*B*b*c + 2*A*a*d + 5*B*a*d)/(b^4*c*g^3*x^2 - a*b^3*
d*g^3*x^2 + 2*a*b^3*c*g^3*x - 2*a^2*b^2*d*g^3*x + a^2*b^2*c*g^3 - a^3*b*d*g
^3)
```

3.95 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=175

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}-\frac{B}{9bg^4(a+$$

```
[Out] -B/(9*b*g^4*(a + b*x)^3) + (B*d)/(6*b*(b*c - a*d)*g^4*(a + b*x)^2) - (B*d^2
)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (B*d^3*Log[a + b*x])/(3*b*(b*c - a*d)
^3*g^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(3*b*g^4*(a + b*x)^3) + (B*d
^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4)
```

Rubi [A] time = 0.129579, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3bg^4(a+bx)^3}-\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}-\frac{B}{9bg^4(a+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^4,x]
```


```
[Out] -B/(9*b*g^4*(a + b*x)^3) + (B*d)/(6*b*(b*c - a*d)*g^4*(a + b*x)^2) - (B*d^2
)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (B*d^3*Log[a + b*x])/(3*b*(b*c - a*d)
^3*g^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(3*b*g^4*(a + b*x)^3) + (B*d
^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^4}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bg^4(a+bx)^3}+\frac{B\int \frac{bc-ad}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bg^4(a+bx)^3}+\frac{(B(bc-ad))\int \frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bg^4(a+bx)^3}+\frac{(B(bc-ad))\int \left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)^2}-\frac{b}{(bc-ad)}\right.}{3bg^4}$$

$$= -\frac{B}{9bg^4(a+bx)^3}+\frac{Bd}{6b(bc-ad)g^4(a+bx)^2}-\frac{Bd^2}{3b(bc-ad)^2g^4(a+bx)}-\frac{Bd^3\log(a+bx)}{3b(bc-ad)^3g^4}-\frac{A}{}$$

Mathematica [A] time = 0.162892, size = 141, normalized size = 0.81

$$-\frac{\frac{B\left((bc-ad)\left(11a^2d^2+abd(15dx-7c)+b^2\left(2c^2-3cdx+6d^2x^2\right)\right)-6d^3(a+bx)^3\log(c+dx)+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}+6\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{18bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^4,x]
```

```
[Out] -(6*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*((b*c - a*d)*(11*a^2*d^2 + a*
b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)) + 6*d^3*(a + b*x)^
3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(18*b*g^4*
(a + b*x)^3)
```

Maple [B] time = 0.052, size = 1191, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x)
```

```
[Out] e*d^3/(a*d-b*c)^4/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d^2/(a*d-b*
c)^4/g^4*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-e^2*d^2/(a*d-b*c)^4/g^4*
A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+e^2*d/(a*d-b*c)^4/g^4*A*b^2/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/3*e^3*d/(a*d-b*c)^4/g^4*A*b^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/3*e^3/(a*d-b*c)^4/g^4*A*b^3/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^3*c+e*d^3/(a*d-b*c)^4/g^4*B/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e*d^2/(a*d-b*c)^4/g^4*B/(b*
e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+e*d^3/
(a*d-b*c)^4/g^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d^2/(a*d-b*c)^4/g
^4*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-e^2*d^2/(a*d-b*c)^4/g^4*B*b/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+e^2*d
/(a*d-b*c)^4/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))*c-1/2*e^2*d^2/(a*d-b*c)^4/g^4*B*b/(b*e/d+e/(d*x+c)*a-e/d/
(d*x+c)*b*c)^2*a+1/2*e^2*d/(a*d-b*c)^4/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*
x+c)*b*c)^2*c+1/3*e^3*d/(a*d-b*c)^4/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/3*e^3/(a*d-b*c)^4/g^4*B*b^3/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/9*e
^3*d/(a*d-b*c)^4/g^4*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-1/9*e^3/
(a*d-b*c)^4/g^4*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c
```

Maxima [B] time = 1.22489, size = 578, normalized size = 3.3

$$-\frac{1}{18}\,B\left(\frac{6\,b^2d^2x^2+2\,b^2c^2-7\,abcd+11\,a^2d^2-3\left(b^2cd-5\,abd^2\right)x}{\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)g^4x^3+3\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\left(a^2b^4c^2-2\,a^3b^3cd+a^4b^2d^2\right)g^4x+\left(a^3b^3c^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="maxima")
```

```
[Out] -1/18*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
```

```
a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*lo
g(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^
2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*
d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x
^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 1.05122, size = 826, normalized size = 4.72

$$-\frac{2\,(3\,A+B)b^3c^3-9\,(2\,A+B)ab^2c^2d+18\,(A+B)a^2bcd^2-(6\,A+11\,B)a^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)x^2-3\left(Bb^3c^2d-6\,B\right.}{18\left(\left(b^7c^3-3\,ab^6c^2d+3\,a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3\,a^2b^5c^2d+3\,a^3b^4cd^2-a^4b^3d^3\right)g^4x^2+3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="fricas")
```

```
[Out] -1/18*(2*(3*A + B)*b^3*c^3 - 9*(2*A + B)*a*b^2*c^2*d + 18*(A + B)*a^2*b*c*d
^2 - (6*A + 11*B)*a^3*d^3 + 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^
2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 6*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3
*x^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log
((b*e*x + a*e)/(d*x + c)))/((b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4
*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^
5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b
*d^3)*g^4)
```

Sympy [B] time = 6.86449, size = 656, normalized size = 3.75

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}-\frac{Bd^3\log\left(x+\frac{-\frac{Ba^4d^7}{(ad-bc)^3}+\frac{4Ba^3bcd^6}{(ad-bc)^3}-\frac{6Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{4Bab^3c^3d^4}{(ad-bc)^3}+Bad^4-\frac{Bb^4c^4d^3}{(ad-bc)^3}+Bbcd^3}{2Bbd^4}\right)}{3bg^4\,(ad-bc)^3}+\frac{Bd^3\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9*a*b**
3*g**4*x**2 + 3*b**4*g**4*x**3) - B*d**3*log(x + (-B*a**4*d**7/(a*d - b*c)*
```

```
*3 + 4*B*a**3*b*c*d**6/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5/(a*d - b*c)
**3 + 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + B*a*d**4 - B*b**4*c**4*d**3/(a*
d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) + B*d**3*
log(x + (B*a**4*d**7/(a*d - b*c)**3 - 4*B*a**3*b*c*d**6/(a*d - b*c)**3 + 6*
B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3
+ B*a*d**4 + B*b**4*c**4*d**3/(a*d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3
*b*g**4*(a*d - b*c)**3) - (6*A*a**2*d**2 - 12*A*a*b*c*d + 6*A*b**2*c**2 + 1
1*B*a**2*d**2 - 7*B*a*b*c*d + 2*B*b**2*c**2 + 6*B*b**2*d**2*x**2 + x*(15*B*
a*b*d**2 - 3*B*b**2*c*d))/(18*a**5*b*d**2*g**4 - 36*a**4*b**2*c*d*g**4 + 18
*a**3*b**3*c**2*g**4 + x**3*(18*a**2*b**4*d**2*g**4 - 36*a*b**5*c*d*g**4 +
18*b**6*c**2*g**4) + x**2*(54*a**3*b**3*d**2*g**4 - 108*a**2*b**4*c*d*g**4
+ 54*a*b**5*c**2*g**4) + x*(54*a**4*b**2*d**2*g**4 - 108*a**3*b**3*c*d*g**4
 + 54*a**2*b**4*c**2*g**4))
```

Giac [B] time = 1.41307, size = 609, normalized size = 3.48

$$-\frac{Bd^3\log(bx+a)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}+\frac{Bd^3\log(dx+c)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{B}{3\left(b^4g^4x^3+3\,ab^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] -1/3*B*d^3*log(b*x + a)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g^4 + 3*a^2*b^2*c*d^2*
g^4 - a^3*b*d^3*g^4) + 1/3*B*d^3*log(d*x + c)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*
g^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*log((b*x + a)/(d*x + c))
/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) - 1/18*(6*B*
b^2*d^2*x^2 - 3*B*b^2*c*d*x + 15*B*a*b*d^2*x + 6*A*b^2*c^2 + 8*B*b^2*c^2 -
12*A*a*b*c*d - 19*B*a*b*c*d + 6*A*a^2*d^2 + 17*B*a^2*d^2)/(b^6*c^2*g^4*x^3
- 2*a*b^5*c*d*g^4*x^3 + a^2*b^4*d^2*g^4*x^3 + 3*a*b^5*c^2*g^4*x^2 - 6*a^2*b
^4*c*d*g^4*x^2 + 3*a^3*b^3*d^2*g^4*x^2 + 3*a^2*b^4*c^2*g^4*x - 6*a^3*b^3*c*
d*g^4*x + 3*a^4*b^2*d^2*g^4*x + a^3*b^3*c^2*g^4 - 2*a^4*b^2*c*d*g^4 + a^5*b
*d^2*g^4)
```

3.96 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=206

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{}{12bg^5}$$

```
[Out] -B/(16*b*g^5*(a + b*x)^4) + (B*d)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d
^2)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3)/(4*b*(b*c - a*d)^3*g^5*(a
 + b*x)) + (B*d^4*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(a
+ b*x))/(c + d*x)])/(4*b*g^5*(a + b*x)^4) - (B*d^4*Log[c + d*x])/(4*b*(b*c
- a*d)^4*g^5)
```

Rubi [A] time = 0.156583, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}+\frac{}{12bg^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] -B/(16*b*g^5*(a + b*x)^4) + (B*d)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d
^2)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3)/(4*b*(b*c - a*d)^3*g^5*(a
 + b*x)) + (B*d^4*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(a
+ b*x))/(c + d*x)])/(4*b*g^5*(a + b*x)^4) - (B*d^4*Log[c + d*x])/(4*b*(b*c
- a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(ag+bgx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4bg^5(a+bx)^4}+\frac{B\int \frac{bc-ad}{g^4(a+bx)^5(c+dx)}\,dx}{4bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int \frac{1}{(a+bx)^5(c+dx)}\,dx}{4bg^5}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int \left(\frac{b}{(bc-ad)(a+bx)^5}-\frac{bd}{(bc-ad)^2(a+bx)^4}+\frac{bd^2}{(bc-ad)^3(a+bx)^3}-\frac{bd^3}{(bc-ad)^4(}\right.}{4bg^5}$$

$$= -\frac{B}{16bg^5(a+bx)^4}+\frac{Bd}{12b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2}{8b(bc-ad)^2g^5(a+bx)^2}+\frac{Bd^3}{4b(bc-ad)^3g^5(a+}$$

Mathematica [A] time = 0.228634, size = 158, normalized size = 0.77

$$\frac{\frac{B\left(\frac{12d^3(bc-ad)}{a+bx}-\frac{6d^2(bc-ad)^2}{(a+bx)^2}+\frac{4d(bc-ad)^3}{(a+bx)^3}-\frac{3(bc-ad)^4}{(a+bx)^4}+12d^4\log(a+bx)-12d^4\log(c+dx)\right)}{12(bc-ad)^4}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{(a+bx)^4}}{4bg^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(a + b*x)^4) + (B*((-3*(b*c - a*d)^
4)/(a + b*x)^4 + (4*d*(b*c - a*d)^3)/(a + b*x)^3 - (6*d^2*(b*c - a*d)^2)/(a
 + b*x)^2 + (12*d^3*(b*c - a*d))/(a + b*x) + 12*d^4*Log[a + b*x] - 12*d^4*L
og[c + d*x]))/(12*(b*c - a*d)^4))/(4*b*g^5)
```

Maple [B] time = 0.051, size = 1607, normalized size = 7.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x)
```

```
[Out] e*d^4/(a*d-b*c)^5/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d^3/(a*d-b*
c)^5/g^5*A/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-3/2*e^2*d^3/(a*d-b*c)^5/
g^5*A*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+3/2*e^2*d^2/(a*d-b*c)^5/g^5
*A*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+e^3*d^2/(a*d-b*c)^5/g^5*A*b^
2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-e^3*d/(a*d-b*c)^5/g^5*A*b^3/(b*e/
d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/4*e^4*d/(a*d-b*c)^5/g^5*A*b^3/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/4*e^4/(a*d-b*c)^5/g^5*A*b^4/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^4*c+e*d^4/(a*d-b*c)^5/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(
d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e*d^3/(a*d-b*c)^5/g^5*B/(b*e/
d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+e*d^4/(a
*d-b*c)^5/g^5*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d^3/(a*d-b*c)^5/g^5
*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-3/2*e^2*d^3/(a*d-b*c)^5/g^5*B*b/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3/2
*e^2*d^2/(a*d-b*c)^5/g^5*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*c-3/4*e^2*d^3/(a*d-b*c)^5/g^5*B*b/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)^2*a+3/4*e^2*d^2/(a*d-b*c)^5/g^5*B*b^2/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)^2*c+e^3*d^2/(a*d-b*c)^5/g^5*B*b^2/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^3*d/(a*d-b*c)^5/g^5*B*
b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
+1/3*e^3*d^2/(a*d-b*c)^5/g^5*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-
1/3*e^3*d/(a*d-b*c)^5/g^5*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/4
*e^4*d/(a*d-b*c)^5/g^5*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))*a+1/4*e^4/(a*d-b*c)^5/g^5*B*b^4/(b*e/d+e/(d*x+c)*a-
e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/16*e^4*d/(a*d-b*c)^5
/g^5*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/16*e^4/(a*d-b*c)^5/g^5
*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c
```

Maxima [B] time = 1.39642, size = 873, normalized size = 4.24

$$\frac{1}{48}B\left(\frac{12\,b^3d^3x^3 - 3\,b^3c^3 + 13\,ab^2c^2d - 23\,a^2bcd^2 + 25\,a^3}{\left(b^8c^3 - 3\,ab^7c^2d + 3\,a^2b^6cd^2 - a^3b^5d^3\right)g^5x^4 + 4\left(ab^7c^3 - 3\,a^2b^6c^2d + 3\,a^3b^5cd^2 - a^4b^4d^3\right)g^5x^3 + 6\left(a^2b^6c^3 - 3\,a^3b^5\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="maxima")
```

```
[Out] 1/48*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*
a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)
*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*
g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)
*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3
)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5
) - 12*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((
b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*
g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 +
 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 1.07202, size = 1284, normalized size = 6.23

$$-\frac{3\,(4\,A+B)b^4c^4-16\,(3\,A+B)ab^3c^3d+36\,(2\,A+B)a^2b^2c^2d^2-48\,(A+B)a^3bcd^3+(12\,A+25\,B)a^4d^4-12\left(Bb^4cd^3-B\right.}{48\left(\left(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\right)g^5x^4+4\left(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6c^2d^2-4\,a^4\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="fricas")
```

```
[Out] -1/48*(3*(4*A + B)*b^4*c^4 - 16*(3*A + B)*a*b^3*c^3*d + 36*(2*A + B)*a^2*b^
2*c^2*d^2 - 48*(A + B)*a^3*b*c*d^3 + (12*A + 25*B)*a^4*d^4 - 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 12*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*
B*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3
*b*c*d^3)*log((b*e*x + a*e)/(d*x + c)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b
^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*
b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*
(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*
b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4
*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^
6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

Sympy [B] time = 11.107, size = 944, normalized size = 4.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(a + b*x)/(c + d*x))/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x + 24*a**
2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) - B*d**4*log(x +
 (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10*B*a**
3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4 -
 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a*d - b
*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) + B*d**4*log(x
 + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 10*B*a*
*3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4
+ 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(a*d -
b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) - (12*A*a**3*
d**3 - 36*A*a**2*b*c*d**2 + 36*A*a*b**2*c**2*d - 12*A*b**3*c**3 + 25*B*a**3
*d**3 - 23*B*a**2*b*c*d**2 + 13*B*a*b**2*c**2*d - 3*B*b**3*c**3 + 12*B*b**3
*d**3*x**3 + x**2*(42*B*a*b**2*d**3 - 6*B*b**3*c*d**2) + x*(52*B*a**2*b*d**
3 - 20*B*a*b**2*c*d**2 + 4*B*b**3*c**2*d))/(48*a**7*b*d**3*g**5 - 144*a**6*
b**2*c*d**2*g**5 + 144*a**5*b**3*c**2*d*g**5 - 48*a**4*b**4*c**3*g**5 + x**
4*(48*a**3*b**5*d**3*g**5 - 144*a**2*b**6*c*d**2*g**5 + 144*a*b**7*c**2*d*g
**5 - 48*b**8*c**3*g**5) + x**3*(192*a**4*b**4*d**3*g**5 - 576*a**3*b**5*c*
d**2*g**5 + 576*a**2*b**6*c**2*d*g**5 - 192*a*b**7*c**3*g**5) + x**2*(288*a
**5*b**3*d**3*g**5 - 864*a**4*b**4*c*d**2*g**5 + 864*a**3*b**5*c**2*d*g**5
- 288*a**2*b**6*c**3*g**5) + x*(192*a**6*b**2*d**3*g**5 - 576*a**5*b**3*c*d
**2*g**5 + 576*a**4*b**4*c**2*d*g**5 - 192*a**3*b**5*c**3*g**5))
```

Giac [B] time = 1.37798, size = 967, normalized size = 4.69

$$\frac{Bd^4\log\left(bx+a\right)}{4\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+a^4bd^4g^5\right)}-\frac{Bd^4\log\left(dx+c\right)}{4\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] 1/4*B*d^4*log(b*x + a)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2
*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) - 1/4*B*d^4*log(d*x + c)/(b^5*c
^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^5 +
a^4*b*d^4*g^5) - 1/4*B*log((b*x + a)/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*
x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 1/48*(12*B*b^3*d^3
*x^3 - 6*B*b^3*c*d^2*x^2 + 42*B*a*b^2*d^3*x^2 + 4*B*b^3*c^2*d*x - 20*B*a*b^
2*c*d^2*x + 52*B*a^2*b*d^3*x - 12*A*b^3*c^3 - 15*B*b^3*c^3 + 36*A*a*b^2*c^2
*d + 49*B*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 59*B*a^2*b*c*d^2 + 12*A*a^3*d^3
+ 37*B*a^3*d^3)/(b^8*c^3*g^5*x^4 - 3*a*b^7*c^2*d*g^5*x^4 + 3*a^2*b^6*c*d^2*
g^5*x^4 - a^3*b^5*d^3*g^5*x^4 + 4*a*b^7*c^3*g^5*x^3 - 12*a^2*b^6*c^2*d*g^5*
x^3 + 12*a^3*b^5*c*d^2*g^5*x^3 - 4*a^4*b^4*d^3*g^5*x^3 + 6*a^2*b^6*c^3*g^5*
x^2 - 18*a^3*b^5*c^2*d*g^5*x^2 + 18*a^4*b^4*c*d^2*g^5*x^2 - 6*a^5*b^3*d^3*g
^5*x^2 + 4*a^3*b^5*c^3*g^5*x - 12*a^4*b^4*c^2*d*g^5*x + 12*a^5*b^3*c*d^2*g^
5*x - 4*a^6*b^2*d^3*g^5*x + a^4*b^4*c^3*g^5 - 3*a^5*b^3*c^2*d*g^5 + 3*a^6*b
^2*c*d^2*g^5 - a^7*b*d^3*g^5)
```

3.97 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=365

$$\frac{2B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{5bd^5}+\frac{Bg^4(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(12B\log\left(\frac{e(a+bx)}{c+dx}\right)+12A+25B\right)}{30bd^5}+\frac{Bg^4(a+bx)(bc-}{}$$

```
[Out] -(B*(b*c - a*d)*g^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b
*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b) + (B*(
b*c - a*d)^2*g^4*(a + b*x)^3*(4*A + B + 4*B*Log[(e*(a + b*x))/(c + d*x)]))/
(30*b*d^2) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2*(12*A + 7*B + 12*B*Log[(e*(a
+ b*x))/(c + d*x)]))/(60*b*d^3) + (B*(b*c - a*d)^4*g^4*(a + b*x)*(12*A + 13
*B + 12*B*Log[(e*(a + b*x))/(c + d*x)]))/(30*b*d^4) + (B*(b*c - a*d)^5*g^4*
Log[(b*c - a*d)/(b*(c + d*x))]*(12*A + 25*B + 12*B*Log[(e*(a + b*x))/(c + d
*x)]))/(30*b*d^5) + (2*B^2*(b*c - a*d)^5*g^4*PolyLog[2, (d*(a + b*x))/(b*(c
 + d*x))])/(5*b*d^5)
```

Rubi [A] time = 0.854539, antiderivative size = 557, normalized size of antiderivative = 1.53, number of steps used = 28, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}-\frac{2Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{5bd^5}-\frac{Bg^4(a+bx)^2(bc-ad)^3\left(B\log\right.}{5bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (13*B^2*(b*c - a*d)^4*g^4*x)/(30*d^4)
 - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^
4*(a + b*x)^3)/(30*b*d^2) + (2*B^2*(b*c - a*d)^4*g^4*(a + b*x)*Log[(e*(a +
b*x))/(c + d*x)])/(5*b*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]))/(5*b*d^3) + (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(A
 + B*Log[(e*(a + b*x))/(c + d*x)]))/(15*b*d^2) - (B*(b*c - a*d)*g^4*(a + b*
x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(10*b*d) + (g^4*(a + b*x)^5*(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2)/(5*b) - (5*B^2*(b*c - a*d)^5*g^4*Log[c
+ d*x])/(6*b*d^5) + (2*B^2*(b*c - a*d)^5*g^4*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(5*b*d^5) - (2*B*(b*c - a*d)^5*g^4*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x])/(5*b*d^5) - (B^2*(b*c - a*d)^5*g^4*Log[c + d*x
```

```
]^2)/(5*b*d^5) + (2*B^2*(b*c - a*d)^5*g^4*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])/(5*b*d^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{(2B)\int \frac{(bc-ad)g^5(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx} d}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int \frac{(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{c+dx}}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3\left(A+B\log\left(\frac{e}{}\right.\right.}{d^4}\right.}{}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int (a+bx)^3\left(A+B\log\right.}{5d}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} - \frac{B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5bd^3} + \frac{2B(bc}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{2B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{5bd^4} - \frac{B(bc-ad)^3g^4}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{2B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{5bd^4} - \frac{B(bc-ad)^3g^4}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \frac{B^2(}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \frac{B^2(}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \frac{B^2(}{}$$

$$= \frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \frac{B^2(}{}$$

Mathematica [A] time = 0.497888, size = 511, normalized size = 1.4

$$g^4\left(\frac{B(bc-ad)\left(12B(bc-ad)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-12d^2(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)+8d^3(a+bx)^3(bc-ad)\left(B\log\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(b*c - a*d)*(
24*A*b*d*(b*c - a*d)^3*x + 24*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c
+ d*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)
]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 24*B*(b*c - a
*d)^4*Log[c + d*x] - 24*(b*c - a*d)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*
Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2
*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2
*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d
*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*(b*c
 - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12*d^5)))/(5*b)
```

Maple [F] time = 2.536, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{4} \left(A + B\ln\left(\frac{e\,(bx + a)}{dx + c}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.83175, size = 3225, normalized size = 8.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b -
```

c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)
) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*
a^3*b*g^4 + 2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x +
a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 1/3*(6*x^4*log(b*e*x/(d*x + c) + a
*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c
*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^
3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/30*(12*x^5*log(b*e*x/(d*x + c) + a*e/(d*
x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3
- a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*
b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 + A^2*a^4*g^4
x - 1/30((12*g^4*log(e) + 25*g^4)*b^4*c^5 - (60*g^4*log(e) + 113*g^4)*a*b
^3*c^4*d + 4*(30*g^4*log(e) + 49*g^4)*a^2*b^2*c^3*d^2 - 12*(10*g^4*log(e) +
13*g^4)*a^3*b*c^2*d^3 + 12*(5*g^4*log(e) + 4*g^4)*a^4*c*d^4)*B^2*log(d*x +
c)/d^5 - 2/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 1
0*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x + a)*log(
(b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*
d^5) + 1/60*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 - 6*(b^5*c*d^4*g^4*log(e) - (1
0*g^4*log(e)^2 + g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 2*((4*g^4*log(e) + g^4)*b
^5*c^2*d^3 - 2*(10*g^4*log(e) + g^4)*a*b^4*c*d^4 + (60*g^4*log(e)^2 + 16*g^
4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 - ((12*g^4*log(e) + 7*g^4)*b^5*c^3*d^2
- 3*(20*g^4*log(e) + 9*g^4)*a*b^4*c^2*d^3 + 3*(40*g^4*log(e) + 11*g^4)*a^2
*b^3*c*d^4 - (120*g^4*log(e)^2 + 72*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^2*x
^2 + 2*((12*g^4*log(e) + 13*g^4)*b^5*c^4*d - (60*g^4*log(e) + 59*g^4)*a*b^4
*c^3*d^2 + 6*(20*g^4*log(e) + 17*g^4)*a^2*b^3*c^2*d^3 - (120*g^4*log(e) + 7
9*g^4)*a^3*b^2*c*d^4 + (30*g^4*log(e)^2 + 48*g^4*log(e) + 23*g^4)*a^4*b*d^5
)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^
3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x + B^2*a^
5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 10*
a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 + 2*(12*B^2*b^
5*d^5*g^4*x^5*log(e) - 3*(b^5*c*d^4*g^4 - (20*g^4*log(e) + g^4)*a*b^4*d^5)*
B^2*x^4 + 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + 2*(15*g^4*log(e) + 2*g^4
)*a^2*b^3*d^5)*B^2*x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*
b^3*c*d^4*g^4 - 2*(10*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^
4*d*g^4 - 5*a*b^4*c^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g
^4 + (5*g^4*log(e) + 4*g^4)*a^4*b*d^5)*B^2*x + (12*a*b^4*c^4*d*g^4 - 54*a^2
*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 + (12*g^4*lo
g(e) + 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) - 2*(12*B^2*b^5*d^5*g^4*x^5*log(e
) - 3*(b^5*c*d^4*g^4 - (20*g^4*log(e) + g^4)*a*b^4*d^5)*B^2*x^4 + 4*(b^5*c^
2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + 2*(15*g^4*log(e) + 2*g^4)*a^2*b^3*d^5)*B^2*
x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 - 2*(
10*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 12*(b^5*c^4*d*g^4 - 5*a*b^4*c
^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g^4 + (5*g^4*log(e)

```
+ 4*g^4)*a^4*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \left(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2a^2b^2g^4x^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((b*e*x + a*e)/(d
*x + c))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x
^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^4 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")

[Out] integrate((b*g*x + a*g)^4*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.98 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=309

$$-\frac{B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{2bd^4}-\frac{Bg^3(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)}{c+dx}\right)+6A+11B\right)}{12bd^4}-\frac{Bg^3(a+bx)(bc-ad}{}$$

```
[Out] -(B*(b*c - a*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b*
d) + (g^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) + (B*(b
*c - a*d)^2*g^3*(a + b*x)^2*(3*A + B + 3*B*Log[(e*(a + b*x))/(c + d*x)]))/(
12*b*d^2) - (B*(b*c - a*d)^3*g^3*(a + b*x)*(6*A + 5*B + 6*B*Log[(e*(a + b*x
))/(c + d*x)]))/(12*b*d^3) - (B*(b*c - a*d)^4*g^3*Log[(b*c - a*d)/(b*(c + d
*x))]*(6*A + 11*B + 6*B*Log[(e*(a + b*x))/(c + d*x)]))/(12*b*d^4) - (B^2*(b
*c - a*d)^4*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b*d^4)
```

Rubi [A] time = 0.64583, antiderivative size = 474, normalized size of antiderivative = 1.53, number of steps used = 24, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bd^4}+\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bd^4}+\frac{Bg^3(a+bx)^2(bc-ad)^2\left(B\log\right.}{4bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (5*B^2*(b*c - a*d)^3*g^3*x)/(12*d^3) +
 (B^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/(12*b*d^2) - (B^2*(b*c - a*d)^3*g^3*(a
 + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(2*b*d^3) + (B*(b*c - a*d)^2*g^3*(a +
 b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b*d^2) - (B*(b*c - a*d)*g^
3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b*d) + (g^3*(a + b*x
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b) + (11*B^2*(b*c - a*d)^4*g
^3*Log[c + d*x])/(12*b*d^4) - (B^2*(b*c - a*d)^4*g^3*Log[-((d*(a + b*x))/(b
*c - a*d))]*Log[c + d*x])/(2*b*d^4) + (B*(b*c - a*d)^4*g^3*(A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[c + d*x])/(2*b*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[c
 + d*x]^2)/(4*b*d^4) - (B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/(2*b*d^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b}-\frac{B\int\frac{(bc-ad)g^4(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}dx}{2bg}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b}-\frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}}{2b}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b}-\frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2\left(A+B\log\left(\frac{e(a+b}{c+d}\right.\right.}{d^3}\right.}{}$$

$$=\frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4b}-\frac{\left(B(bc-ad)g^3\right)\int(a+bx)^2\left(A+B\log\right.}{2d}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}+\frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4bd^2}-\frac{B(bc-}{}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}-\frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bd^3}+\frac{B(bc-ad)^2g^3(}{}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}-\frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{2bd^3}+\frac{B(bc-ad)^2g^3(}{}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}-\frac{5B^2(bc-ad)^3g^3x}{12d^3}+\frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2}-\frac{B^2(bc}{}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}-\frac{5B^2(bc-ad)^3g^3x}{12d^3}+\frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2}-\frac{B^2(bc}{}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}-\frac{5B^2(bc-ad)^3g^3x}{12d^3}+\frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2}-\frac{B^2(bc}{}$$

$$=-\frac{AB(bc-ad)^3g^3x}{2d^3}-\frac{5B^2(bc-ad)^3g^3x}{12d^3}+\frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2}-\frac{B^2(bc}{}$$

Mathematica [A] time = 0.33544, size = 391, normalized size = 1.27

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2-\frac{B(bc-ad)\left(3B(bc-ad)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2d^3(a+bx)^3\left(B\log\left(\frac{e(a+b}{c+d}\right.\right.\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(
6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b*x))/(
c + d*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c +
d*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 6*B*(b*c
- a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)*Log[c + d*x] + B*(b*c - a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(
b*c - a*d)^2*Log[c + d*x]) + 3*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[
c + d*x]) + 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
 + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4))
)/(4*b)
```

Maple [F] time = 2.177, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{3} \left(A + B\ln\left(\frac{e\left(bx + a\right)}{dx + c}\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.75332, size = 2338, normalized size = 7.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B
*a^3*g^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b
^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3 + (2*x^3*log
(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
+ c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A
```

```
*B*a*b^2*g^3 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*
g^3 + A^2*a^3*g^3*x + 1/12*((6*g^3*log(e) + 11*g^3)*b^3*c^4 - 2*(12*g^3*log
(e) + 19*g^3)*a*b^2*c^3*d + 9*(4*g^3*log(e) + 5*g^3)*a^2*b*c^2*d^2 - 6*(4*g
^3*log(e) + 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 1/2*(b^4*c^4*g^3 - 4*a
*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d^4*g^3)*(
log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
 - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 - 2*(b^4*c*d^3
*g^3*log(e) - (6*g^3*log(e)^2 + g^3*log(e))*a*b^3*d^4)*B^2*x^3 + ((3*g^3*lo
g(e) + g^3)*b^4*c^2*d^2 - 2*(6*g^3*log(e) + g^3)*a*b^3*c*d^3 + (18*g^3*log(
e)^2 + 9*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 - ((6*g^3*log(e) + 5*g^3)*b
^4*c^3*d - (24*g^3*log(e) + 17*g^3)*a*b^3*c^2*d^2 + (36*g^3*log(e) + 19*g^3
)*a^2*b^2*c*d^3 - (12*g^3*log(e)^2 + 18*g^3*log(e) + 7*g^3)*a^3*b*d^4)*B^2*
x + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a)^2 + 3*(B^2*b^
4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2
*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3
 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) -
 2*(b^4*c*d^3*g^3 - (12*g^3*log(e) + g^3)*a*b^3*d^4)*B^2*x^3 + 3*(b^4*c^2*d
^2*g^3 - 4*a*b^3*c*d^3*g^3 + 3*(4*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 -
6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 - (4*g^3*log(e
) + 3*g^3)*a^3*b*d^4)*B^2*x - (6*a*b^3*c^3*d*g^3 - 21*a^2*b^2*c^2*d^2*g^3 +
 26*a^3*b*c*d^3*g^3 - (6*g^3*log(e) + 11*g^3)*a^4*d^4)*B^2)*log(b*x + a) -
(6*B^2*b^4*d^4*g^3*x^4*log(e) - 2*(b^4*c*d^3*g^3 - (12*g^3*log(e) + g^3)*a*
b^3*d^4)*B^2*x^3 + 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 + 3*(4*g^3*log(e)
 + g^3)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a
^2*b^2*c*d^3*g^3 - (4*g^3*log(e) + 3*g^3)*a^3*b*d^4)*B^2*x + 6*(B^2*b^4*d^4
*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*
b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c))/(b*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\frac{bex}{dx}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
```

```
3*g^3)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^
3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.99 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=253

$$\frac{2B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}+\frac{Bg^2(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(\frac{e(a+bx)}{c+dx}\right)+2A+3B\right)}{3bd^3}+\frac{Bg^2(a+bx)(bc-ad)^2}{}$$

```
[Out] -(B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*
d) + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b) + (B*(b
*c - a*d)^2*g^2*(a + b*x)*(2*A + B + 2*B*Log[(e*(a + b*x))/(c + d*x)]))/(3*
b*d^2) + (B*(b*c - a*d)^3*g^2*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B + 2
*B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*Poly
Log[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b*d^3)
```

Rubi [A] time = 0.552817, antiderivative size = 389, normalized size of antiderivative = 1.54, number of steps used = 20, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}-\frac{2Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bd^3}+\frac{2ABg^2x(bc-ad)^2}{3d^2}-\frac{Bg^2(a+}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) + (
2*B^2*(b*c - a*d)^2*g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*b*d^2) -
 (B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*
d) + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*b) - (B^2*
(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*Log[-((d
*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (2*B*(b*c - a*d)^3*g^2*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*b*d^3) - (B^2*(b*c -
a*d)^3*g^2*Log[c + d*x]^2)/(3*b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*PolyLog[2,
(b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b} - \frac{(2B)\int\frac{(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\frac{(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)\left(A+B\log\left(\right.\right.}{d^2}\right.}{}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int(a+bx)\left(A+B\log\right.}{3d}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} - \frac{B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3bd} + \frac{g^2(a}{}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bd^2} - \frac{B(bc-ad)g}{}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{3bd^2} - \frac{B(bc-ad)g}{}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+}{c+}\right.}{3bd^2}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+}{c+}\right.}{3bd^2}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+}{c+}\right.}{3bd^2}$$

$$= \frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} + \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+}{c+}\right.}{3bd^2}$$

Mathematica [A] time = 0.220747, size = 287, normalized size = 1.13

$$\frac{g^2\left(\frac{B(bc-ad)\left(B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.\right.}{d^3}\right.}{3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(b*c - a*d)*(
2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x))/(c +
d*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*(b*c - a
*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*L
og[c + d*x] + B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + B*(b*c
- a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(3*b)
```

Maple [F] time = 1.991, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2 \left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 2.03334, size = 1573, normalized size = 6.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x
 + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2
- (b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(
d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 + A^2*a^2*g^2
*x - 1/3*((2*g^2*log(e) + 3*g^2)*b^2*c^3 - (6*g^2*log(e) + 7*g^2)*a*b*c^2*d
 + 2*(3*g^2*log(e) + 2*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*
g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x + a)*lo
```

```
g((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(
b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 - (b^3*c*d^2*g^2*log(e) - (3*g^2
*log(e)^2 + g^2*log(e))*a*b^2*d^3)*B^2*x^2 + ((2*g^2*log(e) + g^2)*b^3*c^2*
d - 2*(3*g^2*log(e) + g^2)*a*b^2*c*d^2 + (3*g^2*log(e)^2 + 4*g^2*log(e) + g
^2)*a^2*b*d^3)*B^2*x + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B
^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + (B^2*b^3*d^3*g^2*x^3
 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^3*c^3*g^2 - 3*a*b^2
*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 + (2*B^2*b^3*d^3*g^2*x^
3*log(e) - (b^3*c*d^2*g^2 - (6*g^2*log(e) + g^2)*a*b^2*d^3)*B^2*x^2 + 2*(b^
3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 + (3*g^2*log(e) + 2*g^2)*a^2*b*d^3)*B^2*x +
 (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 + (2*g^2*log(e) + 3*g^2)*a^3*d^3)*B
^2)*log(b*x + a) - (2*B^2*b^3*d^3*g^2*x^3*log(e) - (b^3*c*d^2*g^2 - (6*g^2*
log(e) + g^2)*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 + (
3*g^2*log(e) + 2*g^2)*a^2*b*d^3)*B^2*x + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b
^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a))*log
(d*x + c))/(b*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2\left(ABb^2g^2x^2 + 2\,AB\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*b
^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((b*e*x + a*e)/(d*x + c)), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.100 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=180

$$-\frac{B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}-\frac{Bg(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A+B\right)}{bd^2}-\frac{Bg(a+bx)(bc-ad)\left(B\log\right.}{bd}$$

```
[Out] -((B*(b*c - a*d)*g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*d)) +
 (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*b) - (B*(b*c - a
*d)^2*g*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B + B*Log[(e*(a + b*x))/(c + d*
x)]))/(b*d^2) - (B^2*(b*c - a*d)^2*g*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(b*d^2)
```

Rubi [A] time = 0.455556, antiderivative size = 285, normalized size of antiderivative = 1.58, number of steps used = 16, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}+\frac{Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*x)/d) - (B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x))
/(c + d*x)])/(b*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(2*b) + (B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) - (B^2*(b*c - a*d)^2*g*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^2) + (B*(b*c - a*d)^2*
g*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*d^2) + (B^2*(b*c -
a*d)^2*g*Log[c + d*x]^2)/(2*b*d^2) - (B^2*(b*c - a*d)^2*g*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/(b*d^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (agx+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{B\int \frac{(bc-ad)g^2(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}dx}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int \frac{(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{c+dx}dx}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{d} + \frac{(-bc}{}\right.}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{d}$$

$$= -\frac{AB(bc-ad)gx}{d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2b} + \frac{B(bc-ad)^2g\left(A+B\right.}{}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx)^2\left(A+B\log\right.}{2b}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx)^2\left(A+B\log\right.}{2b}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx)^2\left(A+B\log\right.}{2b}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx)^2\left(A+B\log\right.}{2b}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx)^2\left(A+B\log\right.}{2b}$$

$$= -\frac{AB(bc-ad)gx}{d} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{bd} + \frac{g(a+bx)^2\left(A+B\log\right.}{2b}$$

<u>Mathematica</u> [A] time = 0.17703, size = 203, normalized size = 1.13

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B(bc-ad)\left(B(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e}{}\right.\right.\right.}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(b*c - a*d)*(2*
A*b*d*x + 2*B*d*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] - 2*B*(b*c - a*d)*Lo
g[c + d*x] - 2*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x
] + B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^2))/(2*b)
```

Maple [F] time = 1.642, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)\left(A + B\ln\left(\frac{e\,(bx + a)}{dx + c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.54517, size = 825, normalized size = 4.58

$$\frac{1}{2}\,A^2bgx^2 + 2\left(x\log\left(\frac{bex}{dx + c} + \frac{ae}{dx + c}\right) + \frac{a\log\left(bx + a\right)}{b} - \frac{c\log\left(dx + c\right)}{d}\right)ABag + \left(x^2\log\left(\frac{bex}{dx + c} + \frac{ae}{dx + c}\right) - \frac{a^2\log\left(b\right.}{b^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a
)/b - c*log(d*x + c)/d)*A*B*a*g + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))
 - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*b
*g + A^2*a*g*x + ((g*log(e) + g)*b*c^2 - (2*g*log(e) + g)*a*c*d)*B^2*log(d*
x + c)/d^2 + (b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b*x + a)*log((b*d*x
 + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^2) +
 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 - 2*(b^2*c*d*g*log(e) - (g*log(e)^2 + g*lo
g(e))*a*b*d^2)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2
*g)*log(b*x + a)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x - (b^2*c^2*g -
2*a*b*c*d*g)*B^2)*log(d*x + c)^2 + 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(
```

```
e) + g)*a*b*d^2 - b^2*c*d*g)*B^2*x + ((g*log(e) + g)*a^2*d^2 - a*b*c*d*g)*B
^2)*log(b*x + a) - 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(e) + g)*a*b*d^2
- b^2*c*d*g)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g
)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{bex + ae}{dx + c}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(d*x
 + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)\left(B\log\left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.101 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=128

$$\frac{2B\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg}+\frac{2B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{bg}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{bg}$$

```
[Out] -(((A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - (b*(c + d*x))/(d*(a + b*x
))])/(b*g)) + (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2, (b*(c +
d*x))/(d*(a + b*x))])/(b*g) + (2*B^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))
])/(b*g)
```

Rubi [B] time = 3.41603, antiderivative size = 728, normalized size of antiderivative = 5.69, number of steps used = 46, number of rules used = 23, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.719, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396}

$$\frac{2AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}-\frac{2B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(a+bx)}{c+dx}\right)+\log(a+bx)+\log\left(\frac{1}{c+dx}\right)\right)}{bg}-\frac{2B^2\text{PolyLog}(3,\ldots}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x),x]
```

```
[Out] -((A*B*Log[g*(a + b*x)]^2)/(b*g)) + (B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (B^2
*Log[a + b*x]^2*Log[-c - d*x])/(b*g) + (2*B^2*Log[a + b*x]*Log[g*(a + b*x)]
*Log[-c - d*x])/(b*g) - (B^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b*g) + (B^2
*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-1)]^2)/(b*g) - (B^2*Log[
g*(a + b*x)]*Log[(c + d*x)^(-1)]^2)/(b*g) + (B^2*Log[a + b*x]^2*Log[(b*(c +
 d*x))/(b*c - a*d)])/(b*g) + (B^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c
 - a*d)])/(b*g) + ((A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[a*g + b*g*x])
/(b*g) + (2*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b*g) - (2
*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*Lo
g[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/(b*g) - (B^2*Log[(e*(a + b*x
))/(c + d*x)]*Log[a*g + b*g*x]^2)/(b*g) - (B^2*Log[(b*(c + d*x))/(b*c - a*d
)]*Log[a*g + b*g*x]^2)/(b*g) + (2*A*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d
))])/(b*g) + (2*B^2*Log[a + b*x]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(b*g) - (2*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c +
```

```
 d*x)])*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*Log[(c + d
*x)^(-1)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) - (2*B^2*PolyLog[3,
-((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*PolyLog[3, (b*(c + d*x))/(b*c
 - a*d)])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
```

```
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx}{e(a+bx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx}{a+bx}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int\left(\frac{d\left(-A-B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{(bc-ad)(c+dx)} + \frac{b\left(A\right.}{}\right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{(2Bd)\int \frac{\left(-A\right.}{}}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int\left(\frac{A\log(ag+bgx)}{a+bx} + \frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)\log(ag+bgx)}{a+bx}\right)dx}{g} -$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2AB)\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{\left(2B^2\right)\int \frac{\log\left(\frac{e(a+bx)}{c+dx}\right)\log(ag+b}{a+bx}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} + \frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{B^2\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(ag+bgx)}{bg} + \frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{2B^2\left(\log(a+b\right.}{}$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{2B^2\log(a+bx)\log(g(a+bx))\log(-c-dx)}{bg} - \frac{B^2\log(g(a+bx))\,\mathrm{l}}{bg}$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{2B^2\log(a+bx)\log(g(a+bx))\log(-c-dx)}{bg} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\mathrm{l}}{bg}$$

$$= -\frac{AB\log^2(g(a+bx))}{bg} + \frac{B^2\log^3(g(a+bx))}{3bg} - \frac{B^2\log^2(a+bx)\log(-c-dx)}{bg} + \frac{2B^2\log(a+}{}$$

Mathematica [A] time = 0.604136, size = 250, normalized size = 1.95

$$\frac{-2AB\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+2B^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)+2B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)+A^2\log(a+bx)+2AB}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x),x]
```

```
[Out] (A*B*Log[a/b + x]^2 + A^2*Log[a + b*x] - 2*A*B*Log[a/b + x]*Log[a + b*x] +
2*A*B*Log[c/d + x]*Log[a + b*x] - 2*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(-(b
*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(a + b*x))/(c + d*x)] - B^2*Log[(-(
b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x))/(c + d*x)]^2 - 2*A*B*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)] + 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2
, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x
))])/(b*g)
```

Maple [B] time = 0.069, size = 1186, normalized size = 9.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x)
```

```
[Out] d/g/(a*d-b*c)*A^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-1/g/(a*d-b*c)*A^2*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-d/g/(a*d-b*c)*A^2/b*ln(d*(b*e/d+(a*d-b*c)*e/
d/(d*x+c))-b*e)*a+1/g/(a*d-b*c)*A^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
*c+1/3*d/g/(a*d-b*c)*B^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*a-1/3/g/(a*d-b
*c)*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^3*c-d/g/(a*d-b*c)*B^2/b*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+1/g/(a
*d-b*c)*B^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*e/d+(a*d-b*c)
*e/d/(d*x+c)))*c-2*d/g/(a*d-b*c)*B^2/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*poly
log(2,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+2/g/(a*d-b*c)*B^2*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*polylog(2,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*c+2*
d/g/(a*d-b*c)*B^2/b*polylog(3,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a-2/g/
(a*d-b*c)*B^2*polylog(3,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*c+d/g/(a*d-b
*c)*A*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/g/(a*d-b*c)*A*B*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))^2*c-2*d/g/(a*d-b*c)*A*B/b*dilog(-(d*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))-b*e)/b/e)*a+2/g/(a*d-b*c)*A*B*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d
*x+c))-b*e)/b/e)*c-2*d/g/(a*d-b*c)*A*B/b*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln
```

```
(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a+2/g/(a*d-b*c)*A*B*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{B^2\log(bx+a)\log(dx+c)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2\,ABbc\log(e)+\left(B^2bdx+B^2bc\right)\log(bx+a)^2+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - integr
ate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log(b*x +
 a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) - 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x + (2*B^2*b*d*x + (b*c + a*d)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g), x)
```

3.102 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=126

$$-\frac{2B(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}-\frac{2B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] (-2*B^2*(c + d*x))/((b*c - a*d)*g^2*(a + b*x)) - (2*B*(c + d*x)*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)*g^2*(a + b*x)) - ((c + d*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)*g^2*(a + b*x))
```

Rubi [C] time = 0.771787, antiderivative size = 470, normalized size of antiderivative = 3.73, number of steps used = 26, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{2B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{2Bd\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg^2(bc-ad)}-\frac{2B\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+\right.}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-2*B^2)/(b*g^2*(a + b*x)) - (2*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) - (2*B*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(b*g^2*(a + b*x)) - (2*B*d*Log[a + b*x]*(A + B*Log[(e*(a + b*x)
)/(c + d*x)]))/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2
/(b*g^2*(a + b*x)) + (2*B^2*d*Log[c + d*x])/(b*(b*c - a*d)*g^2) - (2*B^2*d*
Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)*g^2) + (2*B*
d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*(b*c - a*d)*g^2) +
(B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (2*B^2*d*Log[a + b*x]*Log[(b*(
c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) - (2*B^2*d*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (2*B^2*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)} + \frac{d^2\left(A+\cdots\right.}{(bc\cdots}\cdots\right.}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(2Bd)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{(bc-ad)g^2} + \frac{(2Bd^2\cdots}{\cdots}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\cdots\right.\right.}{bg^2(a+bx)}\cdots$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\cdots\right.\right.}{bg^2(a+bx)}\cdots$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\cdots\right.\right.}{bg^2(a+bx)}\cdots$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\,\mathrm{l}\cdots\right.}{b(bc-ad)g^2\cdots}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\log(a+bx)\left(A+B\,\mathrm{l}\cdots\right.}{b(bc-ad)g^2\cdots}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\cdots}{\cdots}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bg^2(a+bx)} - \frac{2Bd\cdots}{\cdots}$$

Mathematica [C] time = 0.473057, size = 314, normalized size = 2.49

$$-\frac{B\left(-Bd(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(a+bx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2(bc\cdots\right.}{b\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)*(A + B*Log[(e
*(a + b*x))/(c + d*x)]) + 2*d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]) - 2*d*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c +
 d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x
]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a + b*x)*((2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

Maple [B] time = 0.049, size = 828, normalized size = 6.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] e*d/(a*d-b*c)^2/g^2*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e/(a*d-b*c)^2
/g^2*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+2*e*d/(a*d-b*c)^2/g^2*A*B/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e/(
a*d-b*c)^2/g^2*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*b*c+2*e*d/(a*d-b*c)^2/g^2*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)*a-2*e/(a*d-b*c)^2/g^2*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+e*d/(a
*d-b*c)^2/g^2*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))^2*a-e/(a*d-b*c)^2/g^2*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+2*e*d/(a*d-b*c)^2/g^2*B^2/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e/(a*d-b*c)^2/g^
2*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b
*c+2*e*d/(a*d-b*c)^2/g^2*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-2*e/(a*d
-b*c)^2/g^2*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c
```

Maxima [B] time = 1.28542, size = 562, normalized size = 4.46

$$-\left(2\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}-\frac{d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{\left(bdx+ad\right)\log\left(bx+a\right)^2+\left(bdx+ad\right)\log\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="maxima
")
```

```
[Out] -(2*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log
(d*x + c)/((b^2*c - a*b*d)*g^2))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - ((b
*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d -
 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a)
)*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))*
B^2 - 2*A*B*(log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^2*g^2*x + a*b*g^2) + 1
/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(d*x +
 c)/((b^2*c - a*b*d)*g^2)) - B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^
2*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.02027, size = 319, normalized size = 2.53

$$-\frac{\left(A^2+2\,AB+2\,B^2\right)bc-\left(A^2+2\,AB+2\,B^2\right)ad+\left(B^2bdx+B^2bc\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left(\left(AB+B^2\right)bdx+\left(AB+B^2\right)bc\right)\log}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="fricas
")
```

```
[Out] -((A^2 + 2*A*B + 2*B^2)*b*c - (A^2 + 2*A*B + 2*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((b*e*x + a*e)/(d*x + c))^2 + 2*((A*B + B^2)*b*d*x + (A*B + B^2)*b*
c)*log((b*e*x + a*e)/(d*x + c)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*
b*d)*g^2)
```

Sympy [B] time = 4.3354, size = 432, normalized size = 3.43

$$-\frac{2Bd\,(A+B)\log\left(x+\frac{2ABad^2+2ABbcd+2B^2ad^2+2B^2bcd-\frac{2Ba^2d^3(A+B)}{ad-bc}+\frac{4Babcd^2(A+B)}{ad-bc}-\frac{2Bb^2c^2d(A+B)}{ad-bc}}{4ABbd^2+4B^2bd^2}\right)}{bg^2\,(ad-bc)}+\frac{2Bd\,(A+B)\log\left(x+\frac{2ABad^2+2AB}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] -2*B*d*(A + B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d + 2*B**2*a*d**2 + 2*B**2
*b*c*d - 2*B*a**2*d**3*(A + B)/(a*d - b*c) + 4*B*a*b*c*d**2*(A + B)/(a*d -
b*c) - 2*B*b**2*c**2*d*(A + B)/(a*d - b*c))/(4*A*B*b*d**2 + 4*B**2*b*d**2))
/(b*g**2*(a*d - b*c)) + 2*B*d*(A + B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d +
 2*B**2*a*d**2 + 2*B**2*b*c*d + 2*B*a**2*d**3*(A + B)/(a*d - b*c) - 4*B*a*b
*c*d**2*(A + B)/(a*d - b*c) + 2*B*b**2*c**2*d*(A + B)/(a*d - b*c))/(4*A*B*b
*d**2 + 4*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B - 2*B**2)*log(e*(a +
 b*x)/(c + d*x))/(a*b*g**2 + b**2*g**2*x) + (B**2*c + B**2*d*x)*log(e*(a +
b*x)/(c + d*x))**2/(a**2*d*g**2 - a*b*c*g**2 + a*b*d*g**2*x - b**2*c*g**2*x
) - (A**2 + 2*A*B + 2*B**2)/(a*b*g**2 + b**2*g**2*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^2, x)
```

3.103 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=268

$$-\frac{bB(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)^2}+\frac{2Bd(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g^3(a+bx)(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+dx)}{g^3(}$$

```
[Out] (2*B^2*d*(c + d*x))/((b*c - a*d)^2*g^3*(a + b*x)) - (b*B^2*(c + d*x)^2)/(4*
(b*c - a*d)^2*g^3*(a + b*x)^2) + (2*B*d*(c + d*x)*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/((b*c - a*d)^2*g^3*(a + b*x)) - (b*B*(c + d*x)^2*(A + B*Log[(e
*(a + b*x))/(c + d*x)]))/(2*(b*c - a*d)^2*g^3*(a + b*x)^2) + (d*(c + d*x)*(
A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^2*g^3*(a + b*x)) - (b*(
c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*(b*c - a*d)^2*g^3*(a
+ b*x)^2)
```

Rubi [C] time = 0.90955, antiderivative size = 577, normalized size of antiderivative = 2.15, number of steps used = 30, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)\left(B\,\mathrm{lo}\right.}{bg^3(bc-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -B^2/(4*b*g^3*(a + b*x)^2) + (3*B^2*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (3
*B^2*d^2*Log[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (B^2*d^2*Log[a + b*x]^2)/(
2*b*(b*c - a*d)^2*g^3) - (B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b*g^3*
(a + b*x)^2) + (B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b*(b*c - a*d)*g^
3*(a + b*x)) + (B*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b
*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(2*b*g^3*(a +
b*x)^2) - (3*B^2*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3) + (B^2*d^2*Log[-
((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) - (B*d^2*(
A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) - (
B^2*d^2*Log[c + d*x]^2)/(2*b*(b*c - a*d)^2*g^3) + (B^2*d^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*PolyLog[2, (b
```

```
*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)^2} + \frac{bd^2\left(A+B\ldots\right.}{(bc-a\ldots}\right.}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{(bc-ad)^2g^3} - \frac{\left(Bd^3\right)\int \ldots}{b(bc\ldots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{Bd^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right.\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \ldots$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bg^3(a+bx)^2} + \ldots$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+bx)}{2b(bc-ad)^2g^3} - \frac{B\left(A\ldots\right.}{\ldots}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+bx)}{2b(bc-ad)^2g^3} - \frac{B\left(A\ldots\right.}{\ldots}$$

Mathematica [C] time = 0.516738, size = 443, normalized size = 1.65

$$-\frac{B\left(2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-2Bd^2(a+bx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-4\ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -(2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*(b*c - a*d)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(a
+ b*x))/(c + d*x)]) - 4*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x
))/(c + d*x)]) + 4*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a +
b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^
2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*d^2*(a +
 b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a + b*x)^2*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*b*g^3*(a + b*x)^2)
```

Maple [B] time = 0.049, size = 1715, normalized size = 6.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] e*d^2/(a*d-b*c)^3/g^3*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-e*d/(a*d-b*
c)^3/g^3*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-1/2*e^2*d/(a*d-b*c)^3/
g^3*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/2*e^2/(a*d-b*c)^3/g^3*A
^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2*e*d^2/(a*d-b*c)^3/g^3*A*B/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e*d
/(a*d-b*c)^3/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)
*e/d/(d*x+c))*b*c+2*e*d^2/(a*d-b*c)^3/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)*a-2*e*d/(a*d-b*c)^3/g^3*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-
e^2*d/(a*d-b*c)^3/g^3*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+
(a*d-b*c)*e/d/(d*x+c))*a+e^2/(a*d-b*c)^3/g^3*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d
/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/2*e^2*d/(a*d-b*c)^3/g^3
*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+1/2*e^2/(a*d-b*c)^3/g^3*A*B*
b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+e*d^2/(a*d-b*c)^3/g^3*B^2/(b*e/
d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-e*d/(a*d
-b*c)^3/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2*b*c+2*e*d^2/(a*d-b*c)^3/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b
*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e*d/(a*d-b*c)^3/g^3*B^2/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+2*e*d^2/(a*d-b
```

```
*c)^3/g^3*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-2*e*d/(a*d-b*c)^3/g^3*B
^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-1/2*e^2*d/(a*d-b*c)^3/g^3*B^2*b/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+1
/2*e^2/(a*d-b*c)^3/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))^2*c-1/2*e^2*d/(a*d-b*c)^3/g^3*B^2*b/(b*e/d+e/(d*x
+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+1/2*e^2/(a*d-b*c
)^3/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*c-1/4*e^2*d/(a*d-b*c)^3/g^3*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)
*b*c)^2*a+1/4*e^2/(a*d-b*c)^3/g^3*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*
c)^2*c
```

Maxima [B] time = 1.46657, size = 1145, normalized size = 4.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="maxima
")
```

```
[Out] 1/4*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a
^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2
 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c
*d + a^2*b*d^2)*g^3))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - (b^2*c^2 - 8*a
*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2
 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*
b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*
d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)
*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d
^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c
^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 + 1/2*A*B*((2*b*d*x -
 b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x +
(a^2*b^2*c - a^3*b*d)*g^3) - 2*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^3*g^
3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2
*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b
*d^2)*g^3)) - 1/2*B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^3*g^3*x^2 +
 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*
g^3)
```

Fricas [A] time = 1.0926, size = 767, normalized size = 2.86

$$-\frac{\left(2A^2+2AB+B^2\right)b^2c^2-4\left(A^2+2AB+2B^2\right)abcd+\left(2A^2+6AB+7B^2\right)a^2d^2-2\left(B^2b^2d^2x^2+2B^2abd^2x-B^2b^2c^2\right.}{4\left(\left(b^5c^2-2ab^4c\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*((2*A^2 + 2*A*B + B^2)*b^2*c^2 - 4*(A^2 + 2*A*B + 2*B^2)*a*b*c*d + (2*
A^2 + 6*A*B + 7*B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b
^2*c^2 + 2*B^2*a*b*c*d)*log((b*e*x + a*e)/(d*x + c))^2 - 2*((2*A*B + 3*B^2)
*b^2*c*d - (2*A*B + 3*B^2)*a*b*d^2)*x - 2*((2*A*B + 3*B^2)*b^2*d^2*x^2 - (2
*A*B + B^2)*b^2*c^2 + 4*(A*B + B^2)*a*b*c*d + 2*(B^2*b^2*c*d + 2*(A*B + B^2
)*a*b*d^2)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b
^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*
b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 7.64257, size = 892, normalized size = 3.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] -B*d**2*(2*A + 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 + 3*B**2*a*d**3
+ 3*B**2*b*c*d**2 - B*a**3*d**5*(2*A + 3*B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d
**4*(2*A + 3*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3*(2*A + 3*B)/(a*d - b*
c)**2 + B*b**3*c**3*d**2*(2*A + 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 + 6*B**2
*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + B*d**2*(2*A + 3*B)*log(x + (2*A*B*a*d
**3 + 2*A*B*b*c*d**2 + 3*B**2*a*d**3 + 3*B**2*b*c*d**2 + B*a**3*d**5*(2*A +
 3*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4*(2*A + 3*B)/(a*d - b*c)**2 + 3*B*a
*b**2*c**2*d**3*(2*A + 3*B)/(a*d - b*c)**2 - B*b**3*c**3*d**2*(2*A + 3*B)/(
a*d - b*c)**2)/(4*A*B*b*d**3 + 6*B**2*b*d**3))/(2*b*g**3*(a*d - b*c)**2) +
(2*B**2*a*c*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(a
+ b*x)/(c + d*x))**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*
g**3*x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*
g**3*x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**
```

```
3*x**2) + (-2*A*B*a*d + 2*A*B*b*c - 3*B**2*a*d + B**2*b*c - 2*B**2*b*d*x)*l
og(e*(a + b*x)/(c + d*x))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + 4*a**2*b*
*2*d*g**3*x - 4*a*b**3*c*g**3*x + 2*a*b**3*d*g**3*x**2 - 2*b**4*c*g**3*x**2
) - (2*A**2*a*d - 2*A**2*b*c + 6*A*B*a*d - 2*A*B*b*c + 7*B**2*a*d - B**2*b*
c + x*(4*A*B*b*d + 6*B**2*b*d))/(4*a**3*b*d*g**3 - 4*a**2*b**2*c*g**3 + x**
2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 - 8*a*b**3*c*g*
*3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^3, x)
```

3.104 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=418

$$-\frac{b^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^3}-\frac{2b^2B(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{d^2(c+dx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^4(a+bx)(bc-ad)^3}-\frac{2Bd^2(c}{}$$

```
[Out] (-2*B^2*d^2*(c + d*x))/((b*c - a*d)^3*g^4*(a + b*x)) + (b*B^2*d*(c + d*x)^2
)/(2*(b*c - a*d)^3*g^4*(a + b*x)^2) - (2*b^2*B^2*(c + d*x)^3)/(27*(b*c - a*
d)^3*g^4*(a + b*x)^3) - (2*B*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/((b*c - a*d)^3*g^4*(a + b*x)) + (b*B*d*(c + d*x)^2*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]))/((b*c - a*d)^3*g^4*(a + b*x)^2) - (2*b^2*B*(c + d*x)^3*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*(b*c - a*d)^3*g^4*(a + b*x)^3) - (
d^2*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^3*g^4*(a
 + b*x)) + (b*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c -
 a*d)^3*g^4*(a + b*x)^2) - (b^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/(3*(b*c - a*d)^3*g^4*(a + b*x)^3)
```

Rubi [C] time = 1.05899, antiderivative size = 680, normalized size of antiderivative = 1.63, number of steps used = 34, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(c+d}{3bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B^2)/(27*b*g^4*(a + b*x)^3) + (5*B^2*d)/(18*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (11*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (11*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)^3
*g^4) - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(9*b*g^4*(a + b*x)^3) +
(B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*(b*c - a*d)*g^4*(a + b*x)^2
) - (2*B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*(b*c - a*d)^2*g^4*(
a + b*x)) - (2*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*
b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(3*b*g^4*(a +
 b*x)^3) + (11*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*L
```

```
og[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (2
*B*d^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*b*(b*c - a*d)^
3*g^4) + (B^2*d^3*Log[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d
^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b*(b*c - a*d)^3*g^4) - (2*B
^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)^3} + \frac{bd^2\left(A+\right.}{(bc-}\right.}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^4}\,dx}{3g^4} - \frac{\left(2Bd^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{3(bc-ad)^3g^4} + \frac{\left(2Bd^4\right.}{}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9bg^4(a+bx)^3} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{2Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} - \frac{2Bd}{}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9bg^4(a+bx)^3} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{2Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} - \frac{2Bd}{}$$

$$= -\frac{2B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{9bg^4(a+bx)^3} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{2Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} - \frac{2Bd}{}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+b}{9b(bc-ad)^3g^4}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+b}{9b(bc-ad)^3g^4}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+b}{9b(bc-ad)^3g^4}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+b}{9b(bc-ad)^3g^4}$$

Mathematica [C] time = 0.766238, size = 585, normalized size = 1.4

$$-\frac{B\left(-18Bd^3(a+bx)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18Bd^3(a+bx)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -(18*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(12*(b*c - a*d)^3*(A + B*L
og[(e*(a + b*x))/(c + d*x)]) - 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(
a + b*x))/(c + d*x)]) + 36*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b
*x))/(c + d*x)]) + 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))
/(c + d*x)]) - 36*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[
c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(
a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d
)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*
x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d
)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c +
d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d^3*
(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d
*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^3)/(54*b*g^4*(
a + b*x)^3)
```

Maple [B] time = 0.05, size = 2624, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x)
```

```
[Out] -2*e*d^2/(a*d-b*c)^4/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*b*c+2*e*d^3/(a*d-b*c)^4/g^4*A*B/(b*e/d+e/(d*x+c)*a-e/
d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^2*d^2/(a*d-b*c)^4/g^4*A*
B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+e^2*d/(a*d-b*c)^4/g^4*A*B*b^2/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2/9*e^3*d/(a*d-b*c)^4/g^4*A*B*b^2/(b
*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2*e*d^2/(a*d-b*c)^4/g^4*A*B/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+e*d^3/(a*d-b*c)^4/g^4*A^2/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)*a+2*e*d^3/(a*d-b*c)^4/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)*a-2/27*e^3/(a*d-b*c)^4/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*
b*c)^3*c+e^2*d/(a*d-b*c)^4/g^4*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^
2*c+1/3*e^3*d/(a*d-b*c)^4/g^4*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3
*a-2/9*e^3/(a*d-b*c)^4/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/3*e^3/(a*d-b*c)^4/g^4*A^2*b^3/(b*e/d+e/(d
*x+c)*a-e/d/(d*x+c)*b*c)^3*c+2*e^2*d/(a*d-b*c)^4/g^4*A*B*b^2/(b*e/d+e/(d*x+
```

```
c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+2/3*e^3*d/(a*d-b*
c)^4/g^4*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))*a-2*e^2*d^2/(a*d-b*c)^4/g^4*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c
)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e*d^2/(a*d-b*c)^4/g^4*A^2/(b*e/d
+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-2/9*e^3/(a*d-b*c)^4/g^4*A*B*b^3/(b*e/d+e/
(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+2*e*d^3/(a*d-b*c)^4/g^4*B^2/(b*e/d+e/(d*x+c)
*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+e*d^3/(a*d-b*c)^4/g^4
*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*
a-1/3*e^3/(a*d-b*c)^4/g^4*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+1/2*e^2*d/(a*d-b*c)^4/g^4*B^2*b^2/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2/27*e^3*d/(a*d-b*c)^4/g^4*B^2*b^2/(b*e/d+e
/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a+2*e*d^3/(a*d-b*c)^4/g^4*A*B/(b*e/d+e/(d*x+c
)*a-e/d/(d*x+c)*b*c)*a-1/2*e^2*d^2/(a*d-b*c)^4/g^4*B^2*b/(b*e/d+e/(d*x+c)*a
-e/d/(d*x+c)*b*c)^2*a-e*d^2/(a*d-b*c)^4/g^4*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x
+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c+e^2*d/(a*d-b*c)^4/g^4*B^2*b^
2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c
-e^2*d^2/(a*d-b*c)^4/g^4*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e
/d+(a*d-b*c)*e/d/(d*x+c))*a+e^2*d/(a*d-b*c)^4/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*
a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+1/3*e^3*d/(a*d-b*c)^
4/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))^2*a+2/9*e^3*d/(a*d-b*c)^4/g^4*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+
c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e^2*d^2/(a*d-b*c)^4/g^4*B^2*b/(
b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-2/
3*e^3/(a*d-b*c)^4/g^4*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d^2/(a*d-b*c)^4/g^4*B^2/(b*e/d+e/(d*x+c)*a-e
/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-2*e*d^2/(a*d-b*c)^4/g^4
*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-e^2*d^2/(a*d-b*c)^4/g^4*A^2*b/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a
```

Maxima [B]   time = 1.85789, size = 1916, normalized size = 4.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="maxima
")
```

```
[Out] -1/54*(6*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
 - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c
^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d
 + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d
```

```
^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^
4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b
*d^3)*g^4))*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + (4*b^3*c^3 - 27*a*b^2*c^
2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b
^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 -
 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*
b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 3
3*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^
3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g
^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g
^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*
b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*
x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*
b^2*d^3*g^4)*x))*B^2 - 1/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11
*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2
)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^
4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
 a^5*b*d^2)*g^4) + 6*log(b*e*x/(d*x + c) + a*e/(d*x + c))/(b^4*g^4*x^3 + 3*
a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3
 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/(
(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*log
(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*
b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2
*g^4*x + a^3*b*g^4)
```

Fricas [A] time = 1.10476, size = 1388, normalized size = 3.32

$$-\frac{2\left(9A^2+6AB+2B^2\right)b^3c^3-27\left(2A^2+2AB+B^2\right)ab^2c^2d+54\left(A^2+2AB+2B^2\right)a^2bcd^2-\left(18A^2+66AB+85B^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="fricas
")
```

```
[Out] -1/54*(2*(9*A^2 + 6*A*B + 2*B^2)*b^3*c^3 - 27*(2*A^2 + 2*A*B + B^2)*a*b^2*c
^2*d + 54*(A^2 + 2*A*B + 2*B^2)*a^2*b*c*d^2 - (18*A^2 + 66*A*B + 85*B^2)*a^
3*d^3 + 6*((6*A*B + 11*B^2)*b^3*c*d^2 - (6*A*B + 11*B^2)*a*b^2*d^3)*x^2 + 1
8*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3
- 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((b*e*x + a*e)/(d*x + c))^2 - 3
```

```
*((6*A*B + 5*B^2)*b^3*c^2*d - 18*(2*A*B + 3*B^2)*a*b^2*c*d^2 + (30*A*B + 49
*B^2)*a^2*b*d^3)*x + 6*((6*A*B + 11*B^2)*b^3*d^3*x^3 + 2*(3*A*B + B^2)*b^3*
c^3 - 9*(2*A*B + B^2)*a*b^2*c^2*d + 18*(A*B + B^2)*a^2*b*c*d^2 + 3*(2*B^2*b
^3*c*d^2 + 3*(2*A*B + 3*B^2)*a*b^2*d^3)*x^2 - 3*(B^2*b^3*c^2*d - 6*B^2*a*b^
2*c*d^2 - 6*(A*B + B^2)*a^2*b*d^3)*x)*log((b*e*x + a*e)/(d*x + c)))/((b^7*c
^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3
- 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3
 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 -
3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

Sympy [B] time = 36.9113, size = 1544, normalized size = 3.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -B*d**3*(6*A + 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B*b*c*d**3 + 11*B**2*a*d**
4 + 11*B**2*b*c*d**3 - B*a**4*d**7*(6*A + 11*B)/(a*d - b*c)**3 + 4*B*a**3*b
*c*d**6*(6*A + 11*B)/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5*(6*A + 11*B)/
(a*d - b*c)**3 + 4*B*a*b**3*c**3*d**4*(6*A + 11*B)/(a*d - b*c)**3 - B*b**4*
c**4*d**3*(6*A + 11*B)/(a*d - b*c)**3)/(12*A*B*b*d**4 + 22*B**2*b*d**4))/(9
*b*g**4*(a*d - b*c)**3) + B*d**3*(6*A + 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B
*b*c*d**3 + 11*B**2*a*d**4 + 11*B**2*b*c*d**3 + B*a**4*d**7*(6*A + 11*B)/(a
*d - b*c)**3 - 4*B*a**3*b*c*d**6*(6*A + 11*B)/(a*d - b*c)**3 + 6*B*a**2*b**
2*c**2*d**5*(6*A + 11*B)/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4*(6*A + 11*B)
/(a*d - b*c)**3 + B*b**4*c**4*d**3*(6*A + 11*B)/(a*d - b*c)**3)/(12*A*B*b*d
**4 + 22*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3*B**2*a**2*c*d**2 + 3*
B**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**3*x**2 + B**2*b**2*c**
3 + B**2*b**2*d**3*x**3)*log(e*(a + b*x)/(c + d*x))**2/(3*a**6*d**3*g**4 -
9*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9*a**4*b**2*c**2*d*g**4 - 27*
a**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4*x**2 - 3*a**3*b**3*c**3*g**
4 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c*d**2*g**4*x**2 + 3*a**3*b**
3*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27*a**2*b**4*c**2*d*g**4*x**2
- 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*g**4*x**2 + 9*a*b**5*c**2*d*
g**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a**2*d**2 + 12*A*B*a*b*c*d - 6
*A*B*b**2*c**2 - 11*B**2*a**2*d**2 + 7*B**2*a*b*c*d - 15*B**2*a*b*d**2*x -
2*B**2*b**2*c**2 + 3*B**2*b**2*c*d*x - 6*B**2*b**2*d**2*x**2)*log(e*(a + b*
x)/(c + d*x))/(9*a**5*b*d**2*g**4 - 18*a**4*b**2*c*d*g**4 + 27*a**4*b**2*d*
*2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*a**3*b**3*c*d*g**4*x + 27*a**3*b**3*
d**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4*x - 54*a**2*b**4*c*d*g**4*x**2 + 9*
```

```
a**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c**2*g**4*x**2 - 18*a*b**5*c*d*g**4*x*
*3 + 9*b**6*c**2*g**4*x**3) - (18*A**2*a**2*d**2 - 36*A**2*a*b*c*d + 18*A**
2*b**2*c**2 + 66*A*B*a**2*d**2 - 42*A*B*a*b*c*d + 12*A*B*b**2*c**2 + 85*B**
2*a**2*d**2 - 23*B**2*a*b*c*d + 4*B**2*b**2*c**2 + x**2*(36*A*B*b**2*d**2 +
 66*B**2*b**2*d**2) + x*(90*A*B*a*b*d**2 - 18*A*B*b**2*c*d + 147*B**2*a*b*d
**2 - 15*B**2*b**2*c*d))/(54*a**5*b*d**2*g**4 - 108*a**4*b**2*c*d*g**4 + 54
*a**3*b**3*c**2*g**4 + x**3*(54*a**2*b**4*d**2*g**4 - 108*a*b**5*c*d*g**4 +
 54*b**6*c**2*g**4) + x**2*(162*a**3*b**3*d**2*g**4 - 324*a**2*b**4*c*d*g**
4 + 162*a*b**5*c**2*g**4) + x*(162*a**4*b**2*d**2*g**4 - 324*a**3*b**3*c*d*
g**4 + 162*a**2*b**4*c**2*g**4))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^4, x)
```

3.105 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=575

$$-\frac{b^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^4}-\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+dx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{g^5(a+bx)^3(bc-ad)^4}+\frac{2b^2Bd(}{3}$$

```
[Out] (2*B^2*d^3*(c + d*x))/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*B^2*d^2*(c + d*x
)^2)/(4*(b*c - a*d)^4*g^5*(a + b*x)^2) + (2*b^2*B^2*d*(c + d*x)^3)/(9*(b*c
- a*d)^4*g^5*(a + b*x)^3) - (b^3*B^2*(c + d*x)^4)/(32*(b*c - a*d)^4*g^5*(a
+ b*x)^4) + (2*B*d^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c
- a*d)^4*g^5*(a + b*x)) - (3*b*B*d^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(
c + d*x)]))/(2*(b*c - a*d)^4*g^5*(a + b*x)^2) + (2*b^2*B*d*(c + d*x)^3*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*c - a*d)^4*g^5*(a + b*x)^3) - (b^3*
B*(c + d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(8*(b*c - a*d)^4*g^5*(a
 + b*x)^4) + (d^3*(c + d*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*c -
 a*d)^4*g^5*(a + b*x)) - (3*b*d^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c +
 d*x)])^2)/(2*(b*c - a*d)^4*g^5*(a + b*x)^2) + (b^2*d*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)])^2)/((b*c - a*d)^4*g^5*(a + b*x)^3) - (b^3*(c +
d*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*(b*c - a*d)^4*g^5*(a + b*
x)^4)
```

Rubi [C] time = 1.22722, antiderivative size = 763, normalized size of antiderivative = 1.33, number of steps used = 38, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}+\frac{B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)\left(B\log\right.}{2bg^5(bc-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(32*b*g^5*(a + b*x)^4) + (7*B^2*d)/(72*b*(b*c - a*d)*g^5*(a + b*x)^3)
- (13*B^2*d^2)/(48*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(24*b*(b
*c - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(24*b*(b*c - a*d)^4*
g^5) - (B^2*d^4*Log[a + b*x]^2)/(4*b*(b*c - a*d)^4*g^5) - (B*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(8*b*g^5*(a + b*x)^4) + (B*d*(A + B*Log[(e*(a + b*x
```

```
))/(c + d*x)]))/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]))/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3*(A + B*L
og[(e*(a + b*x))/(c + d*x)]))/(2*b*(b*c - a*d)^3*g^5*(a + b*x)) + (B*d^4*Lo
g[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b*(b*c - a*d)^4*g^5) -
(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(4*b*g^5*(a + b*x)^4) - (25*B^2*d^4*
Log[c + d*x])/(24*b*(b*c - a*d)^4*g^5) + (B^2*d^4*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B*d^4*(A + B*Log[(e*(a +
b*x))/(c + d*x)])*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B^2*d^4*Log[c +
d*x]^2)/(4*b*(b*c - a*d)^4*g^5) + (B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5(c+dx)}\,dx}{2bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)^5} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)^2(a+bx)^4} + \frac{bd^2\left(A+\right.}{(bc-}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)^5}\,dx}{2g^5} + \frac{\left(Bd^4\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{2(bc-ad)^4g^5} - \frac{\left(Bd^5\right)\int}{2b(}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8bg^5(a+bx)^4} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2} + \frac{Bd^3}{2b(}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8bg^5(a+bx)^4} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2} + \frac{Bd^3}{2b(}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{8bg^5(a+bx)^4} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2} + \frac{Bd^3}{2b(}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2}{24b(bc-ad)}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2}{24b(bc-ad)}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2}{24b(bc-ad)}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2}{24b(bc-ad)}$$

Mathematica [C] time = 1.11006, size = 748, normalized size = 1.3

$$-\frac{B\left(72Bd^4(a+bx)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-72Bd^4(a+bx)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -(72*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(36*(b*c - a*d)^4*(A + B*L
og[(e*(a + b*x))/(c + d*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(
e*(a + b*x))/(c + d*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(
a + b*x))/(c + d*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(a
 + b*x))/(c + d*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(a +
b*x))/(c + d*x)]) + 144*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]
)*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d + d*(a + b*x)*Log[a + b*x
] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(
-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^
2*Log[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a +
 b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*
d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3
*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b
*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x])
+ 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b
*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 72*B*d^4*(a + b
*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^4)/(288*b*g^5*(a + b
*x)^4)
```

Maple [B] time = 0.049, size = 3538, normalized size = 6.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x)
```

```
[Out] e*d^4/(a*d-b*c)^5/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+1/4*e^4/(a*
d-b*c)^5/g^5*A^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+1/32*e^4/(a*d-
b*c)^5/g^5*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c+2*e*d^4/(a*d-b*c
)^5/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a+2*e*d^4/(a*d-b*c)^5/g^5*A
*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*a-1/2*e^4*d/(a*d-b*c)^5/g^5*A*B*b^3/
(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-e*d
^3/(a*d-b*c)^5/g^5*A^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+2/9*e^3*d^2/
(a*d-b*c)^5/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-2/9*e^3*d/(
a*d-b*c)^5/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/32*e^4*d/(
a*d-b*c)^5/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-3/2*e^2*d^3/
```

(a*d-b*c)^5/g^5*A^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+2*e*d^4/(a*d-b*c)^5/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3/2*e^2*d^2/(a*d-b*c)^5/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+e^3*d^2/(a*d-b*c)^5/g^5*A^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a-e^3*d/(a*d-b*c)^5/g^5*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c+3/4*e^2*d^2/(a*d-b*c)^5/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+1/8*e^4/(a*d-b*c)^5/g^5*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*c-1/4*e^4*d/(a*d-b*c)^5/g^5*A^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a+1/4*e^4/(a*d-b*c)^5/g^5*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c+1/8*e^4/(a*d-b*c)^5/g^5*B^2*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c+e*d^4/(a*d-b*c)^5/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a+2*e^3*d^2/(a*d-b*c)^5/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2*e*d^3/(a*d-b*c)^5/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c-2*e^3*d/(a*d-b*c)^5/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-3*e^2*d^3/(a*d-b*c)^5/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3*e^2*d^2/(a*d-b*c)^5/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-2*e*d^3/(a*d-b*c)^5/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c-3/4*e^2*d^3/(a*d-b*c)^5/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a-2/3*e^3*d/(a*d-b*c)^5/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*c-1/8*e^4*d/(a*d-b*c)^5/g^5*A*B*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*a-2*e*d^3/(a*d-b*c)^5/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*b*c+1/2*e^4/(a*d-b*c)^5/g^5*A*B*b^4/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-e*d^3/(a*d-b*c)^5/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*b*c-2*e*d^3/(a*d-b*c)^5/g^5*B^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b*c+2*e*d^4/(a*d-b*c)^5/g^5*A*B/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+3/2*e^2*d^2/(a*d-b*c)^5/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-3/2*e^2*d^3/(a*d-b*c)^5/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+2/3*e^3*d^2/(a*d-b*c)^5/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a-2/3*e^3*d/(a*d-b*c)^5/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c-1/4*e^4*d/(a*d-b*c)^5/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-1/8*e^4*d/(a*d-b*c)^5/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^4*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*a+e^3*d^2/(a*d-b*c)^5/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-e^3*d/(a*d-b*c)^5/g^5*B^2*b^3/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*c-3/2*e^2*d^3/(a*d-b*c)^5/g^5*B^2*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*a-3/2*e^2*d^3/(a*d-b*c)^5/g^5*A*B*b/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*a+3/2*e^2*d^2/(a*d-b*c)^5/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*c+2/3*e^3*d^2/(a*d-b*c)^5/g^5*A*B*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^3*a

```
+3/2*e^2*d^2/(a*d-b*c)^5/g^5*B^2*b^2/(b*e/d+e/(d*x+c)*a-e/d/(d*x+c)*b*c)^2*
ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
```

Maxima [B] time = 2.18354, size = 2866, normalized size = 4.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algorithm="maxima
")
```

```
[Out] 1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2
 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d
^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^
3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d
^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*
d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*
g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4
*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b*e*x/(
d*x + c) + a*e/(d*x + c)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d
^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(1
3*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)
^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
+ a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2
*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*
d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*
a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^
4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*
log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*
b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*
b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g
^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 + 1/24*A*B*((12*b^3*d^3*x^3 -
 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 -
7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^
```

```
3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 -
 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3
- 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3
 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 -
3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 12*log(b*e*x/(d*x + c
) + a*e/(d*x + c))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a
^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d +
 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c
)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d
^4)*g^5)) - 1/4*B^2*log(b*e*x/(d*x + c) + a*e/(d*x + c))^2/(b^5*g^5*x^4 + 4
*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^2
/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4
*b*g^5)
```

<u>Fricas</u> [A] time = 1.16413, size = 2152, normalized size = 3.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algorithm="fricas
")
```

```
[Out] -1/288*(9*(8*A^2 + 4*A*B + B^2)*b^4*c^4 - 32*(9*A^2 + 6*A*B + 2*B^2)*a*b^3*
c^3*d + 216*(2*A^2 + 2*A*B + B^2)*a^2*b^2*c^2*d^2 - 288*(A^2 + 2*A*B + 2*B^
2)*a^3*b*c*d^3 + (72*A^2 + 300*A*B + 415*B^2)*a^4*d^4 - 12*((12*A*B + 25*B^
2)*b^4*c*d^3 - (12*A*B + 25*B^2)*a*b^3*d^4)*x^3 + 6*((12*A*B + 13*B^2)*b^4*
c^2*d^2 - 16*(6*A*B + 11*B^2)*a*b^3*c*d^3 + (84*A*B + 163*B^2)*a^2*b^2*d^4)
*x^2 - 72*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 +
4*B^2*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2
 + 4*B^2*a^3*b*c*d^3)*log((b*e*x + a*e)/(d*x + c))^2 - 4*((12*A*B + 7*B^2)*
b^4*c^3*d - 12*(6*A*B + 5*B^2)*a*b^3*c^2*d^2 + 108*(2*A*B + 3*B^2)*a^2*b^2*
c*d^3 - (156*A*B + 271*B^2)*a^3*b*d^4)*x - 12*((12*A*B + 25*B^2)*b^4*d^4*x^
4 - 3*(4*A*B + B^2)*b^4*c^4 + 16*(3*A*B + B^2)*a*b^3*c^3*d - 36*(2*A*B + B^
2)*a^2*b^2*c^2*d^2 + 48*(A*B + B^2)*a^3*b*c*d^3 + 4*(3*B^2*b^4*c*d^3 + 2*(6
*A*B + 11*B^2)*a*b^3*d^4)*x^3 - 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 6*
(2*A*B + 3*B^2)*a^2*b^2*d^4)*x^2 + 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 +
 18*B^2*a^2*b^2*c*d^3 + 12*(A*B + B^2)*a^3*b*d^4)*x)*log((b*e*x + a*e)/(d*x
 + c)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a
^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 -
4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d +
 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^
```

```
4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^
5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3
+ a^8*b*d^4)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(bgx+ag\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(b*g*x + a*g)^5, x)
```

3.106 $\int \frac{\log\left(\frac{d(a+bx)}{b(c+dx)}\right)}{cf+dfx}\,dx$

Optimal. Leaf size=28

$$\frac{\text{PolyLog}\left(2,\frac{bc-ad}{b(c+dx)}\right)}{df}$$

```
[Out] PolyLog[2, (b*c - a*d)/(b*(c + d*x))]/(d*f)
```

Rubi [A] time = 0.0224578, antiderivative size = 29, normalized size of antiderivative = 1.04, number of steps used = 1, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.034, Rules used = {2447}

$$\frac{\text{PolyLog}\left(2,1-\frac{d(a+bx)}{b(c+dx)}\right)}{df}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(d*(a + b*x))/(b*(c + d*x))]/(c*f + d*f*x),x]
```

```
[Out] PolyLog[2, 1 - (d*(a + b*x))/(b*(c + d*x))]/(d*f)
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\log\left(\frac{d(a+bx)}{b(c+dx)}\right)}{cf+dfx}\,dx=\frac{\text{Li}_2\left(1-\frac{d(a+bx)}{b(c+dx)}\right)}{df}$$

Mathematica [B] time = 0.050042, size = 114, normalized size = 4.07

$$\frac{\log\left(\frac{bc-ad}{bc+bdx}\right)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-2\log\left(\frac{d(a+bx)}{b(c+dx)}\right)+\log\left(\frac{bc-ad}{bc+bdx}\right)\right)-2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2df}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(d*(a + b*x))/(b*(c + d*x))]/(c*f + d*f*x),x]
```

```
[Out] (Log[(b*c - a*d)/(b*c + b*d*x)]*(2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - 2*Lo
g[(d*(a + b*x))/(b*(c + d*x))] + Log[(b*c - a*d)/(b*c + b*d*x)]) - 2*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/(2*d*f)
```

Maple [A] time = 0.048, size = 30, normalized size = 1.1

$$\frac{1}{df}\text{dilog}\left(1+\frac{ad-bc}{b(dx+c)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x)
```

```
[Out] 1/d/f*dilog(1+(a*d-b*c)/b/(d*x+c))
```

Maxima [B] time = 1.23762, size = 213, normalized size = 7.61

$$-\frac{b\left(\frac{\log(dx+c)^2}{bf}-\frac{2\left(\log(bx+a)\log\left(\frac{bdx+ad}{bc-ad}+1\right)+\text{Li}_2\left(-\frac{bdx+ad}{bc-ad}\right)\right)}{bf}\right)}{2d}-\frac{b\left(\frac{d\log(bx+a)}{b}-\frac{d\log(dx+c)}{b}\right)\log\left(dfx+cf\right)}{d^2f}+\frac{\log\left(dfx+cf\right)\log\left(\frac{(bx+}{(dx+}\right.}{df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x, algorithm="maxima")
```

```
[Out] -1/2*b*(log(d*x + c)^2/(b*f) - 2*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d
) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))/(b*f))/d - b*(d*log(b*x + a)/b
- d*log(d*x + c)/b)*log(d*f*x + c*f)/(d^2*f) + log(d*f*x + c*f)*log((b*x +
```

```
a)*d/((d*x + c)*b))/(d*f)
```

Fricas [A] time = 0.974562, size = 63, normalized size = 2.25

$$\frac{\text{Li}_2\left(-\frac{bdx+ad}{bdx+bc}+1\right)}{df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x, algorithm="fricas")
```

```
[Out] dilog(-(b*d*x + a*d)/(b*d*x + b*c) + 1)/(d*f)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(\frac{(bx+a)d}{(dx+c)b}\right)}{dfx+cf}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(d*(b*x+a)/b/(d*x+c))/(d*f*x+c*f),x, algorithm="giac")
```

```
[Out] integrate(log((b*x + a)*d/((d*x + c)*b))/(d*f*x + c*f), x)
```

3.107 $\int \frac{\log\left(1+\frac{1}{a+bx}\right)}{a+bx}\,dx$

Optimal. Leaf size=15

$$\frac{\text{PolyLog}\left(2,-\frac{1}{a+bx}\right)}{b}$$

```
[Out] PolyLog[2, -(a + b*x)^(-1)]/b
```

Rubi [A] time = 0.0140898, antiderivative size = 15, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2447}

$$\frac{\text{PolyLog}\left(2,-\frac{1}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[Log[1 + (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] PolyLog[2, -(a + b*x)^(-1)]/b
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\log\left(1+\frac{1}{a+bx}\right)}{a+bx}\,dx=\frac{\text{Li}_2\left(-\frac{1}{a+bx}\right)}{b}$$

Mathematica [B] time = 0.0144037, size = 140, normalized size = 9.33

$$-\frac{\text{PolyLog}(2,-a-bx)}{b}+\frac{\log^2\left(\frac{ab-(a+1)b}{b(a+bx)}\right)}{2b}+\frac{\log\left(\frac{b(-a-bx-1)}{(-a-1)b+ab}\right)\log\left(\frac{ab-(a+1)b}{b(a+bx)}\right)}{b}-\frac{\log\left(\frac{a+bx+1}{a+bx}\right)\log\left(\frac{ab-(a+1)b}{b(a+bx)}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[1 + (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] (Log[(b*(-1 - a - b*x))/((-1 - a)*b + a*b)]*Log[(a*b - (1 + a)*b)/(b*(a + b
*x))])/b + Log[(a*b - (1 + a)*b)/(b*(a + b*x))]^2/(2*b) - (Log[(a*b - (1 +
a)*b)/(b*(a + b*x))]*Log[(1 + a + b*x)/(a + b*x)])/b - PolyLog[2, -a - b*x]
/b
```

Maple [A] time = 0.045, size = 15, normalized size = 1.

$$\frac{\operatorname{dilog}\left(1 + (bx + a)^{-1}\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(1+1/(b*x+a))/(b*x+a),x)
```

```
[Out] 1/b*dilog(1+1/(b*x+a))
```

Maxima [B] time = 1.21988, size = 82, normalized size = 5.47

$$\frac{2 \log(bx + a + 1) \log(bx + a) - \log(bx + a)^2}{2b} - \frac{\log(bx + a + 1) \log(bx + a) + \operatorname{Li}_2(-bx - a)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1+1/(b*x+a))/(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(2*log(b*x + a + 1)*log(b*x + a) - log(b*x + a)^2)/b - (log(b*x + a + 1
)*log(b*x + a) + dilog(-b*x - a))/b
```

Fricas [A] time = 0.952507, size = 53, normalized size = 3.53

$$\frac{\operatorname{Li}_2\left(-\frac{bx+a+1}{bx+a} + 1\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1+1/(b*x+a))/(b*x+a),x, algorithm="fricas")
```

```
[Out] dilog(-(b*x + a + 1)/(b*x + a) + 1)/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(1+\frac{1}{a+bx}\right)}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(1+1/(b*x+a))/(b*x+a),x)
```

```
[Out] Integral(log(1 + 1/(a + b*x))/(a + b*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(\frac{1}{bx+a}+1\right)}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1+1/(b*x+a))/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(log(1/(b*x + a) + 1)/(b*x + a), x)
```

3.108 $\int \frac{\log\left(1-\frac{1}{a+bx}\right)}{a+bx}\,dx$

Optimal. Leaf size=13

$$\frac{\text{PolyLog}\left(2,\frac{1}{a+bx}\right)}{b}$$

```
[Out] PolyLog[2, (a + b*x)^(-1)]/b
```

Rubi [A] time = 0.013087, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.05, Rules used = {2447}

$$\frac{\text{PolyLog}\left(2,\frac{1}{a+bx}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[Log[1 - (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] PolyLog[2, (a + b*x)^(-1)]/b
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\log\left(1-\frac{1}{a+bx}\right)}{a+bx}\,dx=\frac{\text{Li}_2\left(\frac{1}{a+bx}\right)}{b}$$

Mathematica [B] time = 0.0144664, size = 133, normalized size = 10.23

$$-\frac{\text{PolyLog}(2,a+bx)}{b}+\frac{\log^2\left(\frac{ab-(a-1)b}{b(a+bx)}\right)}{2b}+\frac{\log\left(\frac{b(a+bx-1)}{(a-1)b-ab}\right)\log\left(\frac{ab-(a-1)b}{b(a+bx)}\right)}{b}-\frac{\log\left(\frac{a+bx-1}{a+bx}\right)\log\left(\frac{ab-(a-1)b}{b(a+bx)}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[1 - (a + b*x)^(-1)]/(a + b*x),x]
```

```
[Out] (Log[(b*(-1 + a + b*x))/((-1 + a)*b - a*b)]*Log[(-((-1 + a)*b) + a*b)/(b*(a
 + b*x))])/b + Log[(-((-1 + a)*b) + a*b)/(b*(a + b*x))]^2/(2*b) - (Log[(-((
-1 + a)*b) + a*b)/(b*(a + b*x))]*Log[(-1 + a + b*x)/(a + b*x)])/b - PolyLog
[2, a + b*x]/b
```

Maple [A] time = 0.044, size = 17, normalized size = 1.3

$$\frac{1}{b}\mathrm{dilog}\left(1-(bx+a)^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(1-1/(b*x+a))/(b*x+a),x)
```

```
[Out] 1/b*dilog(1-1/(b*x+a))
```

Maxima [B] time = 1.08632, size = 80, normalized size = 6.15

$$-\frac{\log(bx+a)^2-2\,\log(bx+a)\log(bx+a-1)}{2\,b}-\frac{\log(bx+a)\log(-bx-a+1)+\mathrm{Li}_2(bx+a)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-1/(b*x+a))/(b*x+a),x, algorithm="maxima")
```

```
[Out] -1/2*(log(b*x + a)^2 - 2*log(b*x + a)*log(b*x + a - 1))/b - (log(b*x + a)*l
og(-b*x - a + 1) + dilog(b*x + a))/b
```

Fricas [A] time = 0.980251, size = 53, normalized size = 4.08

$$\frac{\mathrm{Li}_2\left(-\frac{bx+a-1}{bx+a}+1\right)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-1/(b*x+a))/(b*x+a),x, algorithm="fricas")
```

```
[Out] dilog(-(b*x + a - 1)/(b*x + a) + 1)/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(1-\frac{1}{a+bx}\right)}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(1-1/(b*x+a))/(b*x+a),x)
```

```
[Out] Integral(log(1 - 1/(a + b*x))/(a + b*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(-\frac{1}{bx+a}+1\right)}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(1-1/(b*x+a))/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(log(-1/(b*x + a) + 1)/(b*x + a), x)
```

3.109 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi [A] time = 0.20025, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x] + b^2*g^2*Defer[Int
][x^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+\left(b^2g^2\right)\int \frac{x^2}{A+B\log\left(\right.}\end{aligned}$$

Mathematica [A] time = 0.594204, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Maple [A] time = 1.126, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{2} \left(A + B\ln\left(\frac{e\left(bx + a\right)}{dx + c}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^{2}}{B\log\left(\frac{(bx+a)e}{dx+c}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^{2}g^{2}x^{2} + 2\,abg^{2}x + a^{2}g^{2}}{B\log\left(\frac{bex+ae}{dx+c}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((b*e*x + a*e)/(d*x +
c)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx+ag)^2}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

3.110 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=32

$$\text{Unintegrable}\left(\frac{ag+bgx}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi [A] time = 0.100646, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= (ag)\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.235532, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Maple [A] time = 0.961, size = 0, normalized size = 0.

$$\int (bgx + ag)\left(A + B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B\log\left(\frac{(bx+a)e}{dx+c}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bgx + ag}{B\log\left(\frac{bex+ae}{dx+c}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B\log\left(\frac{(bx+a)e}{dx+c}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

3.111 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi [A] time = 0.0718844, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]

[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.225396, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Maple [A] time = 1.183, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((b*e*x + a*e)/(d*x + c)
)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

3.112 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=50

$$\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{Bg^2(bc-ad)}$$

```
[Out] (e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)])/(B*(b*
c - a*d)*g^2)
```

Rubi [F] time = 0.0900594, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.102231, size = 52, normalized size = 1.04

$$\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{bBcg^2-aBdg^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] (e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)])/(b*B*c
*g^2 - a*B*d*g^2)
```

Maple [F] time = 1.187, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}} \left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

Fricas [A] time = 1.03048, size = 108, normalized size = 2.16

$$\frac{ee^{\frac{A}{B}}\,\text{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{A}{B}\right)}}{bex+ae}\right)}{(Bbc-Bad)g^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas
")
```

```
[Out] e*e^(A/B)*log_integral((d*x + c)*e^(-A/B)/(b*e*x + a*e))/((B*b*c - B*a*d)*g
^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

3.113 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=107

$$\frac{be^2e^{\frac{2A}{B}}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)}{Bg^3(bc-ad)^2}-\frac{dee^{A/B}\operatorname{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{Bg^3(bc-ad)^2}$$

```
[Out] (b*e^2*E^((2*A)/B)*ExpIntegralEi[(-2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/
B])/(B*(b*c - a*d)^2*g^3) - (d*e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a +
 b*x))/(c + d*x)])/B)])/(B*(b*c - a*d)^2*g^3)
```

Rubi [F] time = 0.0729636, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.165399, size = 89, normalized size = 0.83

$$\frac{ee^{A/B}\left(bee^{A/B}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)-d\operatorname{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)\right)}{Bg^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] (e*E^(A/B)*(b*e*E^(A/B)*ExpIntegralEi[(-2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/B] - d*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)]))/(B*(
b*c - a*d)^2*g^3)
```

Maple [F] time = 1.283, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

Fricas [A] time = 1.00978, size = 288, normalized size = 2.69

$$\frac{be^{2}e^{\left(\frac{2A}{B}\right)}\operatorname{log\_integral}\left(\frac{\left(d^{2}x^{2}+2\,cdx+c^{2}\right)e^{\left(-\frac{2A}{B}\right)}}{b^{2}e^{2}x^{2}+2\,abe^{2}x+a^{2}e^{2}}\right)-dee^{\frac{A}{B}}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{A}{B}\right)}}{bex+ae}\right)}{\left(Bb^{2}c^{2}-2\,Babcd+Ba^{2}d^{2}\right)g^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas
")
```

```
[Out] (b*e^2*e^(2*A/B)*log_integral((d^2*x^2 + 2*c*d*x + c^2)*e^(-2*A/B)/(b^2*e^2
*x^2 + 2*a*b*e^2*x + a^2*e^2)) - d*e*e^(A/B)*log_integral((d*x + c)*e^(-A/B
)/(b*e*x + a*e)))/((B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*d^2)*g^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

3.114 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi [A] time = 0.206123, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x] + b^2*g^2*Defer[I
nt][x^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+\left(b^2g^2\right)\int\end{aligned}$$

Mathematica [A] time = 1.32327, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Maple [A] time = 1.042, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^3dg^2x^4+a^3cg^2+\left(b^3cg^2+3\,ab^2dg^2\right)x^3+3\left(ab^2cg^2+a^2bdg^2\right)x^2+\left(3\,a^2bcg^2+a^3dg^2\right)x}{(bc-ad)B^2\log(bx+a)-(bc-ad)B^2\log(dx+c)+(bc-ad)AB+(bc\log(e)-ad\log(e))B^2}+\int\frac{4\,b^3dg^2x^3+3}{(bc-ad)B^2\log(bx+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] -(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^2*c*
g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/((b*c - a*d)*B^2*lo
g(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) -
 a*d*log(e))*B^2) + integrate((4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2 + a^3*d*g^2
+ 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*g^2)*x)/((b*
c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B
```

```
+ (b*c*log(e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,AB\log\left(\frac{bex+ae}{dx+c}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((b*e*x + a*e)/(d*x
+ c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x + c)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.115 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\text{Unintegrable}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi [A] time = 0.106785, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.912937, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Maple [A] time = 1.043, size = 0, normalized size = 0.

$$\int (bgx + ag)\left(A + B\ln\left(\frac{e(bx + a)}{dx + c}\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^2dgx^3 + a^2cg + \left(b^2cg + 2\,abdg\right)x^2 + \left(2\,abcg + a^2dg\right)x}{(bc - ad)B^2\log(bx + a) - (bc - ad)B^2\log(dx + c) + (bc - ad)AB + (bc\log(e) - ad\log(e))B^2} + \int \frac{}{(bc - ad)B^2\log(bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*d*g)
*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a
*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate((3*b^2*d*g*x^2 + 2*a*b
*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/((b*c - a*d)*B^2*log(b*x + a) -
 (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))
*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bgx + ag}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,AB\log\left(\frac{bex+ae}{dx+c}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e
*x + a*e)/(d*x + c)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.116 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi [A] time = 0.0808696, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]

[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.618128, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Maple [A] time = 1.042, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$d\int \frac{1}{\left(bcg-adg\right)B^2\log\left(bx+a\right)-\left(bcg-adg\right)B^2\log\left(dx+c\right)+\left(bcg-adg\right)AB+\left(bcg\log\left(e\right)-adg\log\left(e\right)\right)B^2}\,dx-\frac{}{\left(bcg-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima
")
```

```
[Out] d*integrate(1/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d
*x + c) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2), x) - (d
*x + c)/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d*x + c
) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{bex+ae}{dx+c}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b*e*x + a*e)/(
d*x + c))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

3.117 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=103

$$-\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{B^2g^2(bc-ad)}-\frac{c+dx}{Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}$$

```
[Out] -((e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)])/(B^2
*(b*c - a*d)*g^2)) - (c + d*x)/(B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(
a + b*x))/(c + d*x)]))
```

Rubi [F] time = 0.094921, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.187646, size = 87, normalized size = 0.84

$$\frac{ee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)+\frac{B(c+dx)}{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}}{B^2g^2(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] (e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)] + (B*(c
 + d*x))/((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])))/(B^2*(-(b*c) + a
*d)*g^2)
```

Maple [F] time = 1.274, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{dx+c}{\left(abcg^2-a^2dg^2\right)AB+\left(abcg^2\log\left(e\right)-a^2dg^2\log\left(e\right)\right)B^2+\left(\left(\left(b^2cg^2-abdg^2\right)AB+\left(b^2cg^2\log\left(e\right)-abdg^2\log\left(e\right)\right)B^2\right)x+\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxi
ma")
```

```
[Out] -(d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2*log
(e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2*log
(e))*B^2)*x + ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^2)
*log(b*x + a) - ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^
2)*log(d*x + c)) + integrate(-1/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2 + (B^2*b^
2*g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b*g^2)*x +
(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a) - (B^2*b^2*g
^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

Fricas [A] time = 1.02172, size = 423, normalized size = 4.11

$$-\frac{Bdx+Bc+\left((Bbex+Bae)e^{\frac{A}{B}}\log\left(\frac{bex+ae}{dx+c}\right)+(Abex+Aae)e^{\frac{A}{B}}\right)\mathrm{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{A}{B}\right)}}{bex+ae}\right)}{\left(AB^2b^2c-AB^2abd\right)g^2x+\left(AB^2abc-AB^2a^2d\right)g^2+\left(\left(B^3b^2c-B^3abd\right)g^2x+\left(B^3abc-B^3a^2d\right)g^2\right)\log\left(\frac{bex+ae}{dx+c}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fric
as")
```

```
[Out] -(B*d*x + B*c + ((B*b*e*x + B*a*e)*e^(A/B)*log((b*e*x + a*e)/(d*x + c)) + (
A*b*e*x + A*a*e)*e^(A/B))*log_integral((d*x + c)*e^(-A/B)/(b*e*x + a*e)))/(
(A*B^2*b^2*c - A*B^2*a*b*d)*g^2*x + (A*B^2*a*b*c - A*B^2*a^2*d)*g^2 + ((B^3
*b^2*c - B^3*a*b*d)*g^2*x + (B^3*a*b*c - B^3*a^2*d)*g^2)*log((b*e*x + a*e)/
(d*x + c)))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

3.118 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=212

$$-\frac{2be^2e^{\frac{2A}{B}}\operatorname{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)}{B^2g^3(bc-ad)^2}+\frac{dee^{A/B}\operatorname{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)}{B^2g^3(bc-ad)^2}-\frac{b(c+dx)^2}{Bg^3(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}+\frac{}{Bg^3(a+}$$

```
[Out] (-2*b*e^2*E^((2*A)/B)*ExpIntegralEi[(-2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/B])/(B^2*(b*c - a*d)^2*g^3) + (d*e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e
*(a + b*x))/(c + d*x)])/B)])/(B^2*(b*c - a*d)^2*g^3) + (d*(c + d*x))/(B*(b*
c - a*d)^2*g^3*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])) - (b*(c + d*
x)^2)/(B*(b*c - a*d)^2*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)
```

Rubi [F] time = 0.0837941, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.757335, size = 136, normalized size = 0.64

$$\frac{-2be^2e^{\frac{2A}{B}}\text{Ei}\left(-\frac{2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{B}\right)+dee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{B}\right)-\frac{B(c+dx)(bc-ad)}{(a+bx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}}{B^2g^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] (-2*b*e^2*E^((2*A)/B)*ExpIntegralEi[(-2*(A + B*Log[(e*(a + b*x))/(c + d*x)]
))/B] + d*e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x))/(c + d*x)])/B)
] - (B*(b*c - a*d)*(c + d*x))/((a + b*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*
x)])))/(B^2*(b*c - a*d)^2*g^3)
```

Maple [F] time = 1.43, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxi
ma")
```

```
[Out] -(d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d*g^3
*log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b^2*d
*g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g^3*l
```

```
og(e) - a^2*b*d*g^3*log(e))*B^2)*x + ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2
*(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(b*x
 + a) - ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*
B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate((b*d*x + 2
*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e) - a*b^3*d*g
^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*g^3*log(e) -
 a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B + (a*b^3*c*g^
3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 - a^3*b*d*g^3
)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x + ((b^4*c*g^3 -
a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2
*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*log(b*x + a) -
 ((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x
^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)
*log(d*x + c)), x)
```

Fricas [B] time = 1.1091, size = 1187, normalized size = 5.6

$$-\frac{Bbc^2 - Bacd + \left(Bbcd - Bad^2\right)x - \left(\left(Bb^2dex^2 + 2\,Babdex + Ba^2de\right)e^{\frac{A}{B}}\log\left(\frac{bex+ae}{dx+c}\right) + \left(Ab^2dex^2 + 2\,Aabdex + Aa^2de\right)e^{\frac{A}{B}}\right)\mathrm{l}}{\left(AB^2b^4c^2 - 2\,AB^2ab^3cd + AB^2a^2b^2d^2\right)g^3x^2 + 2\left(AB^2ab^3c^2 - 2\,AB^2a^2b^2cd + AB^2a^3bd^2\right)g^3x + \left(AB^2a^2b^2c^2 - 2\,AB^2a\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fric
as")
```

```
[Out] -(B*b*c^2 - B*a*c*d + (B*b*c*d - B*a*d^2)*x - ((B*b^2*d*e*x^2 + 2*B*a*b*d*e
*x + B*a^2*d*e)*e^(A/B)*log((b*e*x + a*e)/(d*x + c)) + (A*b^2*d*e*x^2 + 2*A
*a*b*d*e*x + A*a^2*d*e)*e^(A/B))*log_integral((d*x + c)*e^(-A/B)/(b*e*x + a
*e)) + 2*((B*b^3*e^2*x^2 + 2*B*a*b^2*e^2*x + B*a^2*b*e^2)*e^(2*A/B)*log((b*
e*x + a*e)/(d*x + c)) + (A*b^3*e^2*x^2 + 2*A*a*b^2*e^2*x + A*a^2*b*e^2)*e^(
2*A/B))*log_integral((d^2*x^2 + 2*c*d*x + c^2)*e^(-2*A/B)/(b^2*e^2*x^2 + 2*
a*b*e^2*x + a^2*e^2)))/((A*B^2*b^4*c^2 - 2*A*B^2*a*b^3*c*d + A*B^2*a^2*b^2*
d^2)*g^3*x^2 + 2*(A*B^2*a*b^3*c^2 - 2*A*B^2*a^2*b^2*c*d + A*B^2*a^3*b*d^2)*
g^3*x + (A*B^2*a^2*b^2*c^2 - 2*A*B^2*a^3*b*c*d + A*B^2*a^4*d^2)*g^3 + ((B^3
*b^4*c^2 - 2*B^3*a*b^3*c*d + B^3*a^2*b^2*d^2)*g^3*x^2 + 2*(B^3*a*b^3*c^2 -
2*B^3*a^2*b^2*c*d + B^3*a^3*b*d^2)*g^3*x + (B^3*a^2*b^2*c^2 - 2*B^3*a^3*b*c
*d + B^3*a^4*d^2)*g^3)*log((b*e*x + a*e)/(d*x + c)))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

3.119 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=182

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{5b}+\frac{2Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}+\frac{2Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{2Bg^4(bc-a}{5}$$

```
[Out] (2*B*(b*c - a*d)^4*g^4*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(5*b*
d^3) + (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g^4*
(a + b*x)^4)/(10*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]))/(5*b) - (2*B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5)
```

Rubi [A] time = 0.109519, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{5b}+\frac{2Bg^4x(bc-ad)^4}{5d^4}-\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}+\frac{2Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{2Bg^4(bc-a}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (2*B*(b*c - a*d)^4*g^4*x)/(5*d^4) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(5*b*
d^3) + (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*g^4*
(a + b*x)^4)/(10*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]))/(5*b) - (2*B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5b} - \frac{B\int \frac{2(bc-ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int \frac{(a+bx)^4}{c+dx}\,dx}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int \left(-\frac{b(bc-ad)^3}{d^4}+\frac{b(bc-}{}\right.}{}$$

$$= \frac{2B(bc-ad)^4g^4x}{5d^4} - \frac{B(bc-ad)^3g^4(a+bx)^2}{5bd^3} + \frac{2B(bc-ad)^2g^4(a+bx)^3}{15bd^2} - $$

Mathematica [A] time = 0.0956361, size = 144, normalized size = 0.79

$$\frac{g^4\left((a+bx)^5\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{B(bc-ad)\left(-6d^2(a+bx)^2(bc-ad)^2+4d^3(a+bx)^3(bc-ad)+12bdx(bc-ad)^3-12(bc-ad)^4\log(c+dx)-3d^4(a+bx)^4\right)}{6d^5}\right)}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(b*c - a*d)
*(12*b*d*(b*c - a*d)^3*x - 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 4*d^3*(b*c - a
*d)*(a + b*x)^3 - 3*d^4*(a + b*x)^4 - 12*(b*c - a*d)^4*Log[c + d*x]))/(6*d^
5)))/(5*b)
```

Maple [B] time = 0.423, size = 1606, normalized size = 8.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] 1/10*B*g^4*b^3*a*x^4-113/30/d^4*B*g^4*b^3*a*c^4+2/5/d^5*B*g^4*b^4*c^5*ln(1/
(d*x+c))+8/d*B*g^4*a^4*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c+2/d*B*g^4*a^4*ln(1
/(d*x+c))*c+1/d*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a^4*c*g^4+1/5/d
^5*B*g^4*b^4*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c^5+8/5/d^5*B*g^4*b^
4*c^5*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+2*B*g^4*b*ln(e*(1/(d*x+c)*a*d-b*c/(d*
x+c)+b)^2/d^2)*a^3*x^2-12*B*g^4/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a
^5*c+2*B*g^4*b^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a^2*x^3+B*g^4*b^
3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*x^4-1/10/d*B*g^4*b^4*c*x^4+5/
6/d^5*B*g^4*b^4*c^5+1/5/d^5*A*g^4*b^4*c^5+1/d*A*g^4*a^4*c+8/5/d*B*g^4*a^4*c
+8/15*B*g^4*b^2*a^2*x^3+1/5*B*g^4*b^4*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/
d^2)*x^5+B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x*a^4*g^4-2/5*B*g^4/b*
a^5*ln(1/(d*x+c))-8/5*B*g^4/b*a^5*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+A*g^4*x^4
*a*b^3+2*A*g^4*x^3*a^2*b^2+2*A*g^4*x^2*a^3*b+6/5*B*g^4*b*a^3*x^2-1/d^4*A*g^
4*a*b^3*c^4+2/d^3*A*g^4*a^2*b^2*c^3-2/d^2*A*g^4*a^3*b*c^2-26/5/d^2*B*g^4*b*
a^3*c^2+98/15/d^3*B*g^4*b^2*a^2*c^3+8/5*B*x*a^4*g^4+1/5*A*g^4*x^5*b^4+A*g^4
*x*a^4-12/d^4*B*g^4/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c^5*b^4-40/
d^2*B*g^4*b^2/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^3*c^3+30/d*B*g^4*
b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^4*c^2+30/d^3*B*g^4*b^3/(a*d-b
*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^4+2/15/d^2*B*g^4*b^4*c^2*x^3-1/5/
d^3*B*g^4*b^4*c^3*x^2+2/5/d^4*B*g^4*b^4*c^4*x-2/d^3*B*g^4*b^3*a*x*c^3-4/d*B
*g^4*b*a^3*x*c-1/d^4*B*g^4*b^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*
c^4+2/d^3*B*g^4*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a^2*b^2*c^3-16/d^
2*B*g^4*b*a^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2+16/d^3*B*g^4*b^2*a^2*ln(1
/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3-8/d^4*B*g^4*b^3*a*ln(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)*c^4-4/d^2*B*g^4*b*a^3*ln(1/(d*x+c))*c^2+2*d*B*g^4/b/(a*d-b*c)*ln(1/(
d*x+c)*a*d-b*c/(d*x+c)+b)*a^6+4/d^3*B*g^4*b^2*a^2*ln(1/(d*x+c))*c^3-2/d^4*B
*g^4*b^3*a*ln(1/(d*x+c))*c^4+2/d^5*B*g^4/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*
x+c)+b)*c^6*b^5-2/d^2*B*g^4*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a^3*b
*c^2-2/3/d*B*g^4*b^3*a*x^3*c+1/d^2*B*g^4*b^3*a*x^2*c^2-2/d*B*g^4*b^2*a^2*x^
2*c+4/d^2*B*g^4*b^2*a^2*x*c^2
```

Maxima [B] time = 1.38107, size = 1195, normalized size = 6.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*
d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*lo
g(d*x + c)/d)*B*a^4*g^4 + 2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) +
2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*
a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*a^
3*b*g^4 + 2*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x
^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)
/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2
*d^2)*x)/(b^2*d^2))*B*a^2*b^2*g^4 + 1/3*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c
*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*
x + c^2)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2
 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x
)/(b^3*d^3))*B*a*b^3*g^4 + 1/30*(6*x^5*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b
^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)
*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

Fricas [B] time = 1.30286, size = 952, normalized size = 5.23

$$\frac{6\,Ab^5d^5g^4x^5 + 12\,Ba^5d^5g^4\log\left(bx+a\right) - 3\left(Bb^5cd^4 - (10\,A+B)ab^4d^5\right)g^4x^4 + 4\left(Bb^5c^2d^3 - 5\,Bab^4cd^4 + (15\,A+4\,B)a^2b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] 1/30*(6*A*b^5*d^5*g^4*x^5 + 12*B*a^5*d^5*g^4*log(b*x + a) - 3*(B*b^5*c*d^4
- (10*A + B)*a*b^4*d^5)*g^4*x^4 + 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 + (15*
A + 4*B)*a^2*b^3*d^5)*g^4*x^3 - 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 10*B
*a^2*b^3*c*d^4 - 2*(5*A + 3*B)*a^3*b^2*d^5)*g^4*x^2 + 6*(2*B*b^5*c^4*d - 10
*B*a*b^4*c^3*d^2 + 20*B*a^2*b^3*c^2*d^3 - 20*B*a^3*b^2*c*d^4 + (5*A + 8*B)*
a^4*b*d^5)*g^4*x - 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 -
 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 6*(B*b^5*d^5*g^
```

```
4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*d^5
*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^
2 + 2*c*d*x + c^2)))/(b*d^5)
```

Sympy [B] time = 8.4322, size = 1018, normalized size = 5.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b**4*g**4*x**5/5 + 2*B*a**5*g**4*log(x + (2*B*a**6*d**5*g**4/b + 10*B*a**
5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g**4 + 20*B*a**3*b**2*c**3*d**2*g**4
- 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b**4*c**5*g**4)/(2*B*a**5*d**5*g**4 +
10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g**4 + 20*B*a**2*b**3*c*
*3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**5*g**4))/(5*b) - 2*B*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4)*log(x + (12*B*a**5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g
**4 + 20*B*a**3*b**2*c**3*d**2*g**4 - 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b*
*4*c**5*g**4 - 2*B*a*c*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*
c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4) + 2*B*b*c**2*g**4*(5*a**4*d**4 - 1
0*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/
(2*B*a**5*d**5*g**4 + 10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g*
*4 + 20*B*a**2*b**3*c**3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**
5*g**4))/(5*d**5) + (B*a**4*g**4*x + 2*B*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g
**4*x**3 + B*a*b**3*g**4*x**4 + B*b**4*g**4*x**5/5)*log(e*(a + b*x)**2/(c +
 d*x)**2) + x**4*(10*A*a*b**3*d*g**4 + B*a*b**3*d*g**4 - B*b**4*c*g**4)/(10
*d) + x**3*(30*A*a**2*b**2*d**2*g**4 + 8*B*a**2*b**2*d**2*g**4 - 10*B*a*b**
3*c*d*g**4 + 2*B*b**4*c**2*g**4)/(15*d**2) + x**2*(10*A*a**3*b*d**3*g**4 +
6*B*a**3*b*d**3*g**4 - 10*B*a**2*b**2*c*d**2*g**4 + 5*B*a*b**3*c**2*d*g**4
- B*b**4*c**3*g**4)/(5*d**3) + x*(5*A*a**4*d**4*g**4 + 8*B*a**4*d**4*g**4 -
 20*B*a**3*b*c*d**3*g**4 + 20*B*a**2*b**2*c**2*d**2*g**4 - 10*B*a*b**3*c**3
*d*g**4 + 2*B*b**4*c**4*g**4)/(5*d**4)
```

Giac [B] time = 162.17, size = 670, normalized size = 3.68

$$\frac{2\,Ba^5g^4\log\left(bx+a\right)}{5\,b}+\frac{1}{5}\left(Ab^4g^4+Bb^4g^4\right)x^5-\frac{\left(Bb^4cg^4-10\,Aab^3dg^4-11\,Bab^3dg^4\right)x^4}{10\,d}+\frac{2\left(Bb^4c^2g^4-5\,Bab^3cdg^4+15\,A\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] 2/5*B*a^5*g^4*log(b*x + a)/b + 1/5*(A*b^4*g^4 + B*b^4*g^4)*x^5 - 1/10*(B*b^
4*c*g^4 - 10*A*a*b^3*d*g^4 - 11*B*a*b^3*d*g^4)*x^4/d + 2/15*(B*b^4*c^2*g^4
- 5*B*a*b^3*c*d*g^4 + 15*A*a^2*b^2*d^2*g^4 + 19*B*a^2*b^2*d^2*g^4)*x^3/d^2
+ 1/5*(B*b^4*g^4*x^5 + 5*B*a*b^3*g^4*x^4 + 10*B*a^2*b^2*g^4*x^3 + 10*B*a^3*
b*g^4*x^2 + 5*B*a^4*g^4*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x
 + c^2)) - 1/5*(B*b^4*c^3*g^4 - 5*B*a*b^3*c^2*d*g^4 + 10*B*a^2*b^2*c*d^2*g^
4 - 10*A*a^3*b*d^3*g^4 - 16*B*a^3*b*d^3*g^4)*x^2/d^3 + 1/5*(2*B*b^4*c^4*g^4
 - 10*B*a*b^3*c^3*d*g^4 + 20*B*a^2*b^2*c^2*d^2*g^4 - 20*B*a^3*b*c*d^3*g^4 +
 5*A*a^4*d^4*g^4 + 13*B*a^4*d^4*g^4)*x/d^4 - 2/5*(B*b^4*c^5*g^4 - 5*B*a*b^3
*c^4*d*g^4 + 10*B*a^2*b^2*c^3*d^2*g^4 - 10*B*a^3*b*c^2*d^3*g^4 + 5*B*a^4*c*
d^4*g^4)*log(-d*x - c)/d^5
```

3.120 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx$

Optimal. Leaf size=151

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4b}-\frac{Bg^3x(bc-ad)^3}{2d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}-\frac{Bg^3(a+bx}{6b}$$

```
[Out] -(B*(b*c - a*d)^3*g^3*x)/(2*d^3) + (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(4*b*d
^2) - (B*(b*c - a*d)*g^3*(a + b*x)^3)/(6*b*d) + (g^3*(a + b*x)^4*(A + B*Log
[(e*(a + b*x)^2)/(c + d*x)^2]))/(4*b) + (B*(b*c - a*d)^4*g^3*Log[c + d*x])/
(2*b*d^4)
```

Rubi [A] time = 0.0970548, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4b}-\frac{Bg^3x(bc-ad)^3}{2d^3}+\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}+\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}-\frac{Bg^3(a+bx}{6b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -(B*(b*c - a*d)^3*g^3*x)/(2*d^3) + (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(4*b*d
^2) - (B*(b*c - a*d)*g^3*(a + b*x)^3)/(6*b*d) + (g^3*(a + b*x)^4*(A + B*Log
[(e*(a + b*x)^2)/(c + d*x)^2]))/(4*b) + (B*(b*c - a*d)^4*g^3*Log[c + d*x])/
(2*b*d^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4b} - \frac{B\int\frac{2(bc-ad)g^4(a+bx)^3}{c+dx}\,dx}{4bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3}{c+dx}\,dx}{2b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2}{d^3} - \frac{b(bc-ad)(}{d^2}\right.}{2b}$$

$$= -\frac{B(bc-ad)^3g^3x}{2d^3} + \frac{B(bc-ad)^2g^3(a+bx)^2}{4bd^2} - \frac{B(bc-ad)g^3(a+bx)^3}{6bd} + \frac{g^3}{}$$

Mathematica [A] time = 0.0896554, size = 122, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{3d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - (B*(b*c - a*d)
*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x
)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/(3*d^4)))/(4*b)
```

Maple [B] time = 0.24, size = 1249, normalized size = 8.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] 1/4*A*g^3*x^4*b^3+A*g^3*x*a^3+3/2*B*x*a^3*g^3+19/6/d^3*B*g^3*b^2*a*c^3-3/2/
d^2*A*g^3*a^2*b*c^2+1/d^3*A*g^3*a*b^2*c^3+B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)
+b)^2/d^2)*x*a^3*g^3+1/4*B*g^3*b^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2
)*x^4+A*g^3*x^3*a*b^2+3/4*B*g^3*b*a^2*x^2+3/2/d*B*a^3*c*g^3-11/12/d^4*B*g^3
*b^3*c^4-1/4/d^4*A*g^3*b^3*c^4+1/d*A*g^3*a^3*c+3/2*A*g^3*x^2*a^2*b-3/2*B*g^
3/b*a^4*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)-1/2*B*g^3/b*a^4*ln(1/(d*x+c))-15/4/
d^2*B*g^3*b*a^2*c^2+1/6*B*g^3*b^2*a*x^3-20/d^2*B*g^3*b^2/(a*d-b*c)*ln(1/(d*
x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^3-1/4/d^4*B*g^3*b^3*ln(e*(1/(d*x+c)*a*d-b*c/(
d*x+c)+b)^2/d^2)*c^4+3/2*B*g^3*b*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*
a^2*x^2+B*g^3*b^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*x^3-10*B*g^3/
(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^4*c+20/d*B*g^3*b/(a*d-b*c)*ln(1
/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^3*c^2+10/d^3*B*g^3/(a*d-b*c)*ln(1/(d*x+c)*a*d
-b*c/(d*x+c)+b)*a*c^4*b^3-1/6/d*B*g^3*b^3*c*x^3+1/4/d^2*B*g^3*b^3*c^2*x^2-1
/2/d^3*B*g^3*b^3*c^3*x-1/2/d^4*B*g^3*b^3*c^4*ln(1/(d*x+c))-3/2/d^4*B*g^3*b^
3*c^4*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+1/d*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)
+b)^2/d^2)*a^3*c*g^3+6/d*B*g^3*a^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c+2/d*B*
g^3*a^3*ln(1/(d*x+c))*c+2*d*B*g^3/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+
b)*a^5+1/d^3*B*g^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*b^2*c^3-3/2/
d^2*B*g^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a^2*b*c^2-1/d*B*g^3*b^2
*a*x^2*c+2/d^2*B*g^3*b^2*a*x*c^2-3/d*B*g^3*a^2*b*c*x+2/d^3*B*g^3*b^2*a*ln(1
/(d*x+c))*c^3-2/d^4*B*g^3/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^5*b^4
+6/d^3*B*g^3*b^2*a*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3-3/d^2*B*g^3*b*a^2*ln
(1/(d*x+c))*c^2-9/d^2*B*g^3*b*a^2*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2
```

Maxima [B] time = 1.36102, size = 873, normalized size = 5.78

$$\frac{1}{4}Ab^3g^3x^4 + Aab^2g^3x^3 + \frac{3}{2}Aa^2bg^3x^2 + \left(x\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2} + \frac{2\,abex}{d^2x^2+2\,cdx+c^2} + \frac{a^2e}{d^2x^2+2\,cdx+c^2}\right) + \frac{2\,a\log(b}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(b^2*e*x^
2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(
d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*a^3*
```

```
g^3 + 3/2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2
 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b
^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + (x^3*log
(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2)
+ a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x
 + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*
B*a*b^2*g^3 + 1/12*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e
*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log
(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^
3 + A*a^3*g^3*x
```

Fricas [B] time = 1.16277, size = 709, normalized size = 4.7

$$\frac{3\,Ab^4d^4g^3x^4 + 6\,Ba^4d^4g^3\log\left(bx+a\right) - 2\left(Bb^4cd^3 - (6\,A+B)ab^3d^4\right)g^3x^3 + 3\left(Bb^4c^2d^2 - 4\,Bab^3cd^3 + 3\,(2\,A+B)a^2b^2d^4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] 1/12*(3*A*b^4*d^4*g^3*x^4 + 6*B*a^4*d^4*g^3*log(b*x + a) - 2*(B*b^4*c*d^3 -
 (6*A + B)*a*b^3*d^4)*g^3*x^3 + 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + 3*(2*A
 + B)*a^2*b^2*d^4)*g^3*x^2 - 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*b
^2*c*d^3 - (2*A + 3*B)*a^3*b*d^4)*g^3*x + 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 3*(B*b^4*d^4*g^3*
x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*x
)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b*d^4)
```

Sympy [B] time = 5.73868, size = 722, normalized size = 4.78

$$\frac{Ab^3g^3x^4}{4} + \frac{Ba^4g^3\log\left(x + \frac{\frac{Ba^5d^4g^3}{b} + 4Ba^4cd^3g^3 - 6Ba^3bc^2d^2g^3 + 4Ba^2b^2c^3dg^3 - Bab^3c^4g^3}{Ba^4d^4g^3 + 4Ba^3bcd^3g^3 - 6Ba^2b^2c^2d^2g^3 + 4Bab^3c^3dg^3 - Bb^4c^4g^3}\right)}{2b} - \frac{Bcg^3\left(2ad-bc\right)\left(2a^2d^2 - 2abcd + b^2c^2\right)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b**3*g**3*x**4/4 + B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*b) - B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*d**4) + (B*a**3*g**3*x + 3*B*a**2
*b*g**3*x**2/2 + B*a*b**2*g**3*x**3 + B*b**3*g**3*x**4/4)*log(e*(a + b*x)**
2/(c + d*x)**2) + x**3*(6*A*a*b**2*d*g**3 + B*a*b**2*d*g**3 - B*b**3*c*g**3
)/(6*d) + x**2*(6*A*a**2*b*d**2*g**3 + 3*B*a**2*b*d**2*g**3 - 4*B*a*b**2*c*
d*g**3 + B*b**3*c**2*g**3)/(4*d**2) + x*(2*A*a**3*d**3*g**3 + 3*B*a**3*d**3
*g**3 - 6*B*a**2*b*c*d**2*g**3 + 4*B*a*b**2*c**2*d*g**3 - B*b**3*c**3*g**3)
/(2*d**3)
```

Giac [B] time = 27.5013, size = 487, normalized size = 3.23

$$\frac{Ba^4g^3\log(bx+a)}{2\,b} + \frac{1}{4}\left(Ab^3g^3 + Bb^3g^3\right)x^4 - \frac{\left(Bb^3cg^3 - 6\,Aab^2dg^3 - 7\,Bab^2dg^3\right)x^3}{6\,d} + \frac{1}{4}\left(Bb^3g^3x^4 + 4\,Bab^2g^3x^3 + 6\,Ba^2bg\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] 1/2*B*a^4*g^3*log(b*x + a)/b + 1/4*(A*b^3*g^3 + B*b^3*g^3)*x^4 - 1/6*(B*b^3
*c*g^3 - 6*A*a*b^2*d*g^3 - 7*B*a*b^2*d*g^3)*x^3/d + 1/4*(B*b^3*g^3*x^4 + 4*
B*a*b^2*g^3*x^3 + 6*B*a^2*b*g^3*x^2 + 4*B*a^3*g^3*x)*log((b^2*x^2 + 2*a*b*x
 + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) + 1/4*(B*b^3*c^2*g^3 - 4*B*a*b^2*c*d*g^3
 + 6*A*a^2*b*d^2*g^3 + 9*B*a^2*b*d^2*g^3)*x^2/d^2 - 1/2*(B*b^3*c^3*g^3 - 4*
B*a*b^2*c^2*d*g^3 + 6*B*a^2*b*c*d^2*g^3 - 2*A*a^3*d^3*g^3 - 5*B*a^3*d^3*g^3
)*x/d^3 + 1/2*(B*b^3*c^4*g^3 - 4*B*a*b^2*c^3*d*g^3 + 6*B*a^2*b*c^2*d^2*g^3
- 4*B*a^3*c*d^3*g^3)*log(d*x + c)/d^4
```

3.121 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx$

Optimal. Leaf size=120

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3b}+\frac{2Bg^2x(bc-ad)^2}{3d^2}-\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

```
[Out] (2*B*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B*(b*c - a*d)*g^2*(a + b*x)^2)/(3*b*d)
 + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b) - (2*B*
(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3)
```

Rubi [A] time = 0.0741202, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3b}+\frac{2Bg^2x(bc-ad)^2}{3d^2}-\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```


```
[Out] (2*B*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B*(b*c - a*d)*g^2*(a + b*x)^2)/(3*b*d)
 + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b) - (2*B*
(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx &= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b}-\frac{B\int\frac{2(bc-ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}\\ &= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b}-\frac{\left(2B(bc-ad)g^2\right)\int\frac{(a+bx)^2}{c+dx}\,dx}{3b}\\ &= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b}-\frac{\left(2B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{d^2}+\frac{b(a+bx)}{d}\right.}{3b}\\ &= \frac{2B(bc-ad)^2g^2x}{3d^2}-\frac{B(bc-ad)g^2(a+bx)^2}{3bd}+\frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)}{(c+dx)^2}\right.\right.}{3b}\end{aligned}$$

Mathematica [A] time = 0.0524115, size = 98, normalized size = 0.82

$$\frac{g^2\left(\frac{B(ad-bc)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{d^3}+(a+bx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(-(b*c) + a
*d)*(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c - a*d)^2*Log[c + d
*x]))/d^3))/(3*b)
```

Maple [B] time = 0.243, size = 915, normalized size = 7.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] -1/d^2*A*g^2*a*b*c^2-7/3/d^2*B*g^2*b*a*c^2+2/d^3*B*g^2/(a*d-b*c)*ln(1/(d*x+
c)*a*d-b*c/(d*x+c)+b)*c^4*b^3+1/3*A*g^2*x^3*b^2+A*g^2*x*a^2+4/3*B*x*a^2*g^2
+A*g^2*x^2*a*b+4/3/d^3*B*g^2*b^2*c^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+B*g^2*
b*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*x^2+2/d*B*g^2*a^2*ln(1/(d*x+c
))*c+4/d*B*g^2*a^2*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c+1/d*B*ln(e*(1/(d*x+c)*
a*d-b*c/(d*x+c)+b)^2/d^2)*a^2*c*g^2-8*B*g^2/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/
(d*x+c)+b)*a^3*c+1/3/d^3*B*g^2*b^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2
)*c^3+2/3/d^3*B*g^2*b^2*c^3*ln(1/(d*x+c))+2/3/d^2*B*g^2*b^2*c^2*x-2/d^2*B*g
^2*b*a*ln(1/(d*x+c))*c^2-1/d^2*B*g^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d
^2)*a*b*c^2-4/d^2*B*g^2*b*a*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2-2/d*B*g^2*b
*a*x*c+2*d*B*g^2/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^4+12/d*B*g^2
*b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^2-8/d^2*B*g^2/(a*d-b*c)*
ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c^3*b^2+1/3*B*g^2*b*a*x^2-2/3*B*g^2/b*a^3
*ln(1/(d*x+c))+4/3/d*B*a^2*c*g^2+1/d^3*B*g^2*b^2*c^3+1/3/d^3*A*g^2*b^2*c^3+
1/d*A*g^2*a^2*c-1/3/d*B*g^2*b^2*c*x^2-4/3*B*g^2/b*a^3*ln(1/(d*x+c)*a*d-b*c/
(d*x+c)+b)+1/3*B*g^2*b^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x^3+B*ln
(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x*a^2*g^2
```

Maxima [B] time = 1.28289, size = 590, normalized size = 4.92

$$\frac{1}{3}Ab^2g^2x^3 + Aabg^2x^2 + \left(x\log\left(\frac{b^2ex^2}{d^2x^2+2cdx+c^2} + \frac{2abex}{d^2x^2+2cdx+c^2} + \frac{a^2e}{d^2x^2+2cdx+c^2}\right) + \frac{2a\log(bx+a)}{b} - \frac{2c\log\ldots}{\ldots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(b^2*e*x^2
/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d
^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2
- 2*(b*c - a*d)*x/(b*d))*B*a*b*g^2 + 1/3*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*
d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
 + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

Fricas [B] time = 1.09778, size = 508, normalized size = 4.23

$$\frac{Ab^3d^3g^2x^3 + 2\,Ba^3d^3g^2\log(bx+a) - \left(Bb^3cd^2 - (3\,A+B)ab^2d^3\right)g^2x^2 + \left(2\,Bb^3c^2d - 6\,Bab^2cd^2 + (3\,A+4\,B)a^2bd^3\right)g^2x - }{3\,bd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] 1/3*(A*b^3*d^3*g^2*x^3 + 2*B*a^3*d^3*g^2*log(b*x + a) - (B*b^3*c*d^2 - (3*A
 + B)*a*b^2*d^3)*g^2*x^2 + (2*B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + (3*A + 4*B)*a
^2*b*d^3)*g^2*x - 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*log
(d*x + c) + (B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*g^2*
x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b*d^3)
```

Sympy [B] time = 4.00468, size = 527, normalized size = 4.39

$$\frac{Ab^2g^2x^3}{3} + \frac{2Ba^3g^2\log\left(x + \frac{\frac{2Ba^4d^3g^2}{b} + 6Ba^3cd^2g^2 - 6Ba^2bc^2dg^2 + 2Bab^2c^3g^2}{2Ba^3d^3g^2 + 6Ba^2bcd^2g^2 - 6Bab^2c^2dg^2 + 2Bb^3c^3g^2}\right)}{3b} - \frac{2Bcg^2\left(3a^2d^2 - 3abcd + b^2c^2\right)\log\left(x + \frac{8Ba^3cd^2g^2 - 6Ba^2b}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b**2*g**2*x**3/3 + 2*B*a**3*g**2*log(x + (2*B*a**4*d**3*g**2/b + 6*B*a**3
*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2)/(2*B*a**3*d**
3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g*
*2))/(3*b) - 2*B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (8*B*
a**3*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2 - 2*B*a*c*
g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2) + 2*B*b*c**2*g**2*(3*a**2*d**2 -
 3*a*b*c*d + b**2*c**2)/d)/(2*B*a**3*d**3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6
*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g**2))/(3*d**3) + (B*a**2*g**2*x + B*
a*b*g**2*x**2 + B*b**2*g**2*x**3/3)*log(e*(a + b*x)**2/(c + d*x)**2) + x**2
*(3*A*a*b*d*g**2 + B*a*b*d*g**2 - B*b**2*c*g**2)/(3*d) + x*(3*A*a**2*d**2*g
**2 + 4*B*a**2*d**2*g**2 - 6*B*a*b*c*d*g**2 + 2*B*b**2*c**2*g**2)/(3*d**2)
```

<u>Giac</u> [B] time = 4.79757, size = 340, normalized size = 2.83

$$\frac{2\,Ba^3g^2\log\left(bx+a\right)}{3\,b}+\frac{1}{3}\left(Ab^2g^2+Bb^2g^2\right)x^3-\frac{\left(Bb^2cg^2-3\,Aabdg^2-4\,Babdg^2\right)x^2}{3\,d}+\frac{1}{3}\left(Bb^2g^2x^3+3\,Babg^2x^2+3\,Ba^2g^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] 2/3*B*a^3*g^2*log(b*x + a)/b + 1/3*(A*b^2*g^2 + B*b^2*g^2)*x^3 - 1/3*(B*b^2
*c*g^2 - 3*A*a*b*d*g^2 - 4*B*a*b*d*g^2)*x^2/d + 1/3*(B*b^2*g^2*x^3 + 3*B*a*
b*g^2*x^2 + 3*B*a^2*g^2*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x
 + c^2)) + 1/3*(2*B*b^2*c^2*g^2 - 6*B*a*b*c*d*g^2 + 3*A*a^2*d^2*g^2 + 7*B*a
^2*d^2*g^2)*x/d^2 - 2/3*(B*b^2*c^3*g^2 - 3*B*a*b*c^2*d*g^2 + 3*B*a^2*c*d^2*
g^2)*log(-d*x - c)/d^3
```

3.122 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=78

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}-\frac{Bgx(bc-ad)}{d}$$

```
[Out] -((B*(b*c - a*d)*g*x)/d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(2*b) + (B*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2)
```

Rubi [A] time = 0.0568225, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2b}+\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}-\frac{Bgx(bc-ad)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -((B*(b*c - a*d)*g*x)/d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(2*b) + (B*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} - \frac{B\int\frac{2(bc-ad)g^2(a+bx)}{c+dx}\,dx}{2bg}$$
$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\frac{a+bx}{c+dx}\,dx}{b}$$
$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} - \frac{(B(bc-ad)g)\int\left(\frac{b}{d}+\frac{-bc+ad}{d(c+dx)}\right)dx}{b}$$
$$= -\frac{B(bc-ad)gx}{d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b} + \frac{B(bc-ad)^2g\log(c+}{bd^2}$$

Mathematica [A] time = 0.0360573, size = 72, normalized size = 0.92

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{2B(ad-bc)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (2*B*(-(b*c) + a
*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2))/(2*b)
```

Maple [B] time = 0.235, size = 560, normalized size = 7.2

$$-\frac{gBbcx}{d} - \frac{gBbc^2}{2\,d^2}\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\right) + \frac{gBbx^2}{2}\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\right) + B\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] -1/d*g*B*b*c*x-1/2/d^2*B*g*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*b*c^2+
1/2*B*g*b*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x^2+B*ln(e*(1/(d*x+c)*a
*d-b*c/(d*x+c)+b)^2/d^2)*x*a*g-1/d^2*B*g*b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*
c^2-B*g/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2+1/d*B*g*a*c-1/d^2*B*g*c^2*b-1
/d^2*B*g*ln(1/(d*x+c))*c^2*b-B*g/b*ln(1/(d*x+c))*a^2+g*B*a*x+g*A*a*x-1/2/d^
2*A*g*c^2*b+1/2*A*g*x^2*b+2/d*B*g*ln(1/(d*x+c))*a*c+2/d*B*g*ln(1/(d*x+c)*a*
d-b*c/(d*x+c)+b)*a*c+1/d*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*c*g+
1/d*A*g*a*c+2*d*B*g/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^3-6*B*g/(
a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c+6/d*B*g/(a*d-b*c)*ln(1/(d*x+
c)*a*d-b*c/(d*x+c)+b)*a*c^2*b-2/d^2*B*g/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)*c^3*b^2
```

Maxima [B] time = 1.22796, size = 338, normalized size = 4.33

$$\frac{1}{2}\,Abgx^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)+\frac{2\,a\log\left(bx+a\right)}{b}-\frac{2\,c\log\left(dx+c\right)}{d}\right)Bag$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2
*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)
/b - 2*c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x
+ c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c
^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b
*d))*B*b*g + A*a*g*x
```

Fricas [A] time = 1.08462, size = 329, normalized size = 4.22

$$\frac{Ab^2d^2gx^2+2\,Ba^2d^2g\log\left(bx+a\right)-2\left(Bb^2cd-(A+B)abd^2\right)gx+2\left(Bb^2c^2-2\,Babcd\right)g\log\left(dx+c\right)+\left(Bb^2d^2gx^2+2\,Bab\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + 2*B*a^2*d^2*g*log(b*x + a) - 2*(B*b^2*c*d - (A + B)*
a*b*d^2)*g*x + 2*(B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^
2 + 2*B*a*b*d^2*g*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
 + c^2)))/(b*d^2)
```

Sympy [B] time = 2.46477, size = 253, normalized size = 3.24

$$\frac{Abgx^2}{2} + \frac{Ba^2g\log\left(x + \frac{\frac{Ba^3d^2g}{b}+2Ba^2cdg-Babc^2g}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{b} - \frac{Bcg\,(2ad-bc)\log\left(x + \frac{3Ba^2cdg-Babc^2g-Bacg(2ad-bc)+\frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{d^2} + \Big(Bagx +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*b*g*x**2/2 + B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/b - B*c*g*(2*a*d -
b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B*b*c
**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/d**
2 + (B*a*g*x + B*b*g*x**2/2)*log(e*(a + b*x)**2/(c + d*x)**2) + x*(A*a*d*g
+ B*a*d*g - B*b*c*g)/d
```

Giac [A] time = 1.74159, size = 177, normalized size = 2.27

$$\frac{Ba^2g\log(bx+a)}{b} + \frac{1}{2}\left(Abg + Bbg\right)x^2 + \frac{1}{2}\left(Bbgx^2 + 2\,Bagx\right)\log\left(\frac{b^2x^2 + 2\,abx + a^2}{d^2x^2 + 2\,cdx + c^2}\right) - \frac{\left(Bbcg - Aadg - 2\,Badg\right)x}{d} + \frac{(B$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] B*a^2*g*log(b*x + a)/b + 1/2*(A*b*g + B*b*g)*x^2 + 1/2*(B*b*g*x^2 + 2*B*a*g
*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) - (B*b*c*g - A
*a*d*g - 2*B*a*d*g)*x/d + (B*b*c^2*g - 2*B*a*c*d*g)*log(d*x + c)/d^2
```

3.123 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=83

$$\frac{2B\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2
]))/(b*g)) + (2*B*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*g)
```

Rubi [A] time = 0.292001, antiderivative size = 122, normalized size of antiderivative = 1.47, number of steps used = 10, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg}+\frac{2B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}-\frac{B\log^2(g(a+bx))}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x),x]
```

```
[Out] -((B*Log[g*(a + b*x)]^2)/(b*g)) + ((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
*Log[a*g + b*g*x])/(b*g) + (2*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*
g*x])/(b*g) + (2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(ag+bgx)}{e(a+bx)^2}dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(ag+bgx)}{(a+bx)^2}dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int\left(\frac{2be\log(ag+bgx)}{a+bx}-\frac{2de\log(ag+bgx)}{c+dx}\right)dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{(2B)\int\frac{\log(ag+bgx)}{a+bx}dx}{g} + \frac{(2Bd)\int\frac{\log(ag+bgx)}{c+dx}dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - (2B)\int\frac{\log\left(\frac{bg(c+dx)}{bcg-adg}\right.}{ag+bgx}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{(2B)\,\mathrm{Subst}\left(\int\frac{\log(x}{x}\right.}{bg}$$

$$= -\frac{B\log^2(g(a+bx))}{bg} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg}$$

Mathematica [A] time = 0.037118, size = 88, normalized size = 1.06

$$\frac{2B\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+2B\log\left(\frac{b(c+dx)}{bc-ad}\right)-B\log(a+bx)+A\right)}{bg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x),x]
```

```
[Out] (Log[a + b*x]*(A - B*Log[a + b*x] + B*Log[(e*(a + b*x)^2)/(c + d*x)^2] + 2*
B*Log[(b*(c + d*x))/(b*c - a*d)]) + 2*B*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)])/(b*g)
```

Maple [B] time = 0.375, size = 552, normalized size = 6.7

$$-\frac{A\ln\left((dx+c)^{-1}\right)}{bg}+\frac{dAa}{bg\,(ad-bc)}\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)-\frac{Ac}{g\,(ad-bc)}\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)-\frac{B\ln\left((dx+c)^{-1}\right)}{bg}\ \mathrm{l}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x)
```

```
[Out] -1/g*A/b*ln(1/(d*x+c))+d/g*A/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a-
1/g*A/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c-1/g*B/b*ln(1/(d*x+c))*ln(
e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+2*d/g*B/b*dilog((1/(d*x+c)*(a*d-b*c)
+b)/b)/(a*d-b*c)*a-2/g*B*dilog((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*c+2*d/g
*B/b*ln(1/(d*x+c))*ln((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*a-2/g*B*ln(1/(d*
x+c))*ln((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*c+d/g*B/b*ln(1/(d*x+c)*(a*d-b
*c)+b)/(a*d-b*c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a-1/g*B*ln(1/(d*
x+c)*(a*d-b*c)+b)/(a*d-b*c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c-d/g
*B/b/(a*d-b*c)*ln(1/(d*x+c)*(a*d-b*c)+b)^2*a+1/g*B/(a*d-b*c)*ln(1/(d*x+c)*(
a*d-b*c)+b)^2*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B\left(\frac{2\,\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int\frac{bdx\log\left(e\right)+bc\log\left(e\right)+2\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^{2}dgx^{2}+abcg+\left(b^{2}cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+ag\right)}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x, algorithm="maxima
")
```

```
[Out] -B*(2*log(b*x + a)*log(d*x + c)/(b*g) - integrate((b*d*x*log(e) + b*c*log(e
) + 2*(2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g
 + a*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x, algorithm="fricas
")
```

```
[Out] integral((B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log \left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}{bgx + ag} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)/(b*g*x + a*g), x)
```

3.124 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=65

$$-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{2B}{bg^2(a+bx)}$$

```
[Out] (-2*B)/(b*g^2*(a + b*x)) - ((c + d*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]))/((b*c - a*d)*g^2*(a + b*x))
```

Rubi [A] time = 0.0774241, antiderivative size = 105, normalized size of antiderivative = 1.62, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{bg^2(a+bx)}-\frac{2Bd\log(a+bx)}{bg^2(bc-ad)}+\frac{2Bd\log(c+dx)}{bg^2(bc-ad)}-\frac{2B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] (-2*B)/(b*g^2*(a + b*x)) - (2*B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b*g^2*(a + b*x)) + (2*B*d*Log[c + d*x]
)/(b*(b*c - a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{B\int\frac{2(bc-ad)}{g(a+bx)^2(c+dx)}\,dx}{bg}\\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{(2B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2}\\
&= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2}-\frac{bd}{(bc-ad)^2(a+bx)}+\frac{d^2}{(bc-ad)^2(c+dx)}\right)dx}{bg^2}\\
&= -\frac{2B}{bg^2(a+bx)}-\frac{2Bd\log(a+bx)}{b(bc-ad)g^2}-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bg^2(a+bx)}+\frac{2Bd\log(c+dx)}{b(bc-ad)g^2}
\end{aligned}$$

Mathematica [A] time = 0.058319, size = 111, normalized size = 1.71

$$\frac{2B(bc-ad)\left(-\frac{1}{(a+bx)(bc-ad)}-\frac{d\log(a+bx)}{(bc-ad)^2}+\frac{d\log(c+dx)}{(bc-ad)^2}\right)}{bg^2}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b*g^2*(a + b*x))) + (2*B*(b*c -
 a*d)*(-(1/((b*c - a*d)*(a + b*x))) - (d*Log[a + b*x])/(b*c - a*d)^2 + (d*L
og[c + d*x])/(b*c - a*d)^2))/(b*g^2)
```

Maple [B] time = 0.079, size = 157, normalized size = 2.4

$$\frac{dA}{g^2(ad-bc)}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-1}-2\,\frac{dB}{g^2b(dx+c)}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-1}+\frac{dB}{g^2(ad-bc)}\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x)
```

```
[Out] d/g^2*A/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)/(a*d-b*c)-2*d/g^2/(1/(d*x+c)*a*d-b*c/
(d*x+c)+b)*B/b/(d*x+c)+d/g^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*B/(a*d-b*c)*ln(e
*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 1.23987, size = 252, normalized size = 3.88

$$-B\left(\frac{\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)}{b^2g^2x+abg^2}+\frac{2}{b^2g^2x+abg^2}+\frac{2\,d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}-\frac{2\,d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)-\frac{A}{b^2g^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x, algorithm="maxi
ma")
```

```
[Out] -B*(log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x
+ c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^2*g^2*x + a*b*g^2) + 2/(b^2*g^
2*x + a*b*g^2) + 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - 2*d*log(d*x + c)/
((b^2*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.01482, size = 228, normalized size = 3.51

$$-\frac{(A+2\,B)bc-(A+2\,B)ad+(Bbdx+Bbc)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x, algorithm="fric
as")
```

```
[Out] -((A + 2*B)*b*c - (A + 2*B)*a*d + (B*b*d*x + B*b*c)*log((b^2*e*x^2 + 2*a*b*
e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*
c - a^2*b*d)*g^2)
```

Sympy [B] time = 1.91317, size = 253, normalized size = 3.89

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{abg^2+b^2g^2x}-\frac{2Bd\log\left(x+\frac{-\frac{2Ba^2d^3}{ad-bc}+\frac{4Babcd^2}{ad-bc}+2Bad^2-\frac{2Bb^2c^2d}{ad-bc}+2Bbcd}{4Bbd^2}\right)}{bg^2\left(ad-bc\right)}+\frac{2Bd\log\left(x+\frac{\frac{2Ba^2d^3}{ad-bc}-\frac{4Babcd^2}{ad-bc}+2Bad^2+\frac{2Bb^2c^2d}{ad-bc}+2Bbcd}{4Bbd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{\cdots}{ab\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(a*b*g**2 + b**2*g**2*x) - 2*B*d*log(x
+ (-2*B*a**2*d**3/(a*d - b*c) + 4*B*a*b*c*d**2/(a*d - b*c) + 2*B*a*d**2 - 2
*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*(a*d - b*c))
+ 2*B*d*log(x + (2*B*a**2*d**3/(a*d - b*c) - 4*B*a*b*c*d**2/(a*d - b*c) + 2
*B*a*d**2 + 2*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*
(a*d - b*c)) - (A + 2*B)/(a*b*g**2 + b**2*g**2*x)
```

Giac [B] time = 1.39159, size = 254, normalized size = 3.91

$$\left(2\left(b^2cg^2-abdg^2\right)\left(\frac{d\log\left(\left|\frac{bcg}{bgx+ag}-\frac{adg}{bgx+ag}+d\right|\right)}{b^4c^2g^4-2\,ab^3cdg^4+a^2b^2d^2g^4}-\frac{1}{\left(b^2cg^2-abdg^2\right)\left(bgx+ag\right)bg}\right)-\frac{\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)}{\left(bgx+ag\right)bg}\right)B-\frac{A}{\left(bgx+ag\right)bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^2,x, algorithm="giac
")
```

```
[Out] (2*(b^2*c*g^2 - a*b*d*g^2)*(d*log(abs(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x +
a*g) + d))/(b^4*c^2*g^4 - 2*a*b^3*c*d*g^4 + a^2*b^2*d^2*g^4) - 1/((b^2*c*g^
2 - a*b*d*g^2)*(b*g*x + a*g)*b*g)) - log((b*x + a)^2*e/(d*x + c)^2)/((b*g*x
 + a*g)*b*g))*B - A/((b*g*x + a*g)*b*g)
```

3.125 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=138

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}+\frac{Bd}{bg^3(a+bx)(bc-ad)}-\frac{B}{2bg^3(a+bx)^2}$$

```
[Out] -B/(2*b*g^3*(a + b*x)^2) + (B*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (B*d^2*Log
[a + b*x])/(b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
/(2*b*g^3*(a + b*x)^2) - (B*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3)
```

Rubi [A] time = 0.0934478, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2bg^3(a+bx)^2}+\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}+\frac{Bd}{bg^3(a+bx)(bc-ad)}-\frac{B}{2bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] -B/(2*b*g^3*(a + b*x)^2) + (B*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (B*d^2*Log
[a + b*x])/(b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
/(2*b*g^3*(a + b*x)^2) - (B*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^3}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{2(bc-ad)}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}-\frac{d^3}{(bc-ad)^3}\right.}{bg^3}$$

$$= -\frac{B}{2bg^3(a+bx)^2}+\frac{Bd}{b(bc-ad)g^3(a+bx)}+\frac{Bd^2\log(a+bx)}{b(bc-ad)^2g^3}-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2bg^3(a+bx)^2}-\frac{Bd^2\log(}{b(bc-}$$

Mathematica [A] time = 0.136493, size = 109, normalized size = 0.79

$$-\frac{\frac{B\left(2d^2(a+bx)^2\log(c+dx)+(bc-ad)(b(c-2dx)-3ad)-2d^2(a+bx)^2\log(a+bx)\right)}{(bc-ad)^2}+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] -(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2] + (B*((b*c - a*d)*(-3*a*d + b*(c -
 2*d*x)) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x])
)/(b*c - a*d)^2)/(2*b*g^3*(a + b*x)^2)
```

Maple [B] time = 0.108, size = 355, normalized size = 2.6

$$-\frac{d^2Ab}{2g^3(ad-bc)^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-2}+\frac{d^2A}{g^3(ad-bc)^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-1}-\frac{d^2B}{g^3(ad-bc)(dx+c)}\left(\frac{ad}{dx+c}-\frac{bc}{dx+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2*d^2/g^3*A*b/(a*d-b*c)^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2+d^2/g^3*A/(a*d
-b*c)^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)-d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)
^2*B/(a*d-b*c)/(d*x+c)-3/2*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*B/b/(d*x
+c)^2+1/2*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*b*B/(a^2*d^2-2*a*b*c*d+b^
2*c^2)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d^2/g^3/(1/(d*x+c)*a*d-b*c
/(d*x+c)+b)^2*B/(a*d-b*c)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 1.29435, size = 414, normalized size = 3.

$$\frac{1}{2}B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}-\frac{\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)}{b^3g^3x^2+2\,ab^2g^3x+a^2bg^3}+\frac{}{(b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) - log(b^2*e*x^2/(d^2*x^2 + 2*c*
d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
 + c^2))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b
^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a
*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^
3)
```

Fricas [A] time = 1.05097, size = 495, normalized size = 3.59

$$-\frac{(A+B)b^2c^2-2\,(A+2\,B)abcd+(A+3\,B)a^2d^2-2\left(Bb^2cd-Babd^2\right)x-\left(Bb^2d^2x^2+2\,Babd^2x-Bb^2c^2+2\,Babcd\right)\log\left(\right.}{2\left(\left(b^5c^2-2\,ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2\,a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2\,a^3b^2cd+a^4bd^2\right)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x, algorithm="fric
as")
```

```
[Out] -1/2*((A + B)*b^2*c^2 - 2*(A + 2*B)*a*b*c*d + (A + 3*B)*a^2*d^2 - 2*(B*b^2*
c*d - B*a*b*d^2)*x - (B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a*b*c
*d)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^5*c
^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^
3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 3.17597, size = 418, normalized size = 3.03

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}-\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{bg^3(ad-bc)^2}+\frac{Bd^2\log\left(x+\frac{\frac{Ba^3d^5}{(ad-bc)^2}-\frac{3Ba^2bcd^4}{(ad-bc)^2}+}{}\right.}{bg^3(ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b*
*3*g**3*x**2) - B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*
d**4/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b*
*3*c**3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)
**2) + B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d
- b*c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d*
*2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)**2) - (A*
a*d - A*b*c + 3*B*a*d - B*b*c + 2*B*b*d*x)/(2*a**3*b*d*g**3 - 2*a**2*b**2*c
*g**3 + x**2*(2*a*b**3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4*
a*b**3*c*g**3))
```

Giac [A] time = 1.31868, size = 356, normalized size = 2.58

$$\frac{Bd^2\log(bx+a)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}-\frac{Bd^2\log(dx+c)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}-\frac{B\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}+\frac{2\,Bbdx}{2\left(b^4cg^3x^2-ab^3dg^3x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^3,x, algorithm="giac
")
```

```
[Out] B*d^2*log(b*x + a)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - B*d^2*
log(d*x + c)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/2*B*log((b
^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*g^3*x^2 + 2*a*b^2*g
^3*x + a^2*b*g^3) + 1/2*(2*B*b*d*x - A*b*c - 2*B*b*c + A*a*d + 4*B*a*d)/(b^
4*c*g^3*x^2 - a*b^3*d*g^3*x^2 + 2*a*b^3*c*g^3*x - 2*a^2*b^2*d*g^3*x + a^2*b
^2*c*g^3 - a^3*b*d*g^3)
```

3.126 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=177

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3bg^4(a+bx)^3}-\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}-\frac{}{9bg^4}$$

```
[Out] (-2*B)/(9*b*g^4*(a + b*x)^3) + (B*d)/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) - (2
*B*d^2)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (2*B*d^3*Log[a + b*x])/(3*b*(b*
c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(3*b*g^4*(a + b*
x)^3) + (2*B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4)
```

Rubi [A] time = 0.114985, antiderivative size = 177, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3bg^4(a+bx)^3}-\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}-\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}+\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}-\frac{}{9bg^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B)/(9*b*g^4*(a + b*x)^3) + (B*d)/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) - (2
*B*d^2)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) - (2*B*d^3*Log[a + b*x])/(3*b*(b*
c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(3*b*g^4*(a + b*
x)^3) + (2*B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^4}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bg^4(a+bx)^3}+\frac{B\int\frac{2(bc-ad)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bg^4(a+bx)^3}+\frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)^2}-\frac{}{(bc\cdot}\right.}{3bg^4}$$

$$= -\frac{2B}{9bg^4(a+bx)^3}+\frac{Bd}{3b(bc-ad)g^4(a+bx)^2}-\frac{2Bd^2}{3b(bc-ad)^2g^4(a+bx)}-\frac{2Bd^3\log(a+bx)}{3b(bc-ad)^3g^4}-$$

Mathematica [A] time = 0.134791, size = 140, normalized size = 0.79

$$-\frac{3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{B\left(6d^2(a+bx)^2(bc-ad)-6d^3(a+bx)^3\log(c+dx)-3d(a+bx)(bc-ad)^2+2(bc-ad)^3+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}}{9bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] -(3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(2*(b*c - a*d)^3 - 3*d*(b
*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*L
og[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))/(b*c - a*d)^3)/(9*b*g^4*(a +
 b*x)^3)
```

Maple [B] time = 0.148, size = 579, normalized size = 3.3

$$-\frac{d^3Ab}{g^4(ad-bc)^3}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-2}+\frac{d^3A}{g^4(ad-bc)^3}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-1}+\frac{d^3Ab^2}{3g^4(ad-bc)^3}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x)
```

```
[Out] -d^3/g^4*A*b/(a*d-b*c)^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2+d^3/g^4*A/(a*d-b*c
)^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+1/3*d^3/g^4*A*b^2/(a*d-b*c)^3/(1/(d*x+c)*
a*d-b*c/(d*x+c)+b)^3-11/9*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B/b/(d*x+
c)^3+1/3*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*b^2*B/(a^3*d^3-3*a^2*b*c*d
^2+3*a*b^2*c^2*d-b^3*c^3)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)-2/3*d^3
/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c
)-5/3*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B/(a*d-b*c)/(d*x+c)^2+d^3/g^4
/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B/(a*d-b*c)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-
b*c/(d*x+c)+b)^2/d^2)+d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B*b/(a^2*d^2-
2*a*b*c*d+b^2*c^2)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 1.23764, size = 648, normalized size = 3.66

$$-\frac{1}{9}B\left(\frac{6b^2d^2x^2+2b^2c^2-7abcd+11a^2d^2-3\left(b^2cd-5abd^2\right)x}{\left(b^6c^2-2ab^5cd+a^2b^4d^2\right)g^4x^3+3\left(ab^5c^2-2a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\left(a^2b^4c^2-2a^3b^3cd+a^4b^2d^2\right)g^4x+\left(a^3b^3c^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x, algorithm="maxi
ma")
```

```
[Out] -1/9*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2
 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 3*log
(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2)
+ a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^
2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*
d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x
```

```
^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 1.07211, size = 869, normalized size = 4.91

$$-\frac{(3A+2B)b^3c^3-9(A+B)ab^2c^2d+9(A+2B)a^2bcd^2-(3A+11B)a^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)x^2-3\left(Bb^3c^2d-6B\right.}{9\left(\left(b^7c^3-3ab^6c^2d+3a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3a^2b^5c^2d+3a^3b^4cd^2-a^4b^3d^3\right)g^4x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/9*((3*A + 2*B)*b^3*c^3 - 9*(A + B)*a*b^2*c^2*d + 9*(A + 2*B)*a^2*b*c*d^2
 - (3*A + 11*B)*a^3*d^3 + 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 - 3*(B*b^3*c^2*
d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 3*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x
^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log((
b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^7*c^3 - 3*a*
b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b
^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*
b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3
*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

Sympy [B] time = 5.49235, size = 677, normalized size = 3.82

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}-\frac{2Bd^3\log\left(x+\frac{-\frac{2Ba^4d^7}{(ad-bc)^3}+\frac{8Ba^3bcd^6}{(ad-bc)^3}-\frac{12Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{8Bab^3c^3d^4}{(ad-bc)^3}+2Bad^4-\frac{2Bb^4c^4d^3}{(ad-bc)^3}+2Bbcd^3}{4Bbd^4}\right)}{3bg^4\left(ad-bc\right)^3}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9
*a*b**3*g**4*x**2 + 3*b**4*g**4*x**3) - 2*B*d**3*log(x + (-2*B*a**4*d**7/(a
*d - b*c)**3 + 8*B*a**3*b*c*d**6/(a*d - b*c)**3 - 12*B*a**2*b**2*c**2*d**5/
(a*d - b*c)**3 + 8*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 - 2*B*b**
4*c**4*d**3/(a*d - b*c)**3 + 2*B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b
```

```
*c)**3) + 2*B*d**3*log(x + (2*B*a**4*d**7/(a*d - b*c)**3 - 8*B*a**3*b*c*d**
6/(a*d - b*c)**3 + 12*B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 8*B*a*b**3*c**
3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 + 2*B*b**4*c**4*d**3/(a*d - b*c)**3 + 2*
B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) - (3*A*a**2*d**2 - 6*A*
a*b*c*d + 3*A*b**2*c**2 + 11*B*a**2*d**2 - 7*B*a*b*c*d + 2*B*b**2*c**2 + 6*
B*b**2*d**2*x**2 + x*(15*B*a*b*d**2 - 3*B*b**2*c*d))/(9*a**5*b*d**2*g**4 -
18*a**4*b**2*c*d*g**4 + 9*a**3*b**3*c**2*g**4 + x**3*(9*a**2*b**4*d**2*g**4
 - 18*a*b**5*c*d*g**4 + 9*b**6*c**2*g**4) + x**2*(27*a**3*b**3*d**2*g**4 -
54*a**2*b**4*c*d*g**4 + 27*a*b**5*c**2*g**4) + x*(27*a**4*b**2*d**2*g**4 -
54*a**3*b**3*c*d*g**4 + 27*a**2*b**4*c**2*g**4))
```

Giac [B] time = 1.33325, size = 639, normalized size = 3.61

$$-\frac{2\,Bd^3\log\left(bx+a\right)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}+\frac{2\,Bd^3\log\left(dx+c\right)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{B\log}{3\left(b^4g^4x^3+3\,ab\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^4,x, algorithm="giac
")
```

```
[Out] -2/3*B*d^3*log(b*x + a)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g^4 + 3*a^2*b^2*c*d^2*
g^4 - a^3*b*d^3*g^4) + 2/3*B*d^3*log(d*x + c)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*
g^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*log((b^2*x^2 + 2*a*b*x +
 a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2
*g^4*x + a^3*b*g^4) - 1/9*(6*B*b^2*d^2*x^2 - 3*B*b^2*c*d*x + 15*B*a*b*d^2*x
 + 3*A*b^2*c^2 + 5*B*b^2*c^2 - 6*A*a*b*c*d - 13*B*a*b*c*d + 3*A*a^2*d^2 + 1
4*B*a^2*d^2)/(b^6*c^2*g^4*x^3 - 2*a*b^5*c*d*g^4*x^3 + a^2*b^4*d^2*g^4*x^3 +
 3*a*b^5*c^2*g^4*x^2 - 6*a^2*b^4*c*d*g^4*x^2 + 3*a^3*b^3*d^2*g^4*x^2 + 3*a^
2*b^4*c^2*g^4*x - 6*a^3*b^3*c*d*g^4*x + 3*a^4*b^2*d^2*g^4*x + a^3*b^3*c^2*g
^4 - 2*a^4*b^2*c*d*g^4 + a^5*b*d^2*g^4)
```

3.127 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=208

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}+\frac{}{6bg^5}$$

```
[Out] -B/(8*b*g^5*(a + b*x)^4) + (B*d)/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2
)/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3)/(2*b*(b*c - a*d)^3*g^5*(a +
 b*x)) + (B*d^4*Log[a + b*x])/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(a +
b*x)^2)/(c + d*x)^2])/(4*b*g^5*(a + b*x)^4) - (B*d^4*Log[c + d*x])/(2*b*(b*
c - a*d)^4*g^5)
```

Rubi [A] time = 0.144397, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{4bg^5(a+bx)^4}+\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}-\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}+\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}+\frac{}{6bg^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] -B/(8*b*g^5*(a + b*x)^4) + (B*d)/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2
)/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3)/(2*b*(b*c - a*d)^3*g^5*(a +
 b*x)) + (B*d^4*Log[a + b*x])/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(a +
b*x)^2)/(c + d*x)^2])/(4*b*g^5*(a + b*x)^4) - (B*d^4*Log[c + d*x])/(2*b*(b*
c - a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(ag+bgx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4bg^5(a+bx)^4}+\frac{B\int\frac{2(bc-ad)}{g^4(a+bx)^5(c+dx)}\,dx}{4bg}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)^5(c+dx)}\,dx}{2bg^5}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4bg^5(a+bx)^4}+\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^5}-\frac{bd}{(bc-ad)^2(a+bx)^4}+\frac{bd^2}{(bc-ad)^3(a+bx)^3}-\frac{b \cdots}{(bc-ad \cdots}\right.}{2bg^5}$$

$$= -\frac{B}{8bg^5(a+bx)^4}+\frac{Bd}{6b(bc-ad)g^5(a+bx)^3}-\frac{Bd^2}{4b(bc-ad)^2g^5(a+bx)^2}+\frac{Bd^3}{2b(bc-ad)^3g^5(a+b \cdots}$$

Mathematica [A] time = 0.2014, size = 162, normalized size = 0.78

$$-\frac{6\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+\frac{B\left(6d^2(a+bx)^2(bc-ad)^2+12d^3(a+bx)^3(ad-bc)+12d^4(a+bx)^4\log(c+dx)+4d(a+bx)(ad-bc)^3+3(bc-ad)^4-12d^4(a+bx)^4\log(a+bx \cdots\right.}{(bc-ad)^4}}{24bg^5(a+bx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] -(6*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (B*(3*(b*c - a*d)^4 + 4*d*(-
(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*d^3*(-(b*c)
 + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(a + b*x)^4*
Log[c + d*x]))/(b*c - a*d)^4)/(24*b*g^5*(a + b*x)^4)
```

Maple [B] time = 0.207, size = 833, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x)
```

```
[Out] -3/2*d^4/g^5*A*b/(a*d-b*c)^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2+d^4/g^5*A/(a*d
-b*c)^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+d^4/g^5*A*b^2/(a*d-b*c)^4/(1/(d*x+c)*
a*d-b*c/(d*x+c)+b)^3-1/4*d^4/g^5*A*b^3/(a*d-b*c)^4/(1/(d*x+c)*a*d-b*c/(d*x+
c)+b)^4-25/24*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B/b/(d*x+c)^4+1/4*d^4
/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*b^3*B/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2
*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)-1
/2*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a
*b^2*c^2*d-b^3*c^3)/(d*x+c)-7/4*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B*b
/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2-13/6*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)^4*B/(a*d-b*c)/(d*x+c)^3+d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B/(a
*d-b*c)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+3/2*d^4/g^5/(1/
(d*x+c)*a*d-b*c/(d*x+c)+b)^4*b*B/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2*ln(e
*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)
^4*B*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)*ln(e*(1/(d*x
+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 1.3979, size = 944, normalized size = 4.54

$$\frac{1}{24}B\left(\frac{12\,b^3d^3x^3 - 3\,b^3c^3 + 13\,ab^2c^2d - 23\,a^2bcd^2 + 25\,a^3}{\left(b^8c^3 - 3\,ab^7c^2d + 3\,a^2b^6cd^2 - a^3b^5d^3\right)g^5x^4 + 4\left(ab^7c^3 - 3\,a^2b^6c^2d + 3\,a^3b^5cd^2 - a^4b^4d^3\right)g^5x^3 + 6\left(a^2b^6c^3 - 3\,a^3b^5\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/24*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*
a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)
*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*
g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)
```

```
*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3
)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5
) - 6*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*
x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((
b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*
g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 +
 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 1.08479, size = 1328, normalized size = 6.38

$$-\frac{3\,(2\,A+B)b^4c^4-8\,(3\,A+2\,B)ab^3c^3d+36\,(A+B)a^2b^2c^2d^2-24\,(A+2\,B)a^3bcd^3+(6\,A+25\,B)a^4d^4-12\left(Bb^4cd^3-Ba\right.}{24\left(\left(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\right)g^5x^4+4\left(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6c^2d^2-4\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/24*(3*(2*A + B)*b^4*c^4 - 8*(3*A + 2*B)*a*b^3*c^3*d + 36*(A + B)*a^2*b^2
*c^2*d^2 - 24*(A + 2*B)*a^3*b*c*d^3 + (6*A + 25*B)*a^4*d^4 - 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 + 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 6*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*B
*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*
b*c*d^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((
b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4
)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*
c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5
*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*
b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4
*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^
4)*g^5)
```

Sympy [B] time = 8.26937, size = 947, normalized size = 4.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(a + b*x)**2/(c + d*x)**2)/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x +
24*a**2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) - B*d**4*l
og(x + (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10
*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c
)**4 - 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a
*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) + B*d**4
*log(x + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 1
0*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*
c)**4 + 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(
a*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) - (6*A*
a**3*d**3 - 18*A*a**2*b*c*d**2 + 18*A*a*b**2*c**2*d - 6*A*b**3*c**3 + 25*B*
a**3*d**3 - 23*B*a**2*b*c*d**2 + 13*B*a*b**2*c**2*d - 3*B*b**3*c**3 + 12*B*
b**3*d**3*x**3 + x**2*(42*B*a*b**2*d**3 - 6*B*b**3*c*d**2) + x*(52*B*a**2*b
*d**3 - 20*B*a*b**2*c*d**2 + 4*B*b**3*c**2*d))/(24*a**7*b*d**3*g**5 - 72*a*
*6*b**2*c*d**2*g**5 + 72*a**5*b**3*c**2*d*g**5 - 24*a**4*b**4*c**3*g**5 + x
**4*(24*a**3*b**5*d**3*g**5 - 72*a**2*b**6*c*d**2*g**5 + 72*a*b**7*c**2*d*g
**5 - 24*b**8*c**3*g**5) + x**3*(96*a**4*b**4*d**3*g**5 - 288*a**3*b**5*c*d
**2*g**5 + 288*a**2*b**6*c**2*d*g**5 - 96*a*b**7*c**3*g**5) + x**2*(144*a**
5*b**3*d**3*g**5 - 432*a**4*b**4*c*d**2*g**5 + 432*a**3*b**5*c**2*d*g**5 -
144*a**2*b**6*c**3*g**5) + x*(96*a**6*b**2*d**3*g**5 - 288*a**5*b**3*c*d**2
*g**5 + 288*a**4*b**4*c**2*d*g**5 - 96*a**3*b**5*c**3*g**5))
```

Giac [B] time = 1.44465, size = 566, normalized size = 2.72

$$-\frac{Bd^4 \log\left(-\frac{bcg}{bgx+ag} + \frac{adg}{bgx+ag} - d\right)}{2\left(b^5c^4g^5 - 4\,ab^4c^3dg^5 + 6\,a^2b^3c^2d^2g^5 - 4\,a^3b^2cd^3g^5 + a^4bd^4g^5\right)} + \frac{Bd^3}{2\left(b^3c^3g^3 - 3\,ab^2c^2dg^3 + 3\,a^2bcd^2g^3 - a^3d^3g^3\right)\left(bgx\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(b*g*x+a*g)^5,x, algorithm="giac
")
```

```
[Out] -1/2*B*d^4*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g) - d)/(b^5*c^4*g^5
 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*
d^4*g^5) + 1/2*B*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3
- a^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 1/4*B*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a
^2*d^2*g)*(b*g*x + a*g)^2*b*g^2) - 1/4*B*log(b^2/(b^2*c^2*g^2/(b*g*x + a*g)
```

```
^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*
g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))/((b*g*x + a*g)^4*b*g) + 1
/6*B*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2) - 1/8*(2*A*b^3*g^3 + 3*B*b^3*g^3
)/((b*g*x + a*g)^4*b^4*g^4)
```

3.128 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=377

$$\frac{8B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{5bd^5}+\frac{2Bg^4(bc-ad)^5\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+6A+25B\right)}{15bd^5}+\frac{2Bg^4(a+bx)(bc}{}$$

```
[Out] -(B*(b*c - a*d)*g^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(
5*b*d) + (g^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(5*b)
 + (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(2*A + B + 2*B*Log[(e*(a + b*x)^2)/(c
 + d*x)^2]))/(15*b*d^2) - (B*(b*c - a*d)^3*g^4*(a + b*x)^2*(6*A + 7*B + 6*B
*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(15*b*d^3) + (2*B*(b*c - a*d)^4*g^4*(a
+ b*x)*(6*A + 13*B + 6*B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(15*b*d^4) + (2
*B*(b*c - a*d)^5*g^4*(6*A + 25*B + 6*B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Lo
g[(b*c - a*d)/(b*(c + d*x))])/(15*b*d^5) + (8*B^2*(b*c - a*d)^5*g^4*PolyLog
[2, (d*(a + b*x))/(b*(c + d*x))])/(5*b*d^5)
```

Rubi [A] time = 0.871967, antiderivative size = 569, normalized size of antiderivative = 1.51, number of steps used = 28, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}-\frac{4Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{5bd^5}-\frac{2Bg^4(a+bx)^2(bc-ad)^3\left(B\right.}{5bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (4*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (26*B^2*(b*c - a*d)^4*g^4*x)/(15*d^4)
 - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(15*b*d^3) + (2*B^2*(b*c - a*d)^2*
g^4*(a + b*x)^3)/(15*b*d^2) + (4*B^2*(b*c - a*d)^4*g^4*(a + b*x)*Log[(e*(a
+ b*x)^2)/(c + d*x)^2])/(5*b*d^4) - (2*B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*b*d^3) + (4*B*(b*c - a*d)^2*g^4*(a
 + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(15*b*d^2) - (B*(b*c -
a*d)*g^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*b*d) + (g
^4*(a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(5*b) - (10*B^2*
(b*c - a*d)^5*g^4*Log[c + d*x])/(3*b*d^5) + (8*B^2*(b*c - a*d)^5*g^4*Log[-(
(d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(5*b*d^5) - (4*B*(b*c - a*d)^5*g^
4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(5*b*d^5) - (4*B^2
```

```
*(b*c - a*d)^5*g^4*Log[c + d*x]^2)/(5*b*d^5) + (8*B^2*(b*c - a*d)^5*g^4*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)])/(5*b*d^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{(2B)\int \frac{2(bc-ad)g^5(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{c+dx}}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int \frac{(a+bx)^4\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.}{c+dx}}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3\left(A+B\log\right.}{d^4}\right.}{}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int(a+bx)^3\left(A+B\,\mathrm{l}\right.}{5d}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} - \frac{2B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5bd^3} + \frac{4B}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{4B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{5bd^4} - \frac{2B(bc-ad)}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{4B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{5bd^4} - \frac{2B(bc-ad)}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2B}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2B}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2B}{}$$

$$= \frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2B}{}$$

Mathematica [A] time = 0.465664, size = 523, normalized size = 1.39

$$g^4\left(\frac{B(bc-ad)\left(12B(bc-ad)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-6d^2(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)+4d^3(a+bx)^3(bc-ad)\left(B\log\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (B*(b*c - a*
d)*(12*A*b*d*(b*c - a*d)^3*x + 12*B*d*(b*c - a*d)^3*(a + b*x)*Log[(e*(a + b
*x)^2)/(c + d*x)^2] - 6*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2]) + 4*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(a + b*x)
^2)/(c + d*x)^2]) - 3*d^4*(a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]) - 24*B*(b*c - a*d)^4*Log[c + d*x] - 12*(b*c - a*d)^4*(A + B*Log[(e*(a +
 b*x)^2)/(c + d*x)^2])*Log[c + d*x] + 4*B*(b*c - a*d)^2*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + B*(b*c - a*d)*(6*b*d*
(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 + 2*d^3*(a + b*x)^3 - 6*
(b*c - a*d)^3*Log[c + d*x]) + 12*B*(b*c - a*d)^3*(b*d*x + (-(b*c) + a*d)*Lo
g[c + d*x]) + 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^
5)))/(5*b)
```

Maple [F] time = 1.7, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^4 \left(A + B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 2.08981, size = 3578, normalized size = 9.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*
x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/
b - 2*c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d
*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
+ c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x
/(b*d))*A*B*a^3*b*g^4 + 4*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*
a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 2/3*(3*x^4*log(b^2*e*x^
2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(
d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4
 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*
c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/15*(6*x^5*log(b^2*e*x^2/(d^2
*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^
2 + 2*c*d*x + c^2)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x + c)/d^5 - (
3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*
c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 +
 A^2*a^4*g^4*x - 2/15*((6*g^4*log(e) + 25*g^4)*b^4*c^5 - (30*g^4*log(e) + 1
13*g^4)*a*b^3*c^4*d + 4*(15*g^4*log(e) + 49*g^4)*a^2*b^2*c^3*d^2 - 12*(5*g^
4*log(e) + 13*g^4)*a^3*b*c^2*d^3 + 6*(5*g^4*log(e) + 8*g^4)*a^4*c*d^4)*B^2*
log(d*x + c)/d^5 - 8/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^
2*g^4 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^5) + 1/15*(3*B^2*b^5*d^5*g^4*x^5*log(e)^2 - 3*(b^5*c*d^4*g^4*log
(e) - (5*g^4*log(e)^2 + g^4*log(e))*a*b^4*d^5)*B^2*x^4 + 2*((2*g^4*log(e) +
 g^4)*b^5*c^2*d^3 - 2*(5*g^4*log(e) + g^4)*a*b^4*c*d^4 + (15*g^4*log(e)^2 +
 8*g^4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 - ((6*g^4*log(e) + 7*g^4)*b^5*c^3
*d^2 - 3*(10*g^4*log(e) + 9*g^4)*a*b^4*c^2*d^3 + 3*(20*g^4*log(e) + 11*g^4)
*a^2*b^3*c*d^4 - (30*g^4*log(e)^2 + 36*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^
2*x^2 + (2*(6*g^4*log(e) + 13*g^4)*b^5*c^4*d - 2*(30*g^4*log(e) + 59*g^4)*a
*b^4*c^3*d^2 + 12*(10*g^4*log(e) + 17*g^4)*a^2*b^3*c^2*d^3 - 2*(60*g^4*log(
e) + 79*g^4)*a^3*b^2*c*d^4 + (15*g^4*log(e)^2 + 48*g^4*log(e) + 46*g^4)*a^4
*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*
a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x +
B^2*a^5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5
*g^4*x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*
a^4*b*d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4
 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 + 2*(6*B
```

```
^2*b^5*d^5*g^4*x^5*log(e) - 3*(b^5*c*d^4*g^4 - (10*g^4*log(e) + g^4)*a*b^4*
d^5)*B^2*x^4 + 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + (15*g^4*log(e) + 4*
g^4)*a^2*b^3*d^5)*B^2*x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a
^2*b^3*c*d^4*g^4 - 2*(5*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 6*(2*b^5
*c^4*d*g^4 - 10*a*b^4*c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d
^4*g^4 + (5*g^4*log(e) + 8*g^4)*a^4*b*d^5)*B^2*x + (12*a*b^4*c^4*d*g^4 - 54
*a^2*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 + (6*g^4
*log(e) + 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) - 2*(6*B^2*b^5*d^5*g^4*x^5*log
(e) - 3*(b^5*c*d^4*g^4 - (10*g^4*log(e) + g^4)*a*b^4*d^5)*B^2*x^4 + 4*(b^5*
c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 + (15*g^4*log(e) + 4*g^4)*a^2*b^3*d^5)*B^2*
x^3 - 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 - 2*(
5*g^4*log(e) + 3*g^4)*a^3*b^2*d^5)*B^2*x^2 + 6*(2*b^5*c^4*d*g^4 - 10*a*b^4*
c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d^4*g^4 + (5*g^4*log(e)
 + 8*g^4)*a^4*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*
x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b
*d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \left(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2a^2b^2g^4x^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((b^2*e*x^2 + 2*a
*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a
*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log
((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{4}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^4*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.129 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 \, dx$

Optimal. Leaf size=319

$$-\frac{2B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^4}-\frac{Bg^3(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(3B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+3A+11B\right)}{3bd^4}-\frac{Bg^3(a+bx)(bc-}{}$$

```
[Out] -(B*(b*c - a*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(
3*b*d) + (g^3*(a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(4*b)
 + (B*(b*c - a*d)^2*g^3*(a + b*x)^2*(3*A + 2*B + 3*B*Log[(e*(a + b*x)^2)/(c
 + d*x)^2]))/(6*b*d^2) - (B*(b*c - a*d)^3*g^3*(a + b*x)*(3*A + 5*B + 3*B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*d^3) - (B*(b*c - a*d)^4*g^3*(3*A + 11
*B + 3*B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[(b*c - a*d)/(b*(c + d*x))])/
(3*b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(b*d^4)
```

Rubi [A] time = 0.759814, antiderivative size = 470, normalized size of antiderivative = 1.47, number of steps used = 24, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{2B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^4}+\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd^4}+\frac{Bg^3(a+bx)^2(bc-ad)^2\left(B\log\right.}{2bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)^3*g^3*x)/d^3) - (5*B^2*(b*c - a*d)^3*g^3*x)/(3*d^3) + (B
^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/(3*b*d^2) - (B^2*(b*c - a*d)^3*g^3*(a + b
*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b*d^3) + (B*(b*c - a*d)^2*g^3*(a + b
*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*b*d^2) - (B*(b*c - a*d)*
g^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*d) + (g^3*(a
 + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(4*b) + (11*B^2*(b*c
- a*d)^4*g^3*Log[c + d*x])/(3*b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*Log[-((d*(a
 + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^4) + (B*(b*c - a*d)^4*g^3*(A + B*
Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*d^4) + (B^2*(b*c - a*d)^
4*g^3*Log[c + d*x]^2)/(b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c +
 d*x))/(b*c - a*d)])/(b*d^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{B\int \frac{2(bc-ad)g^4(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{c+dx}\, d}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3\left(A+B\log\left(\frac{e(a+bx}{(c+dx}\right.\right.}{c+dx}}{b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2\left(A+B\log\left(\frac{e(a}{(c}\right.\right.}{d^3}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int (a+bx)^2\left(A+B\,\mathrm{lo}\right.}{d}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} + \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2bd^2} - \frac{B(bc}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd^3} + \frac{B(bc-ad)^2g}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd^3} + \frac{B(bc-ad)^2g}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} - \frac{B^2(b}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} - \frac{B^2(b}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} - \frac{B^2(b}{}$$

$$= -\frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} - \frac{B^2(b}{}$$

Mathematica [A] time = 0.327971, size = 402, normalized size = 1.26

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{2B(bc-ad)\left(6B(bc-ad)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2d^3(a+bx)^3\left(B\log\left(\cdots\right.\right.\right.}{\cdots}\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (2*B*(b*c -
a*d)*(6*A*b*d*(b*c - a*d)^2*x + 6*B*d*(b*c - a*d)^2*(a + b*x)*Log[(e*(a + b
*x)^2)/(c + d*x)^2] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(a + b
*x)^2)/(c + d*x)^2]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]) - 12*B*(b*c - a*d)^3*Log[c + d*x] - 6*(b*c - a*d)^3*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[c + d*x] + 2*B*(b*c - a*d)*(2*b*d*(b*c - a*d)*
x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) + 6*B*(b*c - a*d)^2*(b*
d*x + (-(b*c) + a*d)*Log[c + d*x]) + 6*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])))/(3*d^4)))/(4*b)
```

Maple [F] time = 1.577, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{3}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 1.99019, size = 2630, normalized size = 8.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) +
 a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d
)*A*B*a^3*g^3 + 3*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/
(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*
x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3
+ 2*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c
*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2
*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)
/(b^2*d^2))*A*B*a*b^2*g^3 + 1/6*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2
*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d
^3))*A*B*b^3*g^3 + A^2*a^3*g^3*x + 1/3*((3*g^3*log(e) + 11*g^3)*b^3*c^4 - 2
*(6*g^3*log(e) + 19*g^3)*a*b^2*c^3*d + 9*(2*g^3*log(e) + 5*g^3)*a^2*b*c^2*d
^2 - 6*(2*g^3*log(e) + 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 2*(b^4*c^4*
g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d
^4*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 - 4*(
b^4*c*d^3*g^3*log(e) - (3*g^3*log(e)^2 + g^3*log(e))*a*b^3*d^4)*B^2*x^3 + 2
*((3*g^3*log(e) + 2*g^3)*b^4*c^2*d^2 - 4*(3*g^3*log(e) + g^3)*a*b^3*c*d^3 +
 (9*g^3*log(e)^2 + 9*g^3*log(e) + 2*g^3)*a^2*b^2*d^4)*B^2*x^2 - 4*((3*g^3*l
og(e) + 5*g^3)*b^4*c^3*d - (12*g^3*log(e) + 17*g^3)*a*b^3*c^2*d^2 + (18*g^3
*log(e) + 19*g^3)*a^2*b^2*c*d^3 - (3*g^3*log(e)^2 + 9*g^3*log(e) + 7*g^3)*a
^3*b*d^4)*B^2*x + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2
*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a
)^2 + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4
*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2
*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 + 4*(3*B^2*b^4*d^
4*g^3*x^4*log(e) - 2*(b^4*c*d^3*g^3 - (6*g^3*log(e) + g^3)*a*b^3*d^4)*B^2*x
^3 + 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 + 3*(2*g^3*log(e) + g^3)*a^2*b^
2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g
^3 - (2*g^3*log(e) + 3*g^3)*a^3*b*d^4)*B^2*x - (6*a*b^3*c^3*d*g^3 - 21*a^2*
b^2*c^2*d^2*g^3 + 26*a^3*b*c*d^3*g^3 - (3*g^3*log(e) + 11*g^3)*a^4*d^4)*B^2
)*log(b*x + a) - 4*(3*B^2*b^4*d^4*g^3*x^4*log(e) - 2*(b^4*c*d^3*g^3 - (6*g^
3*log(e) + g^3)*a*b^3*d^4)*B^2*x^3 + 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3
 + 3*(2*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^3*d*g^3 - 4*a*b^3
*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 - (2*g^3*log(e) + 3*g^3)*a^3*b*d^4)*B^2*
x + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c)
)/(b*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\frac{b^2}{\ldots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2
*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*
log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 \left(B\log\left(\frac{\left(bx + a\right)^2 e}{\left(dx + c\right)^2}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.130 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx$

Optimal. Leaf size=255

$$\frac{8B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}+\frac{4Bg^2(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A+3B\right)}{3bd^3}+\frac{4Bg^2(a+bx)(bc-ad)^{\cdot}}{}$$

```
[Out] (-2*B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))
/(3*b*d) + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(3*
b) + (4*B*(b*c - a*d)^2*g^2*(a + b*x)*(A + B + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(3*b*d^2) + (4*B*(b*c - a*d)^3*g^2*(A + 3*B + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2])*Log[(b*c - a*d)/(b*(c + d*x))])/(3*b*d^3) + (8*B^2*(b*c - a
*d)^3*g^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b*d^3)
```

Rubi [A] time = 0.621454, antiderivative size = 397, normalized size of antiderivative = 1.56, number of steps used = 20, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}-\frac{4Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3bd^3}+\frac{4ABg^2x(bc-ad)^2}{3d^2}-\frac{2Bg^2(a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (4*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (4*B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) +
 (4*B^2*(b*c - a*d)^2*g^2*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(3*b*
d^2) - (2*B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2]))/(3*b*d) + (g^2*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^
2)/(3*b) - (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (8*B^2*(b*c - a
*d)^3*g^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (4*B*
(b*c - a*d)^3*g^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(3
*b*d^3) - (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x]^2)/(3*b*d^3) + (8*B^2*(b*c
- a*d)^3*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b} - \frac{(2B)\int \frac{2(bc-ad)g^3(a+bx)^2\left(A+B\log\left(\frac{e(a+bx}{(c+dx)}\right.\right.}{c+dx}}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int \frac{(a+bx)^2\left(A+B\log\left(\frac{e(}{(c}\right.\right.}{c+dx}}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)\left(A+B\log\right.}{d^2}\right.}{}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int(a+bx)\left(A+B\right.}{3d}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} - \frac{2B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3bd} + \frac{g^2}{}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bd^2} - \frac{2B(bc-ad}{}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3bd^2} - \frac{2B(bc-ad}{}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e}{(}\right.}{3bd^2}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e}{(}\right.}{3bd^2}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e}{(}\right.}{3bd^2}$$

$$= \frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e}{(}\right.}{3bd^2}$$

Mathematica [A] time = 0.220749, size = 298, normalized size = 1.17

$$g^2\left(\frac{2B(bc-ad)\left(2B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-d^2(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-2(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.\right.}{d^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*(b*c -
a*d)*(2*A*b*d*(b*c - a*d)*x + 2*B*d*(b*c - a*d)*(a + b*x)*Log[(e*(a + b*x)^
2)/(c + d*x)^2] - d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
- 4*B*(b*c - a*d)^2*Log[c + d*x] - 2*(b*c - a*d)^2*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2])*Log[c + d*x] + 2*B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log
[c + d*x]) + 2*B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(
3*b)
```

Maple [F] time = 1.503, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\left(bx+a\right)^2}{\left(dx+c\right)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 1.71885, size = 1790, normalized size = 7.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d
*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
+ c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log
(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2)
+ a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x
 + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 2/3*(x^3*log(b^2*e*x^2/(d^
2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x
^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 +
A^2*a^2*g^2*x - 4/3*((g^2*log(e) + 3*g^2)*b^2*c^3 - (3*g^2*log(e) + 7*g^2)*
a*b*c^2*d + (3*g^2*log(e) + 4*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 8/3*(b
^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 - (2*b^3*c*d^2*g^2*log(e)
 - (3*g^2*log(e)^2 + 2*g^2*log(e))*a*b^2*d^3)*B^2*x^2 + (4*(g^2*log(e) + g^
2)*b^3*c^2*d - 4*(3*g^2*log(e) + 2*g^2)*a*b^2*c*d^2 + (3*g^2*log(e)^2 + 8*g
^2*log(e) + 4*g^2)*a^2*b*d^3)*B^2*x + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*
d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + 4*(
B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^
3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 + 4*
(B^2*b^3*d^3*g^2*x^3*log(e) - (b^3*c*d^2*g^2 - (3*g^2*log(e) + g^2)*a*b^2*d
^3)*B^2*x^2 + (2*b^3*c^2*d*g^2 - 6*a*b^2*c*d^2*g^2 + (3*g^2*log(e) + 4*g^2)
*a^2*b*d^3)*B^2*x + (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 + (g^2*log(e) +
3*g^2)*a^3*d^3)*B^2)*log(b*x + a) - 4*(B^2*b^3*d^3*g^2*x^3*log(e) - (b^3*c*
d^2*g^2 - (3*g^2*log(e) + g^2)*a*b^2*d^3)*B^2*x^2 + (2*b^3*c^2*d*g^2 - 6*a*
b^2*c*d^2*g^2 + (3*g^2*log(e) + 4*g^2)*a^2*b*d^3)*B^2*x + 2*(B^2*b^3*d^3*g^
2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*
log(b*x + a))*log(d*x + c))/(b*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 + 2\left(ABb^2g\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*
x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^
```

```
2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^2 \left(B \log\left(\frac{(bx + a)^2 e}{(dx + c)^2}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.131 $\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=188

$$-\frac{4B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}-\frac{2Bg(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A+2B\right)}{bd^2}-\frac{2Bg(a+bx)(bc-ad)}{b}$$

```
[Out] (-2*B*(b*c - a*d)*g*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*
d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(2*b) - (2*
B*(b*c - a*d)^2*g*(A + 2*B + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[(b*c -
 a*d)/(b*(c + d*x))])/(b*d^2) - (4*B^2*(b*c - a*d)^2*g*PolyLog[2, (d*(a + b
*x))/(b*(c + d*x))])/(b*d^2)
```

Rubi [A] time = 0.492536, antiderivative size = 291, normalized size of antiderivative = 1.55, number of steps used = 16, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{4B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}+\frac{2Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g*x)/d - (2*B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x
)^2)/(c + d*x)^2])/(b*d) + (g*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])^2)/(2*b) + (4*B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) - (4*B^2*(b
*c - a*d)^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^2) + (2*
B*(b*c - a*d)^2*g*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b
*d^2) + (2*B^2*(b*c - a*d)^2*g*Log[c + d*x]^2)/(b*d^2) - (4*B^2*(b*c - a*d)
^2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*d^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{B\int \frac{2(bc-ad)g^2(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{c+dx}dx}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int \frac{(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{c+dx}}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{d} + \right.}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{d}$$

$$= -\frac{2AB(bc-ad)gx}{d} + \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2b} + \frac{2B(bc-ad)^2g\left(A\right.}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a+bx)^2\left(A+\right.}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a+bx)^2\left(A+\right.}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a+bx)^2\left(A+\right.}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a+bx)^2\left(A+\right.}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a+bx)^2\left(A+\right.}{}$$

$$= -\frac{2AB(bc-ad)gx}{d} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{bd} + \frac{g(a+bx)^2\left(A+\right.}{}$$

Mathematica [A] time = 0.173694, size = 207, normalized size = 1.1

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{4B(bc-ad)\left(B(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-(bc-ad)\log(c+dx)\left(B\log\ldots\right.\right.}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (4*B*(b*c - a*
d)*(A*b*d*x + B*d*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2] - 2*B*(b*c - a
*d)*Log[c + d*x] - (b*c - a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log
[c + d*x] + B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^2))/(2*b)
```

Maple [F] time = 1.273, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)\left(A+B\ln\left(\frac{e\left(bx+a\right)^2}{\left(dx+c\right)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 1.58367, size = 981, normalized size = 5.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/
(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x
```

```
+ a)/b - 2*c*log(d*x + c)/d)*A*B*a*g + (x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*
x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x +
 c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/
(b*d))*A*B*b*g + A^2*a*g*x + 2*((g*log(e) + 2*g)*b*c^2 - 2*(g*log(e) + g)*a
*c*d)*B^2*log(d*x + c)/d^2 + 4*(b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b
*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*
d)))*B^2/(b*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 - 2*(2*b^2*c*d*g*log(e)
- (g*log(e)^2 + 2*g*log(e))*a*b*d^2)*B^2*x + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a)^2 + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x - (b^2*c^2*g - 2*a*b*c*d*g)*B^2)*log(d*x + c)^2 + 4*(B^2*b^2*d^2
*g*x^2*log(e) + 2*((g*log(e) + g)*a*b*d^2 - b^2*c*d*g)*B^2*x + ((g*log(e) +
 2*g)*a^2*d^2 - 2*a*b*c*d*g)*B^2)*log(b*x + a) - 4*(B^2*b^2*d^2*g*x^2*log(e
) + 2*((g*log(e) + g)*a*b*d^2 - b^2*c*d*g)*B^2*x + 2*(B^2*b^2*d^2*g*x^2 + 2
*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b^2*e*x^2 + 2*a*b
*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((b
^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.132 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=132

$$\frac{4B\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg}+\frac{8B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{bg}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{bg}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2*Log[1 - (b*(c + d*x))/(d*(a +
 b*x))])/(b*g)) + (4*B*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/(b*g) + (8*B^2*PolyLog[3, (b*(c + d*x))/(d*(a
 + b*x))])/(b*g)
```

Rubi [B] time = 4.14106, antiderivative size = 749, normalized size of antiderivative = 5.67, number of steps used = 46, number of rules used = 23, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.676, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2440, 2434, 2433, 2375, 2317, 2374, 6589, 2499, 2302, 30, 2396}

$$\frac{4AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}-\frac{4B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+\log\left((a+bx)^2\right)+\log\left(\frac{1}{(c+dx)^2}\right)\right)}{bg}-\frac{8B^2\text{PolyLo}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (-2*A*B*Log[g*(a + b*x)]^2)/(b*g) + (4*B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (4
*B^2*Log[g*(a + b*x)]^2*Log[-c - d*x])/(b*g) + (4*B^2*Log[g*(a + b*x)]*Log[
(a + b*x)^2]*Log[-c - d*x])/(b*g) - (B^2*Log[(a + b*x)^2]^2*Log[-c - d*x])/
(b*g) + (B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^(-2)]^2)/(b*g)
 - (B^2*Log[g*(a + b*x)]*Log[(c + d*x)^(-2)]^2)/(b*g) + (4*B^2*Log[g*(a + b
*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g) + (B^2*Log[(a + b*x)^2]^2*Log[
(b*(c + d*x))/(b*c - a*d)])/(b*g) + ((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2
])^2*Log[a*g + b*g*x])/(b*g) + (4*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*
g + b*g*x])/(b*g) - (4*B^2*(Log[(a + b*x)^2] + Log[(c + d*x)^(-2)] - Log[(e
*(a + b*x)^2)/(c + d*x)^2])*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]
)/(b*g) - (2*B^2*Log[(e*(a + b*x)^2)/(c + d*x)^2]*Log[a*g + b*g*x]^2)/(b*g)
 - (4*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g) + (4*A*B
*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (4*B^2*Log[(a + b*x)^2]*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (4*B^2*(Log[(a + b*x)^2]
```

```
+ Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*PolyLog[2, -((d*(
a + b*x))/(b*c - a*d))])/(b*g) - (4*B^2*Log[(c + d*x)^(-2)]*PolyLog[2, (b*(
c + d*x))/(b*c - a*d)])/(b*g) - (8*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*
d))])/(b*g) - (8*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
```

```
b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{e(a+bx)^2}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{(a+bx)^2}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{2(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \left(\frac{d\left(-A-B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{(bc-ad)(c+dx)} + \right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{(4Bd)\int}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \left(\frac{A\log(ag+bgx)}{a+bx} + \frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\log(ag+bgx)}{a+bx}\right)}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4AB)\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{\left(4B^2\right)\int \frac{\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\log}{a+bx}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} + \frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{2B^2\log\left(\frac{e(a}{(c}\right.}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(ag+bgx)}{bg} + \frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} - \frac{4B^2\left(\log\left((a\right.\right.}{}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log(g(a+bx))\log\left((a+bx)^2\right)\log(-c-dx)}{bg} - \frac{B^2\log(g(a+}{}$$

$$= -\frac{2AB\log^2(g(a+bx))}{bg} + \frac{4B^2\log(g(a+bx))\log\left((a+bx)^2\right)\log(-c-dx)}{bg} + \frac{B^2\log\left(-\frac{d(a}{bc}\right.}{}$$

Mathematica [A] time = 0.327194, size = 257, normalized size = 1.95

$$\frac{-4AB\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+4B^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+8B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)+A^2\log(a+bx)+2AB\,\mathrm{l}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (2*A*B*Log[a/b + x]^2 + A^2*Log[a + b*x] - 4*A*B*Log[a/b + x]*Log[a + b*x]
+ 4*A*B*Log[c/d + x]*Log[a + b*x] - 4*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(-
(b*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(a + b*x)^2)/(c + d*x)^2] - B^2*L
og[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x)^2)/(c + d*x)^2]^2 - 4*A*B
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 4*B^2*Log[(e*(a + b*x)^2)/(c + d*x
)^2]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 8*B^2*PolyLog[3, (b*(c + d*x
))/(d*(a + b*x))])/(b*g)
```

Maple [F] time = 1.374, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{4\,B^2\log\left(bx+a\right)\log\left(dx+c\right)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log\left(e\right)^2+2\,ABbc\log\left(e\right)+4\left(B^2bdx+B^2bc\right)\log\left(bx+a\right)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x, algorithm="maxi
ma")
```

```
[Out] 4*B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - inte
grate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + 4*(B^2*b*d*x + B^2*b*c)*log(b
*x + a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) - 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x + 2*(2*B^2*b*d*x + (b*c + a*d)*B^2)*l
og(b*x + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x),
 x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g),x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(b*g*x + a*g), x)
```

3.133 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=130

$$-\frac{4B(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^2(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}-\frac{8B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] (-8*B^2*(c + d*x))/((b*c - a*d)*g^2*(a + b*x)) - (4*B*(c + d*x)*(A + B*Log[
(e*(a + b*x)^2)/(c + d*x)^2]))/((b*c - a*d)*g^2*(a + b*x)) - ((c + d*x)*(A
+ B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/((b*c - a*d)*g^2*(a + b*x))
```

Rubi [C] time = 0.888483, antiderivative size = 480, normalized size of antiderivative = 3.69, number of steps used = 26, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{8B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{4Bd\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg^2(bc-ad)}-\frac{4B\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{bg^2(a+bx}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-8*B^2)/(b*g^2*(a + b*x)) - (8*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
4*B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) - (4*B*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2]))/(b*g^2*(a + b*x)) - (4*B*d*Log[a + b*x]*(A + B*Log[(e*(a
+ b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(a + b*x)^2)/(
c + d*x)^2])^2/(b*g^2*(a + b*x)) + (8*B^2*d*Log[c + d*x])/(b*(b*c - a*d)*g^
2) - (8*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d
)*g^2) + (4*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*(
b*c - a*d)*g^2) + (4*B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (8*B^2*d*L
og[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) - (8*B^2*d*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (8*B^2*d*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)^2(a+bx)} + \frac{d^2(\ldots}{\ldots}\right.}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(4Bd)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{(bc-ad)g^2} + \frac{(4B\ldots}{\ldots}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx}{(c+dx}\right.\right.}{bg^2(a+bx)}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx}{(c+dx}\right.\right.}{bg^2(a+bx)}$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{\left(A+B\log\left(\frac{e(a+bx}{(c+dx}\right.\right.}{bg^2(a+bx)}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\right.}{b(bc-ad)g}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\log(a+bx)\left(A+B\right.}{b(bc-ad)g}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\ldots}{\ldots}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} - \frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^2(a+bx)} - \frac{4Bd\ldots}{\ldots}$$

Mathematica [C] time = 0.450889, size = 321, normalized size = 2.47

$$-\frac{4B\left(-Bd(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(a+bx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+(bc}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (4*B*((b*c - a*d)*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]) + d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2]) - d*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2])*Log[c + d*x] + 2*B*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)
*Log[c + d*x]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a
+ b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

Maple [B] time = 0.09, size = 357, normalized size = 2.8

$$\frac{dA^2}{g^2(ad-bc)}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-1}-8\,\frac{dB^2}{bg^2(dx+c)}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^{-1}+4\,\frac{dB^2}{g^2(ad-bc)}\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x)
```

```
[Out] d/g^2*A^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)/(a*d-b*c)-8*d/g^2/(1/(d*x+c)*a*d-b*
c/(d*x+c)+b)*B^2/b/(d*x+c)+4*d/g^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*B^2/(a*d-b
*c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d/g^2/(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)*B^2/(a*d-b*c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)^2-4*d/g^2/(1
/(d*x+c)*a*d-b*c/(d*x+c)+b)*A*B/b/(d*x+c)+2*d/g^2/(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)*A*B/(a*d-b*c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 1.4819, size = 775, normalized size = 5.96

$$-4\left(\left(\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{\left(b^2c-abd\right)g^2}-\frac{d\log(dx+c)}{\left(b^2c-abd\right)g^2}\right)\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x, algorithm="ma
xima")
```

```
[Out] -4*((1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log
(d*x + c)/((b^2*c - a*b*d)*g^2))*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) +
2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - ((
b*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d
- 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a
))*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))
*B^2 - 2*A*B*(log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2
+ 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^2*g^2*x + a*b*g^2) +
 2/(b^2*g^2*x + a*b*g^2) + 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - 2*d*log
(d*x + c)/((b^2*c - a*b*d)*g^2)) - B^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c
^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)
)^2/(b^2*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 0.998379, size = 416, normalized size = 3.2

$$-\frac{\left(A^2+4\,AB+8\,B^2\right)bc-\left(A^2+4\,AB+8\,B^2\right)ad+\left(B^2bdx+B^2bc\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(\left(AB+2\,B^2\right)bdx+\left(AB+2\right.\right.}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x, algorithm="fr
icas")
```

```
[Out] -((A^2 + 4*A*B + 8*B^2)*b*c - (A^2 + 4*A*B + 8*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(
(A*B + 2*B^2)*b*d*x + (A*B + 2*B^2)*b*c)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e
)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d
)*g^2)
```

Sympy [B] time = 3.79672, size = 452, normalized size = 3.48

$$-\frac{4Bd\left(A+2B\right)\log\left(x+\frac{4ABad^2+4ABbcd+8B^2ad^2+8B^2bcd-\frac{4Ba^2d^3(A+2B)}{ad-bc}+\frac{8Babcd^2(A+2B)}{ad-bc}-\frac{4Bb^2c^2d(A+2B)}{ad-bc}}{8ABbd^2+16B^2bd^2}\right)}{bg^2\left(ad-bc\right)}+\frac{4Bd\left(A+2B\right)\log\left(x+\frac{4ABad^2+\cdots}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**2,x)
```

```
[Out] -4*B*d*(A + 2*B)*log(x + (4*A*B*a*d**2 + 4*A*B*b*c*d + 8*B**2*a*d**2 + 8*B*
*2*b*c*d - 4*B*a**2*d**3*(A + 2*B)/(a*d - b*c) + 8*B*a*b*c*d**2*(A + 2*B)/(
a*d - b*c) - 4*B*b**2*c**2*d*(A + 2*B)/(a*d - b*c))/(8*A*B*b*d**2 + 16*B**2
*b*d**2))/(b*g**2*(a*d - b*c)) + 4*B*d*(A + 2*B)*log(x + (4*A*B*a*d**2 + 4*
A*B*b*c*d + 8*B**2*a*d**2 + 8*B**2*b*c*d + 4*B*a**2*d**3*(A + 2*B)/(a*d - b
*c) - 8*B*a*b*c*d**2*(A + 2*B)/(a*d - b*c) + 4*B*b**2*c**2*d*(A + 2*B)/(a*d
 - b*c))/(8*A*B*b*d**2 + 16*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B -
4*B**2)*log(e*(a + b*x)**2/(c + d*x)**2)/(a*b*g**2 + b**2*g**2*x) + (B**2*c
 + B**2*d*x)*log(e*(a + b*x)**2/(c + d*x)**2)**2/(a**2*d*g**2 - a*b*c*g**2
+ a*b*d*g**2*x - b**2*c*g**2*x) - (A**2 + 4*A*B + 8*B**2)/(a*b*g**2 + b**2*
g**2*x)
```

Giac [B] time = 1.47634, size = 510, normalized size = 3.92

$$-\left(\frac{B^2d}{b^2cg^2 - abdg^2} + \frac{B^2}{\left(bgx + ag\right)bg}\right)\log\left(\frac{b^2}{\frac{b^2c^2g^2}{\left(bgx+ag\right)^2} - \frac{2\,abcdg^2}{\left(bgx+ag\right)^2} + \frac{a^2d^2g^2}{\left(bgx+ag\right)^2} + \frac{2\,bcdg}{bgx+ag} - \frac{2\,ad^2g}{bgx+ag} + d^2}\right)^2 + \frac{4\left(ABd + 3\,B^2d\right)\log}{b^2cg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^2,x, algorithm="gi
ac")
```

```
[Out] -(B^2*d/(b^2*c*g^2 - a*b*d*g^2) + B^2/((b*g*x + a*g)*b*g))*log(b^2/(b^2*c^2
*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x +
 a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))^2 + 4*(
A*B*d + 3*B^2*d)*log(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x + a*g) + d)/(b^2*c*
g^2 - a*b*d*g^2) - 2*(A*B + 3*B^2)*log(b^2/(b^2*c^2*g^2/(b*g*x + a*g)^2 - 2
*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*g/(b*g
*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))/((b*g*x + a*g)*b*g) - (A^2 + 6*
A*B + 13*B^2)/((b*g*x + a*g)*b*g)
```

3.134 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=272

$$-\frac{bB(c+dx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^3(a+bx)^2(bc-ad)^2}+\frac{4Bd(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g^3(a+bx)(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+dx}{g^3}$$

```
[Out] (8*B^2*d*(c + d*x))/((b*c - a*d)^2*g^3*(a + b*x)) - (b*B^2*(c + d*x)^2)/((b
*c - a*d)^2*g^3*(a + b*x)^2) + (4*B*d*(c + d*x)*(A + B*Log[(e*(a + b*x)^2)/
(c + d*x)^2]))/((b*c - a*d)^2*g^3*(a + b*x)) - (b*B*(c + d*x)^2*(A + B*Log[
(e*(a + b*x)^2)/(c + d*x)^2]))/((b*c - a*d)^2*g^3*(a + b*x)^2) + (d*(c + d*
x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/((b*c - a*d)^2*g^3*(a + b*x)
) - (b*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(2*(b*c - a*
d)^2*g^3*(a + b*x)^2)
```

Rubi [C] time = 1.04621, antiderivative size = 579, normalized size of antiderivative = 2.13, number of steps used = 30, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{4B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{4B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{2Bd^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg^3(bc-ad)^2}-\frac{2Bd^2\log(c+dx)}{bg^3(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -(B^2/(b*g^3*(a + b*x)^2)) + (6*B^2*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (6*B
^2*d^2*Log[a + b*x])/(b*(b*c - a*d)^2*g^3) - (2*B^2*d^2*Log[a + b*x]^2)/(b*
(b*c - a*d)^2*g^3) - (B*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*g^3*(a
 + b*x)^2) + (2*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d
)*g^3*(a + b*x)) + (2*B*d^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2]))/(b*(b*c - a*d)^2*g^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/
(2*b*g^3*(a + b*x)^2) - (6*B^2*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) + (4
*B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*g
^3) - (2*B*d^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*(b
*c - a*d)^2*g^3) - (2*B^2*d^2*Log[c + d*x]^2)/(b*(b*c - a*d)^2*g^3) + (4*B^
2*d^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) +
(4*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3)
```

```
+ (4*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)^2(a+bx)^2} + \cdots}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(2Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{(bc-ad)^2g^3} - \cdots$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{2Bd^2\log(a+bx)\left(A+B\log \cdots\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{2Bd^2\log(a+bx)\left(A+B\log \cdots\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} + \frac{2Bd^2\log(a+bx)\left(A+B\log \cdots\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} \cdots$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bg^3(a+bx)^2} \cdots$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+bx)}{b(bc-ad)^2g^3} - \frac{B\left(\cdots\right.}{\cdots}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+bx)}{b(bc-ad)^2g^3} - \frac{B\left(\cdots\right.}{\cdots}$$

Mathematica [C] time = 0.490212, size = 451, normalized size = 1.66

$$-\frac{2B\left(2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-2Bd^2(a+bx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*((b*c - a*d)^2*(A + B*L
og[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[
(e*(a + b*x)^2)/(c + d*x)^2]) - 2*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(
e*(a + b*x)^2)/(c + d*x)^2]) + 2*d^2*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)
/(c + d*x)^2])*Log[c + d*x] - 4*B*d*(a + b*x)*(b*c - a*d + d*(a + b*x)*Log[
a + b*x] - d*(a + b*x)*Log[c + d*x]) + B*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d
)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*
x]) + 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))
/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - 2*B*d^2*(a +
 b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(2*b*g^3*(a + b
*x)^2)
```

Maple [B] time = 0.139, size = 815, normalized size = 3.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2*d^2/g^3*A^2*b/(a*d-b*c)^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2+d^2/g^3*A^2/
(a*d-b*c)^2/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)-7*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)^2/b*B^2/(d*x+c)^2+3*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*b*B^2/(a
^2*d^2-2*a*b*c*d+b^2*c^2)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)-6*d^2/g
^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*B^2/(a*d-b*c)/(d*x+c)+4*d^2/g^3/(1/(d*x+
c)*a*d-b*c/(d*x+c)+b)^2*B^2/(a*d-b*c)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+
c)+b)^2/d^2)+d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*B^2/(a*d-b*c)/(d*x+c)*
ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)^2+1/2*d^2/g^3/(1/(d*x+c)*a*d-b*c/
(d*x+c)+b)^2*b*B^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)^2/d^2)^2-3*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*A*B/b/(d*x+c)^2+d
```

```
^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*b*A*B/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln
(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)-2*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)^2*A*B/(a*d-b*c)/(d*x+c)+2*d^2/g^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2*A*B/
(a*d-b*c)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 1.85735, size = 1351, normalized size = 4.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x, algorithm="ma
xima")
```

```
[Out] (((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2
*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a
*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a
^2*b*d^2)*g^3))*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^
2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - (b^2*c^2 - 8*a*b*c*
d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2*
(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^2
)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*x
^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(
b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g^
3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g^
3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 + A*B*((2*b*d*x - b*c + 3*
a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2*
c - a^3*b*d)*g^3) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^
2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^3*g^3*x^2 + 2*
a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^2
*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3)
) - 1/2*B^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 +
2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))^2/(b^3*g^3*x^2 + 2*a*b^2*
g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [A] time = 1.04559, size = 846, normalized size = 3.11

$$-\frac{\left(A^2+2\,AB+2\,B^2\right)b^2c^2-2\left(A^2+4\,AB+8\,B^2\right)abcd+\left(A^2+6\,AB+14\,B^2\right)a^2d^2-\left(B^2b^2d^2x^2+2\,B^2abd^2x-B^2b^2c^2+\cdots\right.}{2\left(\left(b^5c^2-2\cdots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/2*((A^2 + 2*A*B + 2*B^2)*b^2*c^2 - 2*(A^2 + 4*A*B + 8*B^2)*a*b*c*d + (A^
2 + 6*A*B + 14*B^2)*a^2*d^2 - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b^2*
c^2 + 2*B^2*a*b*c*d)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
 + c^2))^2 - 4*((A*B + 3*B^2)*b^2*c*d - (A*B + 3*B^2)*a*b*d^2)*x - 2*((A*B
+ 3*B^2)*b^2*d^2*x^2 - (A*B + B^2)*b^2*c^2 + 2*(A*B + 2*B^2)*a*b*c*d + 2*(B
^2*b^2*c*d + (A*B + 2*B^2)*a*b*d^2)*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/
(d^2*x^2 + 2*c*d*x + c^2)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2
+ 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*
b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 6.76981, size = 877, normalized size = 3.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**3,x)
```

```
[Out] -2*B*d**2*(A + 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 + 6*B**2*a*d**3
+ 6*B**2*b*c*d**2 - 2*B*a**3*d**5*(A + 3*B)/(a*d - b*c)**2 + 6*B*a**2*b*c*d
**4*(A + 3*B)/(a*d - b*c)**2 - 6*B*a*b**2*c**2*d**3*(A + 3*B)/(a*d - b*c)**
2 + 2*B*b**3*c**3*d**2*(A + 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 + 12*B**2*b*
d**3))/(b*g**3*(a*d - b*c)**2) + 2*B*d**2*(A + 3*B)*log(x + (2*A*B*a*d**3 +
 2*A*B*b*c*d**2 + 6*B**2*a*d**3 + 6*B**2*b*c*d**2 + 2*B*a**3*d**5*(A + 3*B)
/(a*d - b*c)**2 - 6*B*a**2*b*c*d**4*(A + 3*B)/(a*d - b*c)**2 + 6*B*a*b**2*c
**2*d**3*(A + 3*B)/(a*d - b*c)**2 - 2*B*b**3*c**3*d**2*(A + 3*B)/(a*d - b*c
)**2)/(4*A*B*b*d**3 + 12*B**2*b*d**3))/(b*g**3*(a*d - b*c)**2) + (2*B**2*a*
c*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(a + b*x)**2/
(c + d*x)**2)**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*g**3
*x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*g**3
*x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**3*x*
*2) + (-A*B*a*d + A*B*b*c - 3*B**2*a*d + B**2*b*c - 2*B**2*b*d*x)*log(e*(a
+ b*x)**2/(c + d*x)**2)/(a**3*b*d*g**3 - a**2*b**2*c*g**3 + 2*a**2*b**2*d*g
**3*x - 2*a*b**3*c*g**3*x + a*b**3*d*g**3*x**2 - b**4*c*g**3*x**2) - (A**2*
a*d - A**2*b*c + 6*A*B*a*d - 2*A*B*b*c + 14*B**2*a*d - 2*B**2*b*c + x*(4*A*
B*b*d + 12*B**2*b*d))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + x**2*(2*a*b**
```

```
3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4*a*b**3*c*g**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^3,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(b*g*x + a*g)^3, x)
```

3.135 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=429

$$-\frac{b^2(c+dx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{3g^4(a+bx)^3(bc-ad)^3}-\frac{4b^2B(c+dx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{d^2(c+dx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g^4(a+bx)(bc-ad)^3}-\frac{4Bd^2(}{}$$

```
[Out] (-8*B^2*d^2*(c + d*x))/((b*c - a*d)^3*g^4*(a + b*x)) + (2*b*B^2*d*(c + d*x)
^2)/((b*c - a*d)^3*g^4*(a + b*x)^2) - (8*b^2*B^2*(c + d*x)^3)/(27*(b*c - a*
d)^3*g^4*(a + b*x)^3) - (4*B*d^2*(c + d*x)*(A + B*Log[(e*(a + b*x)^2)/(c +
d*x)^2]))/((b*c - a*d)^3*g^4*(a + b*x)) + (2*b*B*d*(c + d*x)^2*(A + B*Log[(
e*(a + b*x)^2)/(c + d*x)^2]))/((b*c - a*d)^3*g^4*(a + b*x)^2) - (4*b^2*B*(c
 + d*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(9*(b*c - a*d)^3*g^4*(a
 + b*x)^3) - (d^2*(c + d*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/((b
*c - a*d)^3*g^4*(a + b*x)) + (b*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c
 + d*x)^2])^2)/((b*c - a*d)^3*g^4*(a + b*x)^2) - (b^2*(c + d*x)^3*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(3*(b*c - a*d)^3*g^4*(a + b*x)^3)
```

Rubi [C] time = 1.22523, antiderivative size = 692, normalized size of antiderivative = 1.61, number of steps used = 34, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{8B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{4Bd^3\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{4Bd^3\log(c+dx}{3bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-8*B^2)/(27*b*g^4*(a + b*x)^3) + (10*B^2*d)/(9*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (44*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (44*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (4*B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)
^3*g^4) - (4*B*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(9*b*g^4*(a + b*x)
^3) + (2*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*(b*c - a*d)*g^4
*(a + b*x)^2) - (4*B*d^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*(b*
c - a*d)^2*g^4*(a + b*x)) - (4*B*d^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(a + b*x)^2)/(c +
d*x)^2])^2/(3*b*g^4*(a + b*x)^3) + (44*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*
```

```
d)^3*g^4) - (8*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b
*(b*c - a*d)^3*g^4) + (4*B*d^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log
[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (4*B^2*d^3*Log[c + d*x]^2)/(3*b*(b*c -
 a*d)^3*g^4) - (8*B^2*d^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b
*(b*c - a*d)^3*g^4) - (8*B^2*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(3*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(3*b*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^4} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)^2(a+bx)^3} + \cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^4}\,dx}{3g^4} - \frac{\left(4Bd^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{3(bc-ad)^3g^4} + \cdots$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{9bg^4(a+bx)^3} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{4Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} \cdots$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{9bg^4(a+bx)^3} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{4Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} \cdots$$

$$= -\frac{4B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{9bg^4(a+bx)^3} + \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} - \frac{4Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} \cdots$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+\cdots}{9b(bc-ad)^3g\cdots}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+\cdots}{9b(bc-ad)^3g\cdots}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+\cdots}{9b(bc-ad)^3g\cdots}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+\cdots}{9b(bc-ad)^3g\cdots}$$

Mathematica [C] time = 0.713385, size = 598, normalized size = 1.39

$$-\frac{2B\left(-18Bd^3(a+bx)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18Bd^3(a+bx)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx\cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -(9*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*(6*(b*c - a*d)^3*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 9*d*(b*c - a*d)^2*(a + b*x)*(A + B*L
og[(e*(a + b*x)^2)/(c + d*x)^2]) + 18*d^2*(b*c - a*d)*(a + b*x)^2*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]) + 18*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]) - 18*d^3*(a + b*x)^3*(A + B*Log[(e*(a + b*x
)^2)/(c + d*x)^2])*Log[c + d*x] + 36*B*d^2*(a + b*x)^2*(b*c - a*d + d*(a +
b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a + b*x)*((b*c - a*d
)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2
*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a +
b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d
^3*(a + b*x)^3*Log[c + d*x]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a +
b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*
c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] -
Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*
c - a*d)^3)/(27*b*g^4*(a + b*x)^3)
```

Maple [B] time = 0.204, size = 1343, normalized size = 3.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x)
```

```
[Out] -d^3/g^4*A^2*b/(a*d-b*c)^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2+d^3/g^4*A^2/(a*d
-b*c)^3/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+1/3*d^3/g^4*A^2*b^2/(a*d-b*c)^3/(1/(d
*x+c)*a*d-b*c/(d*x+c)+b)^3-170/27*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B
^2/b/(d*x+c)^3+22/9*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*b^2*B^2/(a^3*d^
3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2
/d^2)-44/9*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*b*B^2/(a^2*d^2-2*a*b*c*d
+b^2*c^2)/(d*x+c)-98/9*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B^2/(a*d-b*c
```

```
)/(d*x+c)^2+4*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B^2/(a*d-b*c)/(d*x+c)
^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+1/3*d^3/g^4/(1/(d*x+c)*a*d-b*c
/(d*x+c)+b)^3*B^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln(e*(1
/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)^2+d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^
3*B^2/(a*d-b*c)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)^2+6*d^3
/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*B^2*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x
+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d^3/g^4/(1/(d*x+c)*a*d-b*c/(d
*x+c)+b)^3*b*B^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*
c/(d*x+c)+b)^2/d^2)^2-22/9*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*A*B/b/(d
*x+c)^3+2/3*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*b^2*A*B/(a^3*d^3-3*a^2*
b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)-4/
3*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*A*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)
/(d*x+c)-10/3*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*A*B/(a*d-b*c)/(d*x+c)
^2+2*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^3*A*B/(a*d-b*c)/(d*x+c)^2*ln(e*(
1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+2*d^3/g^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)
^3*A*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)^2/d^2)
```

Maxima [B] time = 2.81718, size = 2126, normalized size = 4.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x, algorithm="ma
xima")
```

```
[Out] -2/27*(3*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d
- 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c
^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d
+ a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d
^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^
4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b
*d^3)*g^4))*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 +
2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + (4*b^3*c^3 - 27*a*b^2*c
^2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(
b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 1
8*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2
- 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a
*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 +
33*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d
^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*
```

```
g^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*
g^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a
*b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)
*x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5
*b^2*d^3*g^4)*x))*B^2 - 2/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 1
1*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^
2)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b
^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d
+ a^5*b*d^2)*g^4) + 3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(
d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(b^4*g^4*x^3 +
3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c
^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)
/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*l
og(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2
) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a
^2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*
b^2*g^4*x + a^3*b*g^4)
```

Fricas [A] time = 1.1358, size = 1474, normalized size = 3.44

$$-\frac{\left(9\,A^2+12\,AB+8\,B^2\right)b^3c^3-27\left(A^2+2\,AB+2\,B^2\right)ab^2c^2d+27\left(A^2+4\,AB+8\,B^2\right)a^2bcd^2-\left(9\,A^2+66\,AB+170\,B^2\right)a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/27*((9*A^2 + 12*A*B + 8*B^2)*b^3*c^3 - 27*(A^2 + 2*A*B + 2*B^2)*a*b^2*c^
2*d + 27*(A^2 + 4*A*B + 8*B^2)*a^2*b*c*d^2 - (9*A^2 + 66*A*B + 170*B^2)*a^3
*d^3 + 12*((3*A*B + 11*B^2)*b^3*c*d^2 - (3*A*B + 11*B^2)*a*b^2*d^3)*x^2 + 9
*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)
/(d^2*x^2 + 2*c*d*x + c^2))^2 - 6*((3*A*B + 5*B^2)*b^3*c^2*d - 18*(A*B + 3*
B^2)*a*b^2*c*d^2 + (15*A*B + 49*B^2)*a^2*b*d^3)*x + 6*((3*A*B + 11*B^2)*b^3
*d^3*x^3 + (3*A*B + 2*B^2)*b^3*c^3 - 9*(A*B + B^2)*a*b^2*c^2*d + 9*(A*B + 2
*B^2)*a^2*b*c*d^2 + 3*(2*B^2*b^3*c*d^2 + 3*(A*B + 3*B^2)*a*b^2*d^3)*x^2 - 3
*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 3*(A*B + 2*B^2)*a^2*b*d^3)*x)*log((b^
2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^7*c^3 - 3*a*b^
6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5
*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^
```

```
4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c
^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

Sympy [B] time = 35.2154, size = 1561, normalized size = 3.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**4,x)
```

```
[Out] -4*B*d**3*(3*A + 11*B)*log(x + (12*A*B*a*d**4 + 12*A*B*b*c*d**3 + 44*B**2*a
*d**4 + 44*B**2*b*c*d**3 - 4*B*a**4*d**7*(3*A + 11*B)/(a*d - b*c)**3 + 16*B
*a**3*b*c*d**6*(3*A + 11*B)/(a*d - b*c)**3 - 24*B*a**2*b**2*c**2*d**5*(3*A
+ 11*B)/(a*d - b*c)**3 + 16*B*a*b**3*c**3*d**4*(3*A + 11*B)/(a*d - b*c)**3
- 4*B*b**4*c**4*d**3*(3*A + 11*B)/(a*d - b*c)**3)/(24*A*B*b*d**4 + 88*B**2*
b*d**4))/(9*b*g**4*(a*d - b*c)**3) + 4*B*d**3*(3*A + 11*B)*log(x + (12*A*B*
a*d**4 + 12*A*B*b*c*d**3 + 44*B**2*a*d**4 + 44*B**2*b*c*d**3 + 4*B*a**4*d**
7*(3*A + 11*B)/(a*d - b*c)**3 - 16*B*a**3*b*c*d**6*(3*A + 11*B)/(a*d - b*c)
**3 + 24*B*a**2*b**2*c**2*d**5*(3*A + 11*B)/(a*d - b*c)**3 - 16*B*a*b**3*c*
*3*d**4*(3*A + 11*B)/(a*d - b*c)**3 + 4*B*b**4*c**4*d**3*(3*A + 11*B)/(a*d
- b*c)**3)/(24*A*B*b*d**4 + 88*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3
*B**2*a**2*c*d**2 + 3*B**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**
3*x**2 + B**2*b**2*c**3 + B**2*b**2*d**3*x**3)*log(e*(a + b*x)**2/(c + d*x)
**2)**2/(3*a**6*d**3*g**4 - 9*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9
*a**4*b**2*c**2*d*g**4 - 27*a**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4
*x**2 - 3*a**3*b**3*c**3*g**4 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c
*d**2*g**4*x**2 + 3*a**3*b**3*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27
*a**2*b**4*c**2*d*g**4*x**2 - 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*
g**4*x**2 + 9*a*b**5*c**2*d*g**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a*
*2*d**2 + 12*A*B*a*b*c*d - 6*A*B*b**2*c**2 - 22*B**2*a**2*d**2 + 14*B**2*a*
b*c*d - 30*B**2*a*b*d**2*x - 4*B**2*b**2*c**2 + 6*B**2*b**2*c*d*x - 12*B**2
*b**2*d**2*x**2)*log(e*(a + b*x)**2/(c + d*x)**2)/(9*a**5*b*d**2*g**4 - 18*
a**4*b**2*c*d*g**4 + 27*a**4*b**2*d**2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*
a**3*b**3*c*d*g**4*x + 27*a**3*b**3*d**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4
*x - 54*a**2*b**4*c*d*g**4*x**2 + 9*a**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c*
*2*g**4*x**2 - 18*a*b**5*c*d*g**4*x**3 + 9*b**6*c**2*g**4*x**3) - (9*A**2*a
**2*d**2 - 18*A**2*a*b*c*d + 9*A**2*b**2*c**2 + 66*A*B*a**2*d**2 - 42*A*B*a
*b*c*d + 12*A*B*b**2*c**2 + 170*B**2*a**2*d**2 - 46*B**2*a*b*c*d + 8*B**2*b
**2*c**2 + x**2*(36*A*B*b**2*d**2 + 132*B**2*b**2*d**2) + x*(90*A*B*a*b*d**
2 - 18*A*B*b**2*c*d + 294*B**2*a*b*d**2 - 30*B**2*b**2*c*d))/(27*a**5*b*d**
2*g**4 - 54*a**4*b**2*c*d*g**4 + 27*a**3*b**3*c**2*g**4 + x**3*(27*a**2*b**
```

```
4*d**2*g**4 - 54*a*b**5*c*d*g**4 + 27*b**6*c**2*g**4) + x**2*(81*a**3*b**3*
d**2*g**4 - 162*a**2*b**4*c*d*g**4 + 81*a*b**5*c**2*g**4) + x*(81*a**4*b**2
*d**2*g**4 - 162*a**3*b**3*c*d*g**4 + 81*a**2*b**4*c**2*g**4))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A\right)^2}{\left(bgx + ag\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^4,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(b*g*x + a*g)^4, x)
```

3.136 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=587

$$-\frac{b^3(c+dx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{4g^5(a+bx)^4(bc-ad)^4}-\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+dx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{g^5(a+bx)^3(bc-ad)^4}+\frac{4b^2}{}$$

```
[Out] (8*B^2*d^3*(c + d*x))/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*B^2*d^2*(c + d*x
)^2)/((b*c - a*d)^4*g^5*(a + b*x)^2) + (8*b^2*B^2*d*(c + d*x)^3)/(9*(b*c -
a*d)^4*g^5*(a + b*x)^3) - (b^3*B^2*(c + d*x)^4)/(8*(b*c - a*d)^4*g^5*(a + b
*x)^4) + (4*B*d^3*(c + d*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*c
 - a*d)^4*g^5*(a + b*x)) - (3*b*B*d^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/((b*c - a*d)^4*g^5*(a + b*x)^2) + (4*b^2*B*d*(c + d*x)^3*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*c - a*d)^4*g^5*(a + b*x)^3)
- (b^3*B*(c + d*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(4*(b*c - a*
d)^4*g^5*(a + b*x)^4) + (d^3*(c + d*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2])^2)/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*d^2*(c + d*x)^2*(A + B*Log[(e*
(a + b*x)^2)/(c + d*x)^2])^2)/(2*(b*c - a*d)^4*g^5*(a + b*x)^2) + (b^2*d*(c
 + d*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/((b*c - a*d)^4*g^5*(a
 + b*x)^3) - (b^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(
4*(b*c - a*d)^4*g^5*(a + b*x)^4)
```

Rubi [C] time = 1.39387, antiderivative size = 757, normalized size of antiderivative = 1.29, number of steps used = 38, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^5(bc-ad)^4}+\frac{2B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^5(bc-ad)^4}+\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bg^5(bc-ad)^4}-\frac{Bd^4\log(c+dx)\left(\right.}{bg^5(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(8*b*g^5*(a + b*x)^4) + (7*B^2*d)/(18*b*(b*c - a*d)*g^5*(a + b*x)^3) -
 (13*B^2*d^2)/(12*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(6*b*(b*c
 - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(6*b*(b*c - a*d)^4*g^5
) - (B^2*d^4*Log[a + b*x]^2)/(b*(b*c - a*d)^4*g^5) - (B*(A + B*Log[(e*(a +
b*x)^2)/(c + d*x)^2]))/(4*b*g^5*(a + b*x)^4) + (B*d*(A + B*Log[(e*(a + b*x)
```

```
^2)/(c + d*x)^2]))/(3*b*(b*c - a*d)*g^5*(a + b*x)^3) - (B*d^2*(A + B*Log[(e
*(a + b*x)^2)/(c + d*x)^2]))/(2*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (B*d^3*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d)^3*g^5*(a + b*x)) +
(B*d^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b*(b*c - a*d
)^4*g^5) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(4*b*g^5*(a + b*x)^4)
 - (25*B^2*d^4*Log[c + d*x])/(6*b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*Log[-((d*
(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^4*g^5) - (B*d^4*(A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(b*(b*c - a*d)^4*g^5) - (
B^2*d^4*Log[c + d*x]^2)/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^5(c+dx)}\,dx}{bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int\left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)^5} - \frac{bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)^2(a+bx)^4} + \frac{bd^2(\cdots}{(\cdots}\cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)^5}\,dx}{g^5} + \frac{\left(Bd^4\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{(bc-ad)^4g^5} - \frac{\left(Bd^5\right)\cdots}{\cdots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4bg^5(a+bx)^4} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2} + \frac{Bd\cdots}{\cdots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4bg^5(a+bx)^4} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2} + \frac{Bd\cdots}{\cdots}$$

$$= -\frac{B\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4bg^5(a+bx)^4} + \frac{Bd\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3} - \frac{Bd^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2} + \frac{Bd\cdots}{\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d^3}{6b(bc-ad)^3g^5(\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d^3}{6b(bc-ad)^3g^5(\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d^3}{6b(bc-ad)^3g^5(\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d^3}{6b(bc-ad)^3g^5(\cdots}$$

Mathematica [C] time = 1.02916, size = 762, normalized size = 1.3

$$-\frac{B\left(72Bd^4(a+bx)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-72Bd^4(a+bx)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -(18*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (B*(18*(b*c - a*d)^4*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 24*d*(-(b*c) + a*d)^3*(a + b*x)*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 36*d^2*(b*c - a*d)^2*(a + b*x)^2*(A
+ B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 72*d^3*(-(b*c) + a*d)*(a + b*x)^3*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 72*d^4*(a + b*x)^4*Log[a + b*x]*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 72*d^4*(a + b*x)^4*(A + B*Log[(e*
(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - 144*B*d^3*(a + b*x)^3*(b*c - a*d
+ d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) + 36*B*d^2*(a + b*x)
^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a
+ b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) - 8*B*d*(a + b*x)*(2*(b*c - a*d)^3
 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a +
 b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) + 3*B*(3*(b*c - a*d)
^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)^2 + 12*
d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] + 12*d^4*(
a + b*x)^4*Log[c + d*x]) + 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) - 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c -
a*d)^4)/(72*b*g^5*(a + b*x)^4)
```

Maple [B] time = 0.297, size = 1943, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x)
```

```
[Out] -3/2*d^4/g^5*A^2*b/(a*d-b*c)^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2+d^4/g^5*A^2/
(a*d-b*c)^4/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+d^4/g^5*A^2*b^2/(a*d-b*c)^4/(1/(d
*x+c)*a*d-b*c/(d*x+c)+b)^3-1/4*d^4/g^5*A^2*b^3/(a*d-b*c)^4/(1/(d*x+c)*a*d-b
```

```
*c/(d*x+c)+b)^4-415/72*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B^2/b/(d*x+c
)^4+25/12*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*b^3*B^2/(a^4*d^4-4*a^3*b*
c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)^2/d^2)-25/6*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B^2*b^2/(a^3*d^3
-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)-163/12*d^4/g^5/(1/(d*x+c)*a*d
-b*c/(d*x+c)+b)^4*b*B^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2-271/18*d^4/g^
5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B^2/(a*d-b*c)/(d*x+c)^3+4*d^4/g^5/(1/(d*x
+c)*a*d-b*c/(d*x+c)+b)^4*B^2/(a*d-b*c)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d
*x+c)+b)^2/d^2)+1/4*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B^2*b^3/(a^4*d^
4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln(e*(1/(d*x+c)*a*
d-b*c/(d*x+c)+b)^2/d^2)^2+d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*B^2/(a*d-
b*c)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)^2+9*d^4/g^5/(1/(d*
x+c)*a*d-b*c/(d*x+c)+b)^4*B^2*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2*ln(e*
(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+22/3*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)^4*B^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)*ln(e*(
1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4
*B^2*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)*ln(e*(1/(d*x
+c)*a*d-b*c/(d*x+c)+b)^2/d^2)^2+3/2*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4
*b*B^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)^2/d^2)^2-d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*A*B*b^2/(a^3*d^3-3*a^
2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(d*x+c)-25/12*d^4/g^5/(1/(d*x+c)*a*d-b*c/(
d*x+c)+b)^4*A*B/b/(d*x+c)^4+1/2*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*b^3
*A*B/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln(e*(
1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)-7/2*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+
b)^4*A*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(d*x+c)^2-13/3*d^4/g^5/(1/(d*x+c)*a*
d-b*c/(d*x+c)+b)^4*A*B/(a*d-b*c)/(d*x+c)^3+2*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*
x+c)+b)^4*A*B/(a*d-b*c)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
+3*d^4/g^5/(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^4*A*B*b/(a^2*d^2-2*a*b*c*d+b^2*c^2
)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+2*d^4/g^5/(1/(d*x+c)*
a*d-b*c/(d*x+c)+b)^4*A*B*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/
(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
```

Maxima [B] time = 2.25964, size = 3077, normalized size = 5.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x, algorithm="ma
xima")
```

```
[Out] 1/72*(6*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25
*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
```

```
 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3
)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)
*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3
)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^
5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*
a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c
^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(b^2*e*x^2
/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d
^2*x^2 + 2*c*d*x + c^2)) - (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d^
2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(13
*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 + 4
*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)^
2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x +
 a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2*
c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d
^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*a
*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^4
*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*l
og(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*b
^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*b
^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g^
5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 - 4
*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6*
c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)*
x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4*
a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 + 1/12*A*B*((12*b^3*d^3*x^3 -
3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 - 7
*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^3
 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 -
3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3 -
 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3
- 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 - 3
*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) - 6*log(b^2*e*x^2/(d^2*x
^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2
+ 2*c*d*x + c^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^
3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d +
6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)
/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^
4)*g^5)) - 1/4*B^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2
*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))^2/(b^5*g^5*x^4 + 4
*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^2
/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4
*b*g^5)
```

Fricas [A] time = 1.20757, size = 2229, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/72*(9*(2*A^2 + 2*A*B + B^2)*b^4*c^4 - 8*(9*A^2 + 12*A*B + 8*B^2)*a*b^3*c
^3*d + 108*(A^2 + 2*A*B + 2*B^2)*a^2*b^2*c^2*d^2 - 72*(A^2 + 4*A*B + 8*B^2)
*a^3*b*c*d^3 + (18*A^2 + 150*A*B + 415*B^2)*a^4*d^4 - 12*((6*A*B + 25*B^2)*
b^4*c*d^3 - (6*A*B + 25*B^2)*a*b^3*d^4)*x^3 + 6*((6*A*B + 13*B^2)*b^4*c^2*d
^2 - 16*(3*A*B + 11*B^2)*a*b^3*c*d^3 + (42*A*B + 163*B^2)*a^2*b^2*d^4)*x^2
- 18*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 + 4*B^2
*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*
B^2*a^3*b*c*d^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c
^2))^2 - 4*((6*A*B + 7*B^2)*b^4*c^3*d - 12*(3*A*B + 5*B^2)*a*b^3*c^2*d^2 +
108*(A*B + 3*B^2)*a^2*b^2*c*d^3 - (78*A*B + 271*B^2)*a^3*b*d^4)*x - 6*((6*A
*B + 25*B^2)*b^4*d^4*x^4 - 3*(2*A*B + B^2)*b^4*c^4 + 8*(3*A*B + 2*B^2)*a*b^
3*c^3*d - 36*(A*B + B^2)*a^2*b^2*c^2*d^2 + 24*(A*B + 2*B^2)*a^3*b*c*d^3 + 4
*(3*B^2*b^4*c*d^3 + 2*(3*A*B + 11*B^2)*a*b^3*d^4)*x^3 - 6*(B^2*b^4*c^2*d^2
- 8*B^2*a*b^3*c*d^3 - 6*(A*B + 3*B^2)*a^2*b^2*d^4)*x^2 + 4*(B^2*b^4*c^3*d -
 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 + 6*(A*B + 2*B^2)*a^3*b*d^4)*x)
*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/((b^9*c^4
- 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^
4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 +
a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2
 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*
d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4
 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(b*g*x+a*g)**5,x)
```

[Out] Timed out

Giac [A] time = 1.64779, size = 1180, normalized size = 2.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(b*g*x+a*g)^5,x, algorithm="gi
ac")
```

```
[Out] 1/4*(B^2*d^4/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a
^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) - B^2/((b*g*x + a*g)^4*b*g))*log(b^2/(b^2
*c^2*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g
*x + a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2))^2 +
 1/12*(12*B^2*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a
^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 6*B^2*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a^2*
d^2*g)*(b*g*x + a*g)^2*b*g^2) + 4*B^2*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2)
 - 3*(2*A*B*b^3*g^3 + 3*B^2*b^3*g^3)/((b*g*x + a*g)^4*b^4*g^4))*log(b^2/(b^
2*c^2*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*
g*x + a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)) -
1/6*(6*A*B*d^4 + 31*B^2*d^4)*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g)
 - d)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*
c*d^3*g^5 + a^4*b*d^4*g^5) + 1/6*(6*A*B*d^3 + 31*B^2*d^3)/((b^3*c^3*g^3 - 3
*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 1/
12*(6*A*B*b*d^2 + 19*B^2*b*d^2)/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(b*g
*x + a*g)^2*b^2*g^2) + 1/18*(6*A*B*b^2*d*g + 13*B^2*b^2*d*g)/((b*g*x + a*g)
^3*(b*c - a*d)*b^3*g^3) - 1/8*(2*A^2*b^3*g^3 + 6*A*B*b^3*g^3 + 5*B^2*b^3*g^
3)/((b*g*x + a*g)^4*b^4*g^4)
```

3.137 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]

Rubi [A] time = 0.196614, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]

[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + 2*a*b*g^2*Defer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x] + b^2*g^2*Defer[Int][x^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]

Rubi steps

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx=\int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx$$

$$=\left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+\left(b^2g^2\right)\int \frac{x}{A+B\log}$$

Mathematica [A] time = 0.158243, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Maple [A] time = 0.986, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((b^2*e*x^2 + 2*a*b*e*
x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{B\log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

3.138 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{ag+bgx}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi [A] time = 0.101449, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\
&= (ag)\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx
\end{aligned}$$

Mathematica [A] time = 0.115246, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Maple [A] time = 0.857, size = 0, normalized size = 0.

$$\int (bgx + ag)\left(A + B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B\log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bgx + ag}{B\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] integral((b*g*x + a*g)/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*
c*d*x + c^2)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

3.139 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi [A] time = 0.0731074, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]

[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.0704607, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Maple [A] time = 1.065, size = 0, normalized size = 0.

$$\int \frac{1}{bgx + ag} \left(A + B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)\left(B\log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Abgx + Aag + (Bbgx + Bag)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fric
as")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((b^2*e*x^2 + 2*a*b*e*x
+ a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

3.140 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=91

$$\frac{e^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\mathrm{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{2Bg^2(a+bx)(bc-ad)}$$

```
[Out] (E^(A/(2*B))*Sqrt[(e*(a + b*x)^2)/(c + d*x)^2]*(c + d*x)*ExpIntegralEi[-(A
+ B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*B)])/(2*B*(b*c - a*d)*g^2*(a + b*x
))
```

Rubi [F] time = 0.0867152, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.0738722, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Maple [F] time = 1.091, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Ab^{2}g^{2}x^{2}+2\,Aabg^{2}x+Aa^{2}g^{2}+\left(Bb^{2}g^{2}x^{2}+2\,Babg^{2}x+Ba^{2}g^{2}\right)\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*
B*a*b*g^2*x + B*a^2*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c
*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

3.141 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=149

$$\frac{bee^{A/B}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{B}\right)}{2Bg^3(bc-ad)^2}-\frac{de^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\text{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{2Bg^3(a+bx)(bc-ad)^2}$$

```
[Out] (b*e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/B)])/
(2*B*(b*c - a*d)^2*g^3) - (d*E^(A/(2*B))*Sqrt[(e*(a + b*x)^2)/(c + d*x)^2]*
(c + d*x)*ExpIntegralEi[-(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*B)])/(
2*B*(b*c - a*d)^2*g^3*(a + b*x))
```

Rubi [F] time = 0.0738272, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.0797001, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Maple [F] time = 1.153, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ab^{3}g^{3}x^{3}+3\,Aab^{2}g^{3}x^{2}+3\,Aa^{2}bg^{3}x+Aa^{3}g^{3}+\left(Bb^{3}g^{3}x^{3}+3\,Bab^{2}g^{3}x^{2}+3\,Ba^{2}bg^{3}x+Ba^{3}g^{3}\right)\log\left(\frac{b^{2}ex^{2}+2\,abex}{d^{2}x^{2}+2\,cdx}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3
 + (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((b
^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

3.142 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi [A] time = 0.215104, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x] + b^2*g^2
*Defer[Int][x^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int\left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)dx$$

$$=\left(a^2g^2\right)\int\frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+\left(2abg^2\right)\int\frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+\left(b^2g^2\right)\int$$

Mathematica [A] time = 0.467073, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Maple [A] time = 0.933, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^3dg^2x^4+a^3cg^2+\left(b^3cg^2+3\,ab^2dg^2\right)x^3+3\left(ab^2cg^2+a^2bdg^2\right)x^2+\left(3\,a^2bcg^2+a^3dg^2\right)x}{2\left(2\,(bc-ad)B^2\log\left(bx+a\right)-2\,(bc-ad)B^2\log\left(dx+c\right)+(bc-ad)AB+(bc\log\left(e\right)-ad\log\left(e\right))B^2\right)}+\int\frac{4\,b}{2\left(2\,(bc-ad)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] -1/2*(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^
2*c*g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/(2*(b*c - a*d)*
B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*
log(e) - a*d*log(e))*B^2) + integrate(1/2*(4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2
+ a^3*d*g^2 + 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*
```

```
g^2)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) +
(b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2 + 2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((b^2*e*x^2 + 2*a*b*
e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*
x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.143 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi [A] time = 0.114215, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)dx\\
&= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx
\end{aligned}$$

Mathematica [A] time = 0.344706, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Maple [A] time = 0.935, size = 0, normalized size = 0.

$$\int (bgx+ag)\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^2dgx^3+a^2cg+\left(b^2cg+2\,abdg\right)x^2+\left(2\,abcg+a^2dg\right)x}{2\left(2\,(bc-ad)B^2\log\left(bx+a\right)-2\,(bc-ad)B^2\log\left(dx+c\right)+(bc-ad)AB+(bc\log\left(e\right)-ad\log\left(e\right))B^2\right)}+\int\frac{}{2\left(2\,(bc-ad)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*
d*g)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) +
(b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(3*b^2*d*g
*x^2 + 2*a*b*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/(2*(b*c - a*d)*B^2*
log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(
```

```
e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 +
2*c*d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*
c*d*x + c^2)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{bgx+ag}{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.144 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),
x]
```

Rubi [A] time = 0.0814711, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.140253, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Maple [A] time = 0.902, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\,(bx+a)^{2}}{(dx+c)^{2}}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$d\int \frac{1}{2\left(2\left(bcg-adg\right)B^{2}\log\left(bx+a\right)-2\left(bcg-adg\right)B^{2}\log\left(dx+c\right)+\left(bcg-adg\right)AB+\left(bcg\log\left(e\right)-adg\log\left(e\right)\right)B^{2}\right)}\,dx-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="ma
xima")
```

```
[Out] d*integrate(1/2/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B^2
*log(d*x + c) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2), x
) - 1/2*(d*x + c)/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B
^2*log(d*x + c) + (b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^{2}bgx+A^{2}ag+\left(B^{2}bgx+B^{2}ag\right)\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\left(ABbgx+ABag\right)\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((b^2*e*x^2 + 2*
a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log
((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

3.145 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=147

$$-\frac{e^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\mathrm{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{4B^2g^2(a+bx)(bc-ad)}-\frac{c+dx}{2Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}$$

```
[Out] -(E^(A/(2*B))*Sqrt[(e*(a + b*x)^2)/(c + d*x)^2]*(c + d*x)*ExpIntegralEi[-(A
 + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*B)])/(4*B^2*(b*c - a*d)*g^2*(a +
b*x)) - (c + d*x)/(2*B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)
/(c + d*x)^2]))
```

Rubi [F] time = 0.0935896, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.178894, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x
]
```

Maple [F] time = 1.224, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2}\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{dx}{2\left(\left(abcg^2-a^2dg^2\right)AB+\left(abcg^2\log(e)-a^2dg^2\log(e)\right)B^2+\left(\left(b^2cg^2-abdg^2\right)AB+\left(b^2cg^2\log(e)-abdg^2\log(e)\right)B^2\right)x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
maxima")
```

```
[Out] -1/2*(d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2
*log(e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2
*log(e))*B^2)*x + 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2
)*B^2)*log(b*x + a) - 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d
```

```
*g^2)*B^2)*log(d*x + c)) + integrate(-1/2/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2
 + (B^2*b^2*g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b
*g^2)*x + 2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a)
- 2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2 + 2\left(ABb^2g^2x^2 + 2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*
x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d
^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2
*g^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx + ag\right)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

3.146 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=263

$$\frac{de^{\frac{A}{2B}}(c+dx)\sqrt{\frac{e(a+bx)^2}{(c+dx)^2}}\,\mathrm{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2B}\right)}{4B^2g^3(a+bx)(bc-ad)^2}-\frac{bee^{A/B}\mathrm{Ei}\left(-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{B}\right)}{2B^2g^3(bc-ad)^2}-\frac{b(c+dx)^2}{2Bg^3(a+bx)^2(bc-ad)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+\right.}$$

```
[Out] -(b*e*E^(A/B)*ExpIntegralEi[-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/B)])
/(2*B^2*(b*c - a*d)^2*g^3) + (d*E^(A/(2*B))*Sqrt[(e*(a + b*x)^2)/(c + d*x)^
2]*(c + d*x)*ExpIntegralEi[-(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*B)]
)/(4*B^2*(b*c - a*d)^2*g^3*(a + b*x)) + (d*(c + d*x))/(2*B*(b*c - a*d)^2*g^
3*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])) - (b*(c + d*x)^2)/(2*
B*(b*c - a*d)^2*g^3*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))
```

Rubi [F] time = 0.0824103, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.347693, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x
]
```

Maple [F] time = 1.471, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3}\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
maxima")
```

```
[Out] -1/2*(d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d
*g^3*log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b
^2*d*g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g
^3*log(e) - a^2*b*d*g^3*log(e))*B^2)*x + 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x
^2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*l
```

```
og(b*x + a) - 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b
*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate(1/
2*(b*d*x + 2*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e)
 - a*b^3*d*g^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*
g^3*log(e) - a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B +
 (a*b^3*c*g^3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 -
 a^3*b*d*g^3)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x + 2*
((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^
2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*
log(b*x + a) - 2*((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*
b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 -
 a^4*d*g^3)*B^2)*log(d*x + c)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\frac{b^2ex^{}}{d^2x}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2
*a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2
*a^3*g^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2
+ 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^
3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx + ag\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right) + A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

3.147 $\int (a+bx)^4 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$

Optimal. Leaf size=171

$$\frac{(a+bx)^5\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{5b}+\frac{Bnx(bc-ad)^4}{5d^4}-\frac{Bn(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bn(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{Bn(bc$$

```
[Out] (B*(b*c - a*d)^4*n*x)/(5*d^4) - (B*(b*c - a*d)^3*n*(a + b*x)^2)/(10*b*d^3)
+ (B*(b*c - a*d)^2*n*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*n*(a + b*x)^4
)/(20*b*d) - (B*(b*c - a*d)^5*n*Log[c + d*x])/(5*b*d^5) + ((a + b*x)^5*(A +
 B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(5*b)
```

Rubi [A] time = 0.183445, antiderivative size = 183, normalized size of antiderivative = 1.07, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^5}{5b}+\frac{Bnx(bc-ad)^4}{5d^4}-\frac{Bn(a+bx)^2(bc-ad)^3}{10bd^3}+\frac{Bn(a+bx)^3(bc-ad)^2}{15bd^2}-\frac{Bn(bc-ad)^5\log(c+dx)}{5bd^5}+\frac{B(a+bx)^5}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (B*(b*c - a*d)^4*n*x)/(5*d^4) - (B*(b*c - a*d)^3*n*(a + b*x)^2)/(10*b*d^3)
+ (B*(b*c - a*d)^2*n*(a + b*x)^3)/(15*b*d^2) - (B*(b*c - a*d)*n*(a + b*x)^4
)/(20*b*d) + (A*(a + b*x)^5)/(5*b) - (B*(b*c - a*d)^5*n*Log[c + d*x])/(5*b*
d^5) + (B*(a + b*x)^5*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(5*b)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (a+bx)^4\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx = \int \left(A(a+bx)^4+B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx$$
$$= \frac{A(a+bx)^5}{5b}+B\int (a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)dx$$
$$= \frac{A(a+bx)^5}{5b}+\frac{B(a+bx)^5\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{5b}-\frac{(B(bc-ad)n}{5}$$
$$= \frac{A(a+bx)^5}{5b}+\frac{B(a+bx)^5\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{5b}-\frac{(B(bc-ad)n}{}$$
$$= \frac{B(bc-ad)^4nx}{5d^4}-\frac{B(bc-ad)^3n(a+bx)^2}{10bd^3}+\frac{B(bc-ad)^2n(a+bx)^3}{15bd^2}-$$

Mathematica [B] time = 0.784216, size = 364, normalized size = 2.13

$$\frac{bdx\left(4a^2b^2d^2\left(30Ad^2x^2+Bn\left(30c^2-15cdx+4d^2x^2\right)\right)+12a^3bd^3(10Adx-10Bcn+3Bdnx)+12a^4d^4(5A+4Bn)+ab^3\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(12*a^4*d^4*(5*A + 4*B*n) + 12*a^3*b*d^3*(-10*B*c*n + 10*A*d*x + 3*B
*d*n*x) + 4*a^2*b^2*d^2*(30*A*d^2*x^2 + B*n*(30*c^2 - 15*c*d*x + 4*d^2*x^2)
) + b^4*(12*A*d^4*x^4 + B*c*n*(12*c^3 - 6*c^2*d*x + 4*c*d^2*x^2 - 3*d^3*x^3
)) + a*b^3*d*(60*A*d^3*x^3 + B*n*(-60*c^3 + 30*c^2*d*x - 20*c*d^2*x^2 + 3*d
^3*x^3))) - 48*a^5*B*d^5*n*Log[a + b*x] - 12*B*(b^5*c^5 - 5*a*b^4*c^4*d + 1
0*a^2*b^3*c^3*d^2 - 10*a^3*b^2*c^2*d^3 + 5*a^4*b*c*d^4 - 5*a^5*d^5)*n*Log[c
 + d*x] + 12*B*d^5*(5*a^5 + 5*a^4*b*x + 10*a^3*b^2*x^2 + 10*a^2*b^3*x^3 + 5
*a*b^4*x^4 + b^5*x^5)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(60*b*d^5)
```

Maple [C] time = 0.833, size = 2374, normalized size = 13.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] 1/5*B*a^5*n/b*ln(-b*x-a)+1/5*b^4*A*x^5+1/5*b^4*B*ln(e)*x^5+1/5*b^4*B*x^5*ln
((b*x+a)^n)+B*ln(e)*a^4*x-1/2*I*b^3*B*Pi*a*x^4*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^3-I*b^2*B*Pi*a^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*b^2*B*Pi*a^2*x^3
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*b*B*Pi*a^3*x^2*csgn(I*(b*x+a)^n/((d*x+
c)^n))^3-I*b*B*Pi*a^3*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I*B*Pi*a^4*
x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a^4*x*csgn
(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a^4*x*csgn(I*e)*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*a^4*x*csgn(I*(b*x+a)^n/((d*x+c)^
n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+B*a^4*x*ln((b*x+a)^n)-1/5*(b*x+a)^5*B
/b*ln((d*x+c)^n)-1/3*b^3/d*B*a*c*n*x^3-b^2/d*B*a^2*c*n*x^2+1/2*b^3/d^2*B*a*
c^2*n*x^2-2*b/d*B*a^3*c*n*x+b^3*A*a*x^4+2*b^2*A*a^2*x^3+2*b*A*a^3*x^2+A*a^4
*x+1/5/b*B*ln(d*x+c)*a^5*n+b^3*B*ln(e)*a*x^4+b^3*B*a*x^4*ln((b*x+a)^n)+2*b^
2*B*ln(e)*a^2*x^3+2*b^2*B*a^2*x^3*ln((b*x+a)^n)+2*b*B*ln(e)*a^3*x^2+2*b*B*a
^3*x^2*ln((b*x+a)^n)+3/5*b*B*a^3*n*x^2-1/10*b^4/d^3*B*c^3*n*x^2+4/5*B*a^4*n
*x+1/5*b^4/d^4*B*c^4*n*x-1/d*B*ln(d*x+c)*a^4*c*n-1/5*b^4/d^5*B*ln(d*x+c)*c^
5*n-1/10*I*b^4*B*Pi*x^5*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/10*I*b^4*B*Pi*x^5
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*a^4*x*csgn(I*(b*x+a)^n/((d*x+
c)^n))^3-1/2*I*B*Pi*a^4*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*b*B*Pi*a^3*x^
2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*b*B*Pi*a^3*x^2*csgn(I
*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*b*B*Pi*a^3*x^2*csgn(I*(b*x+a)^n/((d
*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/10*I*b^4*B*Pi*x^5*csgn(I*(b*x
+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/10*I*b^4*B*Pi*x^
5*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1
/2*I*b^3*B*Pi*a*x^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2
*I*b^3*B*Pi*a*x^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*b
^3*B*Pi*a*x^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*b^3*B*Pi*a*
x^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*B
*Pi*a^4*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n
))-1/2*I*B*Pi*a^4*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)+1/20*b^3*B*a*n*x^4-1/20*b^4/d*B*c*n*x^4+4/15*b^2*B*a^2*n*x
^3+1/15*b^4/d^2*B*c^2*n*x^3+I*b^2*B*Pi*a^2*x^3*csgn(I/((d*x+c)^n))*csgn(I*(
b*x+a)^n/((d*x+c)^n))^2+I*b^2*B*Pi*a^2*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)
^n/((d*x+c)^n))^2+I*b^2*B*Pi*a^2*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^2+I*b^2*B*Pi*a^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^2+I*b*B*Pi*a^3*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c
)^n))^2+2*b^2/d^2*B*a^2*c^2*n*x-b^3/d^3*B*a*c^3*n*x+2*b/d^2*B*ln(d*x+c)*a^3
```

```
*c^2*n-2*b^2/d^3*B*ln(d*x+c)*a^2*c^3*n+b^3/d^4*B*ln(d*x+c)*a*c^4*n+1/10*I*b
^4*B*Pi*x^5*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/10*I*b^4*
B*Pi*x^5*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/10*I*b^4*B*Pi*
x^5*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/10*I*b^4*B*Pi*x^5*csgn(I*
(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*b^3*B*Pi*a*x
^4*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*b^3*B*Pi*a*x^4*csgn(I*(b*x+a)^n)*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*b^3*B*Pi*a*x^4*csgn(
I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*b^2*B*
Pi*a^2*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^
n))-I*b^2*B*Pi*a^2*x^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)-I*b*B*Pi*a^3*x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))-I*b*B*Pi*a^3*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
```

Maxima [B] time = 1.29535, size = 906, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/5*B*b^4*x^5*log((b*x + a)^n*e/(d*x + c)^n) + 1/5*A*b^4*x^5 + B*a*b^3*x^4*
log((b*x + a)^n*e/(d*x + c)^n) + A*a*b^3*x^4 + 2*B*a^2*b^2*x^3*log((b*x + a
)^n*e/(d*x + c)^n) + 2*A*a^2*b^2*x^3 + 2*B*a^3*b*x^2*log((b*x + a)^n*e/(d*x
 + c)^n) + 2*A*a^3*b*x^2 + B*a^4*x*log((b*x + a)^n*e/(d*x + c)^n) + A*a^4*x
 + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*a^4/e - 2*(a^2*e*n*log(b
*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*B*a^3
*b/e + (2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d
*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*B*a^2
*b^2/e - 1/6*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*
(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2
 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*a*b^3/e + 1/60*(12*a^5*e*n
*log(b*x + a)/b^5 - 12*c^5*e*n*log(d*x + c)/d^5 - (3*(b^4*c*d^3*e*n - a*b^3
*d^4*e*n)*x^4 - 4*(b^4*c^2*d^2*e*n - a^2*b^2*d^4*e*n)*x^3 + 6*(b^4*c^3*d*e*
n - a^3*b*d^4*e*n)*x^2 - 12*(b^4*c^4*e*n - a^4*d^4*e*n)*x)/(b^4*d^4))*B*b^4
/e
```

Fricas [B] time = 1.0928, size = 1188, normalized size = 6.95

$$\frac{12\,Ab^5d^5x^5+3\left(20\,Aab^4d^5-\left(Bb^5cd^4-Bab^4d^5\right)n\right)x^4+4\left(30\,Aa^2b^3d^5+\left(Bb^5c^2d^3-5\,Bab^4cd^4+4\,Ba^2b^3d^5\right)n\right)x^3+6\left(20\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/60*(12*A*b^5*d^5*x^5 + 3*(20*A*a*b^4*d^5 - (B*b^5*c*d^4 - B*a*b^4*d^5)*n)
*x^4 + 4*(30*A*a^2*b^3*d^5 + (B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 + 4*B*a^2*b^3
*d^5)*n)*x^3 + 6*(20*A*a^3*b^2*d^5 - (B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 1
0*B*a^2*b^3*c*d^4 - 6*B*a^3*b^2*d^5)*n)*x^2 + 12*(5*A*a^4*b*d^5 + (B*b^5*c^
4*d - 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 10*B*a^3*b^2*c*d^4 + 4*B*a
^4*b*d^5)*n)*x + 12*(B*b^5*d^5*n*x^5 + 5*B*a*b^4*d^5*n*x^4 + 10*B*a^2*b^3*d
^5*n*x^3 + 10*B*a^3*b^2*d^5*n*x^2 + 5*B*a^4*b*d^5*n*x + B*a^5*d^5*n)*log(b*
x + a) - 12*(B*b^5*d^5*n*x^5 + 5*B*a*b^4*d^5*n*x^4 + 10*B*a^2*b^3*d^5*n*x^3
 + 10*B*a^3*b^2*d^5*n*x^2 + 5*B*a^4*b*d^5*n*x + (B*b^5*c^5 - 5*B*a*b^4*c^4*
d + 10*B*a^2*b^3*c^3*d^2 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*n)*log(d
*x + c) + 12*(B*b^5*d^5*x^5 + 5*B*a*b^4*d^5*x^4 + 10*B*a^2*b^3*d^5*x^3 + 10
*B*a^3*b^2*d^5*x^2 + 5*B*a^4*b*d^5*x)*log(e))/(b*d^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**4*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [B] time = 13.9964, size = 671, normalized size = 3.92

$$\frac{Ba^5n\log\left(bx+a\right)}{5\,b}+\frac{1}{5}\left(Ab^4+Bb^4\right)x^5-\frac{\left(Bb^4cn-Bab^3dn-20\,Aab^3d-20\,Bab^3d\right)x^4}{20\,d}+\frac{\left(Bb^4c^2n-5\,Bab^3cdn+4\,Ba^2b^2d^2\right.}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/5*B*a^5*n*log(b*x + a)/b + 1/5*(A*b^4 + B*b^4)*x^5 - 1/20*(B*b^4*c*n - B*
a*b^3*d*n - 20*A*a*b^3*d - 20*B*a*b^3*d)*x^4/d + 1/15*(B*b^4*c^2*n - 5*B*a*
b^3*c*d*n + 4*B*a^2*b^2*d^2*n + 30*A*a^2*b^2*d^2 + 30*B*a^2*b^2*d^2)*x^3/d^
2 + 1/5*(B*b^4*n*x^5 + 5*B*a*b^3*n*x^4 + 10*B*a^2*b^2*n*x^3 + 10*B*a^3*b*n*
x^2 + 5*B*a^4*n*x)*log(b*x + a) - 1/5*(B*b^4*n*x^5 + 5*B*a*b^3*n*x^4 + 10*B
*a^2*b^2*n*x^3 + 10*B*a^3*b*n*x^2 + 5*B*a^4*n*x)*log(d*x + c) - 1/10*(B*b^4
*c^3*n - 5*B*a*b^3*c^2*d*n + 10*B*a^2*b^2*c*d^2*n - 6*B*a^3*b*d^3*n - 20*A*
a^3*b*d^3 - 20*B*a^3*b*d^3)*x^2/d^3 + 1/5*(B*b^4*c^4*n - 5*B*a*b^3*c^3*d*n
+ 10*B*a^2*b^2*c^2*d^2*n - 10*B*a^3*b*c*d^3*n + 4*B*a^4*d^4*n + 5*A*a^4*d^4
 + 5*B*a^4*d^4)*x/d^4 - 1/5*(B*b^4*c^5*n - 5*B*a*b^3*c^4*d*n + 10*B*a^2*b^2
*c^3*d^2*n - 10*B*a^3*b*c^2*d^3*n + 5*B*a^4*c*d^4*n)*log(-d*x - c)/d^5
```

3.148 $\int (a+bx)^3 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=142

$$\frac{(a+bx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{4b}-\frac{Bnx(bc-ad)^3}{4d^3}+\frac{Bn(a+bx)^2(bc-ad)^2}{8bd^2}+\frac{Bn(bc-ad)^4\log(c+dx)}{4bd^4}-\frac{Bn(\cdots}{\cdots}$$

```
[Out] -(B*(b*c - a*d)^3*n*x)/(4*d^3) + (B*(b*c - a*d)^2*n*(a + b*x)^2)/(8*b*d^2)
- (B*(b*c - a*d)*n*(a + b*x)^3)/(12*b*d) + (B*(b*c - a*d)^4*n*Log[c + d*x])
/(4*b*d^4) + ((a + b*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(4*b)
```

Rubi [A] time = 0.135311, antiderivative size = 154, normalized size of antiderivative = 1.08, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^4}{4b}-\frac{Bnx(bc-ad)^3}{4d^3}+\frac{Bn(a+bx)^2(bc-ad)^2}{8bd^2}+\frac{Bn(bc-ad)^4\log(c+dx)}{4bd^4}+\frac{B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b}\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)^3*n*x)/(4*d^3) + (B*(b*c - a*d)^2*n*(a + b*x)^2)/(8*b*d^2)
- (B*(b*c - a*d)*n*(a + b*x)^3)/(12*b*d) + (A*(a + b*x)^4)/(4*b) + (B*(b*c
- a*d)^4*n*Log[c + d*x])/(4*b*d^4) + (B*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c
+ d*x)^n])/(4*b)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (a+bx)^3\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx &= \int \left(A(a+bx)^3+B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx\\
&= \frac{A(a+bx)^4}{4b}+B\int (a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)dx\\
&= \frac{A(a+bx)^4}{4b}+\frac{B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b}-\frac{(B(bc-ad)n}{4}\\
&= \frac{A(a+bx)^4}{4b}+\frac{B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b}-\frac{(B(bc-ad)n}{}\\
&= -\frac{B(bc-ad)^3nx}{4d^3}+\frac{B(bc-ad)^2n(a+bx)^2}{8bd^2}-\frac{B(bc-ad)n(a+bx)^3}{12bd}+\end{aligned}$$

Mathematica [A] time = 0.472615, size = 273, normalized size = 1.92

$$\frac{bdx\left(9a^2bd^2(4Adx-4Bcn+Bdnx)+6a^3d^3(4A+3Bn)+2ab^2d\left(12Ad^2x^2+Bn\left(12c^2-6cdx+d^2x^2\right)\right)+b^3\left(6Ad^3x^3+\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(6*a^3*d^3*(4*A + 3*B*n) + 9*a^2*b*d^2*(-4*B*c*n + 4*A*d*x + B*d*n*x
) + b^3*(6*A*d^3*x^3 + B*c*n*(-6*c^2 + 3*c*d*x - 2*d^2*x^2)) + 2*a*b^2*d*(1
2*A*d^2*x^2 + B*n*(12*c^2 - 6*c*d*x + d^2*x^2))) - 18*a^4*B*d^4*n*Log[a + b
*x] + 6*B*(b^4*c^4 - 4*a*b^3*c^3*d + 6*a^2*b^2*c^2*d^2 - 4*a^3*b*c*d^3 + 4*
a^4*d^4)*n*Log[c + d*x] + 6*B*d^4*(4*a^4 + 4*a^3*b*x + 6*a^2*b^2*x^2 + 4*a*
b^3*x^3 + b^4*x^4)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(24*b*d^4)
```

Maple [C] time = 0.564, size = 1840, normalized size = 13.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] 3/2*b/d^2*B*ln(d*x+c)*a^2*c^2*n-b^2/d^3*B*ln(d*x+c)*a*c^3*n+1/8*I*b^3*B*Pi*
x^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/8*I*b^3*B*Pi*x^4*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/8*I*b^3*B*Pi*x^4*csgn(I*(b*x+
a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/8*I*b^3*B*Pi*x^4*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/4*B*a^4*n/b*ln(-b*x-a)+B*a^
3*x*ln((b*x+a)^n)-1/4*(b*x+a)^4*B/b*ln((d*x+c)^n)+1/4*b^3*A*x^4+1/4*b^3*B*x
^4*ln((b*x+a)^n)+1/4*b^3*B*ln(e)*x^4+B*ln(e)*a^3*x-1/2*I*b^2*B*Pi*a*x^3*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*b^2*B*Pi*a*x^3*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^3-3/4*I*b*B*Pi*a^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-3/4*I*b*B*Pi*
a^2*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I*B*Pi*a^3*x*csgn(I*e)*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)^2+b^2*A*a*x^3+3/2*b*A*a^2*x^2+A*a^3*x+b^2*B*a*x^3
*ln((b*x+a)^n)+b^2*B*ln(e)*a*x^3+3/2*b*B*a^2*x^2*ln((b*x+a)^n)+3/2*b*B*ln(e
)*a^2*x^2+1/4/b*B*ln(d*x+c)*a^4*n+1/12*b^2*B*a*n*x^3-1/12*b^3/d*B*c*n*x^3-1
/2*I*B*Pi*a^3*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/8*I*b^3*B*Pi*x^4*csgn(I
*(b*x+a)^n/((d*x+c)^n))^3-1/8*I*b^3*B*Pi*x^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^3-1/8*I*b^3*B*Pi*x^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)-1/8*I*b^3*B*Pi*x^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n)
)*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/2*I*b^2*B*Pi*a*x^3*csgn(I*e)*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2+1/2*I*b^2*B*Pi*a*x^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))^2+1/2*I*b^2*B*Pi*a*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n
/((d*x+c)^n))^2+1/2*I*b^2*B*Pi*a*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*b^2*B*Pi*a*x^3*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*b^2*B*Pi*a*x^3*csgn(I*(b*
x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-3/4*I*b*B*Pi*a^2*
x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
-3/4*I*b*B*Pi*a^2*x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^
n/((d*x+c)^n))-1/2*b^2/d*B*a*c*n*x^2+3/4*I*b*B*Pi*a^2*x^2*csgn(I*e)*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^2+3/4*I*b*B*Pi*a^2*x^2*csgn(I/((d*x+c)^n))*csgn(I*
(b*x+a)^n/((d*x+c)^n))^2+3/4*I*b*B*Pi*a^2*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x
+a)^n/((d*x+c)^n))^2+3/4*I*b*B*Pi*a^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csg
n(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*B*Pi*a^3*x*csgn(I*e)*csgn(I*(b*x+a)^n/
((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*a^3*x*csgn(I*(b*x+a
)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-3/2*b/d*B*a^2*c*n*x+
b^2/d^2*B*a*c^2*n*x+3/8*b*B*a^2*n*x^2+1/8*b^3/d^2*B*c^2*n*x^2+3/4*B*a^3*n*x
-1/4*b^3/d^3*B*c^3*n*x-1/d*B*ln(d*x+c)*a^3*c*n+1/4*b^3/d^4*B*ln(d*x+c)*c^4*
n-1/2*I*B*Pi*a^3*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I*B*Pi*a^3*x*csgn(I/
((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a^3*x*csgn(I*(b*x+a
)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*a^3*x*csgn(I*(b*x+a)^n/((d*
x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2
```

Maxima [B] time = 1.24692, size = 630, normalized size = 4.44

$$\frac{1}{4}Bb^3x^4\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{4}Ab^3x^4+Bab^2x^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aab^2x^3+\frac{3}{2}Ba^2bx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{3}{2}Aa^2bx^2+B$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/4*B*b^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A*b^3*x^4 + B*a*b^2*x^3*
log((b*x + a)^n*e/(d*x + c)^n) + A*a*b^2*x^3 + 3/2*B*a^2*b*x^2*log((b*x + a
)^n*e/(d*x + c)^n) + 3/2*A*a^2*b*x^2 + B*a^3*x*log((b*x + a)^n*e/(d*x + c)^
n) + A*a^3*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*a^3/e - 3/2*
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*a^2*b/e + 1/2*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x +
c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x
)/(b^2*d^2))*B*a*b^2/e - 1/24*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d
*x + c)/d^4 + (2*(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a
^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*b^3/e
```

Fricas [B] time = 1.06623, size = 871, normalized size = 6.13

$$\frac{6\,Ab^4d^4x^4+2\left(12\,Aab^3d^4-\left(Bb^4cd^3-Bab^3d^4\right)n\right)x^3+3\left(12\,Aa^2b^2d^4+\left(Bb^4c^2d^2-4\,Bab^3cd^3+3\,Ba^2b^2d^4\right)n\right)x^2+6\left(4\,A\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/24*(6*A*b^4*d^4*x^4 + 2*(12*A*a*b^3*d^4 - (B*b^4*c*d^3 - B*a*b^3*d^4)*n)*
x^3 + 3*(12*A*a^2*b^2*d^4 + (B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 + 3*B*a^2*b^2*
d^4)*n)*x^2 + 6*(4*A*a^3*b*d^4 - (B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2
*b^2*c*d^3 - 3*B*a^3*b*d^4)*n)*x + 6*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3
 + 6*B*a^2*b^2*d^4*n*x^2 + 4*B*a^3*b*d^4*n*x + B*a^4*d^4*n)*log(b*x + a) -
6*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2*b^2*d^4*n*x^2 + 4*B*a^3*
b*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*
c*d^3)*n)*log(d*x + c) + 6*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2
```

```
*d^4*x^2 + 4*B*a^3*b*d^4*x)*log(e))/(b*d^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [B] time = 5.42466, size = 479, normalized size = 3.37

$$\frac{Ba^4n\log(bx+a)}{4b}+\frac{1}{4}\left(Ab^3+Bb^3\right)x^4-\frac{\left(Bb^3cn-Bab^2dn-12\,Aab^2d-12\,Bab^2d\right)x^3}{12\,d}+\frac{1}{4}\left(Bb^3nx^4+4\,Bab^2nx^3+6\,Ba^2bn\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/4*B*a^4*n*log(b*x + a)/b + 1/4*(A*b^3 + B*b^3)*x^4 - 1/12*(B*b^3*c*n - B*
a*b^2*d*n - 12*A*a*b^2*d - 12*B*a*b^2*d)*x^3/d + 1/4*(B*b^3*n*x^4 + 4*B*a*b
^2*n*x^3 + 6*B*a^2*b*n*x^2 + 4*B*a^3*n*x)*log(b*x + a) - 1/4*(B*b^3*n*x^4 +
 4*B*a*b^2*n*x^3 + 6*B*a^2*b*n*x^2 + 4*B*a^3*n*x)*log(d*x + c) + 1/8*(B*b^3
*c^2*n - 4*B*a*b^2*c*d*n + 3*B*a^2*b*d^2*n + 12*A*a^2*b*d^2 + 12*B*a^2*b*d^
2)*x^2/d^2 - 1/4*(B*b^3*c^3*n - 4*B*a*b^2*c^2*d*n + 6*B*a^2*b*c*d^2*n - 3*B
*a^3*d^3*n - 4*A*a^3*d^3 - 4*B*a^3*d^3)*x/d^3 + 1/4*(B*b^3*c^4*n - 4*B*a*b^
2*c^3*d*n + 6*B*a^2*b*c^2*d^2*n - 4*B*a^3*c*d^3*n)*log(d*x + c)/d^4
```

3.149 $\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=113

$$\frac{(a+bx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{3b}+\frac{Bnx(bc-ad)^2}{3d^2}-\frac{Bn(bc-ad)^3\log(c+dx)}{3bd^3}-\frac{Bn(a+bx)^2(bc-ad)}{6bd}$$

```
[Out] (B*(b*c - a*d)^2*n*x)/(3*d^2) - (B*(b*c - a*d)*n*(a + b*x)^2)/(6*b*d) - (B*
(b*c - a*d)^3*n*Log[c + d*x])/(3*b*d^3) + ((a + b*x)^3*(A + B*Log[(e*(a + b
*x)^n)/(c + d*x)^n]))/(3*b)
```

Rubi [A] time = 0.120999, antiderivative size = 125, normalized size of antiderivative = 1.11, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^3}{3b}+\frac{Bnx(bc-ad)^2}{3d^2}-\frac{Bn(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b}-\frac{Bn(a+bx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (B*(b*c - a*d)^2*n*x)/(3*d^2) - (B*(b*c - a*d)*n*(a + b*x)^2)/(6*b*d) + (A*
(a + b*x)^3)/(3*b) - (B*(b*c - a*d)^3*n*Log[c + d*x])/(3*b*d^3) + (B*(a + b
*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx = \int \left(A(a+bx)^2 + B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$$
$$= \frac{A(a+bx)^3}{3b} + B\int (a+bx)^2 \log\left(e(a+bx)^n(c+dx)^{-n}\right) dx$$
$$= \frac{A(a+bx)^3}{3b} + \frac{B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b} - \frac{(B(bc-ad)n)}{3b}$$
$$= \frac{A(a+bx)^3}{3b} + \frac{B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b} - \frac{(B(bc-ad)n)}{}$$
$$= \frac{B(bc-ad)^2nx}{3d^2} - \frac{B(bc-ad)n(a+bx)^2}{6bd} + \frac{A(a+bx)^3}{3b} - \frac{B(bc-ad)^3n}{3bd}$$

Mathematica [A] time = 0.281757, size = 194, normalized size = 1.72

$$\frac{bdx\left(2a^2d^2(3A+2Bn)+abd(6Adx-6Bcn+Bdnx)+b^2\left(2Ad^2x^2+Bcn(2c-dx)\right)\right)-2Bn\left(3a^2bcd^2-3a^3d^3-3ab^2c^2d+\right.}{6bd^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(2*a^2*d^2*(3*A + 2*B*n) + a*b*d*(-6*B*c*n + 6*A*d*x + B*d*n*x) + b^
2*(2*A*d^2*x^2 + B*c*n*(2*c - d*x))) - 4*a^3*B*d^3*n*Log[a + b*x] - 2*B*(b^
3*c^3 - 3*a*b^2*c^2*d + 3*a^2*b*c*d^2 - 3*a^3*d^3)*n*Log[c + d*x] + 2*B*d^3
*(3*a^3 + 3*a^2*b*x + 3*a*b^2*x^2 + b^3*x^3)*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/(6*b*d^3)
```

Maple [C] time = 0.527, size = 1325, normalized size = 11.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] -1/3*(b*x+a)^3*B/b*ln((d*x+c)^n)+B*a^2*x*ln((b*x+a)^n)+1/3*B*a^3*n/b*ln(-b*
x-a)+1/3*b^2*A*x^3+1/3*b^2*B*ln(e)*x^3+1/3*b^2*B*x^3*ln((b*x+a)^n)+B*ln(e)*
a^2*x+b*A*a*x^2+A*a^2*x+b*B*ln(e)*a*x^2+b*B*a*x^2*ln((b*x+a)^n)+1/3/b*B*ln(
d*x+c)*a^3*n+1/6*I*b^2*B*Pi*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)
^n))^2+1/6*I*b^2*B*Pi*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n
)*(b*x+a)^n)^2+1/6*I*b^2*B*Pi*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
^2+1/2*I*B*Pi*a^2*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2
*I*B*Pi*a^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*
a^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I
*B*Pi*a^2*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*b*B*Pi*a*x^2*
csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*b*B*Pi*a*x^2*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^3+1/6*b*B*a*n*x^2-1/6*b^2/d*B*c*n*x^2+2/3*B*a^2*n*x+1/3*b^2/d^2*B*c
^2*n*x-1/3*b^2/d^3*B*ln(d*x+c)*c^3*n-1/d*B*ln(d*x+c)*a^2*c*n-1/6*I*b^2*B*Pi
*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/6*I*b^2*B*Pi*x^3*csgn(I*e/((d*x+c)^n
)*(b*x+a)^n)^3-1/2*I*B*Pi*a^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*
a^2*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*b*B*Pi*a*x^2*csgn(I*e)*csgn(I
*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*b*B*Pi*a*x^2*
csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-b/d*B*a
*c*n*x+b/d^2*B*ln(d*x+c)*a*c^2*n+1/6*I*b^2*B*Pi*x^3*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*b*B*Pi*a*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b
*x+a)^n/((d*x+c)^n))^2+1/2*I*b*B*Pi*a*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csg
n(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*b*B*Pi*a*x^2*csgn(I*e)*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^2-1/2*I*B*Pi*a^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*a^2*x*csgn(I*(b*x+a)^n)*csgn(I/
((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/6*I*b^2*B*Pi*x^3*csgn(I*e)*csg
n(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/6*I*b^2*B*Pi*x
^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/2*
I*b*B*Pi*a*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
```

Maxima [B] time = 1.28175, size = 397, normalized size = 3.51

$$\frac{1}{3}Bb^2x^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{3}Ab^2x^3+Babx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aabx^2+Ba^2x\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aa^2x+\frac{\left(\frac{aen\log(bx+a)}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/3*B*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A*b^2*x^3 + B*a*b*x^2*lo
g((b*x + a)^n*e/(d*x + c)^n) + A*a*b*x^2 + B*a^2*x*log((b*x + a)^n*e/(d*x +
 c)^n) + A*a^2*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*a^2/e -
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*a*b/e + 1/6*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)
/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/
(b^2*d^2))*B*b^2/e
```

Fricas [B] time = 1.04023, size = 599, normalized size = 5.3

$$\frac{2 \, A b^{3} d^{3} x^{3} + \left(6 \, A a b^{2} d^{3} - \left(B b^{3} c d^{2} - B a b^{2} d^{3}\right) n\right) x^{2} + 2 \, \left(3 \, A a^{2} b d^{3} + \left(B b^{3} c^{2} d - 3 \, B a b^{2} c d^{2} + 2 \, B a^{2} b d^{3}\right) n\right) x + 2 \, \left(B b^{3} d^{3} n x^{3} + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/6*(2*A*b^3*d^3*x^3 + (6*A*a*b^2*d^3 - (B*b^3*c*d^2 - B*a*b^2*d^3)*n)*x^2
+ 2*(3*A*a^2*b*d^3 + (B*b^3*c^2*d - 3*B*a*b^2*c*d^2 + 2*B*a^2*b*d^3)*n)*x +
 2*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x + B*a^3*d^3*n
)*log(b*x + a) - 2*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n
*x + (B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log(d*x + c) + 2*(B
*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x^2 + 3*B*a^2*b*d^3*x)*log(e))/(b*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [B] time = 2.29535, size = 317, normalized size = 2.81

$$\frac{B a^{3} n \log\left(b x + a\right)}{3 \, b} + \frac{1}{3} \, \left(A b^{2} + B b^{2}\right) x^{3} - \frac{\left(B b^{2} c n - B a b d n - 6 \, A a b d - 6 \, B a b d\right) x^{2}}{6 \, d} + \frac{1}{3} \, \left(B b^{2} n x^{3} + 3 \, B a b n x^{2} + 3 \, B a^{2} n x\right) \log\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/3*B*a^3*n*log(b*x + a)/b + 1/3*(A*b^2 + B*b^2)*x^3 - 1/6*(B*b^2*c*n - B*a
*b*d*n - 6*A*a*b*d - 6*B*a*b*d)*x^2/d + 1/3*(B*b^2*n*x^3 + 3*B*a*b*n*x^2 +
3*B*a^2*n*x)*log(b*x + a) - 1/3*(B*b^2*n*x^3 + 3*B*a*b*n*x^2 + 3*B*a^2*n*x)
*log(d*x + c) + 1/3*(B*b^2*c^2*n - 3*B*a*b*c*d*n + 2*B*a^2*d^2*n + 3*A*a^2*
d^2 + 3*B*a^2*d^2)*x/d^2 - 1/3*(B*b^2*c^3*n - 3*B*a*b*c^2*d*n + 3*B*a^2*c*d
^2*n)*log(-d*x - c)/d^3
```

3.150 $\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx$

Optimal. Leaf size=84

$$\frac{(a+bx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{2b}+\frac{Bn(bc-ad)^2\log(c+dx)}{2bd^2}-\frac{Bnx(bc-ad)}{2d}$$

```
[Out] -(B*(b*c - a*d)*n*x)/(2*d) + (B*(b*c - a*d)^2*n*Log[c + d*x])/(2*b*d^2) + (
(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*b)
```

Rubi [A] time = 0.0908031, antiderivative size = 96, normalized size of antiderivative = 1.14, number of steps used = 5, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {6742, 2492, 43}

$$\frac{A(a+bx)^2}{2b}+\frac{Bn(bc-ad)^2\log(c+dx)}{2bd^2}+\frac{B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b}-\frac{Bnx(bc-ad)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*n*x)/(2*d) + (A*(a + b*x)^2)/(2*b) + (B*(b*c - a*d)^2*n*Log
[c + d*x])/(2*b*d^2) + (B*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*
b)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx = \int \left(A(a+bx)+B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)dx$$
$$= \frac{A(a+bx)^2}{2b} + B\int (a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)dx$$
$$= \frac{A(a+bx)^2}{2b} + \frac{B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} - \frac{(B(bc-ad)n)}{2b}$$
$$= \frac{A(a+bx)^2}{2b} + \frac{B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} - \frac{(B(bc-ad)n)}{}$$
$$= -\frac{B(bc-ad)nx}{2d} + \frac{A(a+bx)^2}{2b} + \frac{B(bc-ad)^2n\log(c+dx)}{2bd^2} + \frac{B(a+b}{}$$

Mathematica [A] time = 0.146117, size = 126, normalized size = 1.5

$$\frac{d\left(Bd\left(2a^2+2abx+b^2x^2\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+bx(2aAd+aBdn+Abdx-bBcn)\right)+Bn\left(2a^2d^2-2abcd+b^2c^2\right)}{2bd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (-(a^2*B*d^2*n*Log[a + b*x]) + B*(b^2*c^2 - 2*a*b*c*d + 2*a^2*d^2)*n*Log[c
+ d*x] + d*(b*x*(2*a*A*d - b*B*c*n + a*B*d*n + A*b*d*x) + B*d*(2*a^2 + 2*a*
b*x + b^2*x^2)*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*b*d^2)
```

Maple [C] time = 0.51, size = 817, normalized size = 9.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] 1/2*A*b*x^2+A*a*x+1/2*B*a^2*n/b*ln(-b*x-a)+1/2*b*B*x^2*ln((b*x+a)^n)+1/2*B*
ln(e)*b*x^2+B*ln(e)*a*x-1/2*B*x*(b*x+2*a)*ln((d*x+c)^n)+1/2*B*n*a*x+B*a*x*l
n((b*x+a)^n)-1/2*I*B*Pi*a*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*a*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n
))*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/4*I*b*B*Pi*x^2*csgn(I*e)*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^2+1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^2+1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^
n/((d*x+c)^n))^2+1/4*I*b*B*Pi*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*
x+c)^n))^2+1/2*I*B*Pi*a*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I
*B*Pi*a*x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1
/2*I*B*Pi*a*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*
a*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*b/d*B*c*n*x-1/d
*B*ln(d*x+c)*a*c*n+1/2*b/d^2*B*ln(d*x+c)*c^2*n-1/4*I*b*B*Pi*x^2*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^3-1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2
*I*B*Pi*a*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*a*x*csgn(I*(b*x+a)
^n/((d*x+c)^n))^3-1/4*I*b*B*Pi*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/4*I*b*B*Pi*x^2*csgn(I*(b*x+a)^n)*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
```

Maxima [A] time = 1.15689, size = 208, normalized size = 2.48

$$\frac{1}{2}Bbx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{2}Abx^2+Bax\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aax+\frac{\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)Ba}{e}-\frac{\left(\frac{a^2en\log(bx+a)}{b^2}-\frac{c^2en\log\ldots}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima")
```

```
[Out] 1/2*B*b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A*b*x^2 + B*a*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A*a*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d
)*B*a/e - 1/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e
*n - a*d*e*n)*x/(b*d))*B*b/e
```

Fricas [B] time = 1.07428, size = 354, normalized size = 4.21

$$\frac{Ab^2d^2x^2+\left(2\,Aabd^2-\left(Bb^2cd-Babd^2\right)n\right)x+\left(Bb^2d^2nx^2+2\,Babd^2nx+Ba^2d^2n\right)\log\left(bx+a\right)-\left(Bb^2d^2nx^2+2\,Babd^2nx+\ldots\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*x^2 + (2*A*a*b*d^2 - (B*b^2*c*d - B*a*b*d^2)*n)*x + (B*b^2*d
^2*n*x^2 + 2*B*a*b*d^2*n*x + B*a^2*d^2*n)*log(b*x + a) - (B*b^2*d^2*n*x^2 +
 2*B*a*b*d^2*n*x - (B*b^2*c^2 - 2*B*a*b*c*d)*n)*log(d*x + c) + (B*b^2*d^2*x
^2 + 2*B*a*b*d^2*x)*log(e))/(b*d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.70434, size = 171, normalized size = 2.04

$$\frac{Ba^2n\log(bx+a)}{2\,b} + \frac{1}{2}(Ab+Bb)x^2 + \frac{1}{2}\left(Bbnx^2 + 2\,Banx\right)\log(bx+a) - \frac{1}{2}\left(Bbnx^2 + 2\,Banx\right)\log(dx+c) - \frac{(Bbcn - Ba}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/2*B*a^2*n*log(b*x + a)/b + 1/2*(A*b + B*b)*x^2 + 1/2*(B*b*n*x^2 + 2*B*a*n
*x)*log(b*x + a) - 1/2*(B*b*n*x^2 + 2*B*a*n*x)*log(d*x + c) - 1/2*(B*b*c*n
- B*a*d*n - 2*A*a*d - 2*B*a*d)*x/d + 1/2*(B*b*c^2*n - 2*B*a*c*d*n)*log(d*x
+ c)/d^2
```

3.151 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{a+bx}\,dx$

Optimal. Leaf size=79

$$\frac{Bn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)}{b}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
]))/b) + (B*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b
```

Rubi [A] time = 0.26782, antiderivative size = 87, normalized size of antiderivative = 1.1, number of steps used = 7, number of rules used = 6, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {6742, 2488, 2411, 2343, 2333, 2315}

$$\frac{Bn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}+\frac{A\log(a+bx)}{b}-\frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x),x]
```

```
[Out] (A*Log[a + b*x])/b - (B*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b + (B*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\,dx = \int \left(\frac{A}{a+bx}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\right)dx$$
$$= \frac{A\log(a+bx)}{b} + B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{a+bx}\,dx$$
$$= \frac{A\log(a+bx)}{b} - \frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{(B(bc-ad)n)\int}{b}$$
$$= \frac{A\log(a+bx)}{b} - \frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{(B(bc-ad)n)\,\mathrm{Su}}{}$$
$$= \frac{A\log(a+bx)}{b} - \frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} - \frac{(B(bc-ad)n)\,\mathrm{Su}}{}$$
$$= \frac{A\log(a+bx)}{b} - \frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} - \frac{(B(bc-ad)n)\,\mathrm{Su}}{}$$
$$= \frac{A\log(a+bx)}{b} - \frac{B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{Bn\mathrm{Li}_2\left(\frac{b(c+dx)}{d(a+bx)}\right)}{b}$$

Mathematica [A] time = 0.0972473, size = 129, normalized size = 1.63

$$\frac{2Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2A\log(a+bx)-2B\log\left(\frac{ad-bc}{d(a+bx)}\right)\left(\log\left(e(a+bx)^n(c+dx)^{-n}\right)+n\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-Bn\log^2\left(\frac{ad-}{d(a-}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x),x]
```

```
[Out] (-(B*n*Log[(-(b*c) + a*d)/(d*(a + b*x))]^2) + 2*A*Log[a + b*x] - 2*B*Log[(-
(b*c) + a*d)/(d*(a + b*x))]*(n*Log[(b*(c + d*x))/(b*c - a*d)] + Log[(e*(a +
 b*x)^n)/(c + d*x)^n]) + 2*B*n*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])/(2
*b)
```

Maple [C] time = 1.534, size = 523, normalized size = 6.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x)
```

```
[Out] -B/b*ln(b*x+a)*ln((d*x+c)^n)+1/b*B*n*dilog((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))
+1/b*B*n*ln(b*x+a)*ln((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))+1/2*I/b*B*ln(b*x+a)*
Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/b*B*ln(b*x+a)*Pi*csgn(
I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I/b*B*ln(b*x
+a)*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I/b*B*ln(b*x+a
)*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+A*ln(b*x+a)/b+1/b*
B*ln(b*x+a)*ln(e)+1/2/b*B/n*ln((b*x+a)^n)^2-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*(b*x+a)^n/((d*x+c)^
n))^3-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I/b*B*ln(b*x+a)*Pi*csgn(I*(b*x+a)^n)*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$B\left(\frac{\log(bx+a)\log\left((bx+a)^n\right)-\log(bx+a)\log\left((dx+c)^n\right)}{b}+\int\frac{bdx\log(e)+bc\log(e)-(bcn-adn)\log(bx+a)}{b^2dx^2+abc+\left(b^2c+abd\right)x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x, algorithm="maxima")
```

```
[Out] B*((log(b*x + a)*log((b*x + a)^n) - log(b*x + a)*log((d*x + c)^n))/b + inte
grate((b*d*x*log(e) + b*c*log(e) - (b*c*n - a*d*n)*log(b*x + a))/(b^2*d*x^2
 + a*b*c + (b^2*c + a*b*d)*x), x)) + A*log(b*x + a)/b
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{bx+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*x + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A}{bx + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(b*x + a), x)
```

3.152 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^2}\,dx$

Optimal. Leaf size=97

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{b(a+bx)}-\frac{Bdn\log(a+bx)}{b(bc-ad)}+\frac{Bdn\log(c+dx)}{b(bc-ad)}-\frac{Bn}{b(a+bx)}$$

```
[Out] -((B*n)/(b*(a + b*x))) - (B*d*n*Log[a + b*x])/(b*(b*c - a*d)) + (B*d*n*Log[
c + d*x])/(b*(b*c - a*d)) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*(a
+ b*x))
```

Rubi [A] time = 0.0835585, antiderivative size = 72, normalized size of antiderivative = 0.74, number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2490, 32}

$$-\frac{A}{b(a+bx)}-\frac{B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{Bn}{b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^2,x]
```

```
[Out] -(A/(b*(a + b*x))) - (B*n)/(b*(a + b*x)) - (B*(c + d*x)*Log[(e*(a + b*x)^n)
/(c + d*x)^n])/((b*c - a*d)*(a + b*x))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\,dx &= \int \left(\frac{A}{(a+bx)^2}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\right)dx \\
&= -\frac{A}{b(a+bx)}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}\,dx \\
&= -\frac{A}{b(a+bx)}-\frac{B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)}+(Bn)\int \frac{1}{(a+bx)^2}\,dx \\
&= -\frac{A}{b(a+bx)}-\frac{Bn}{b(a+bx)}-\frac{B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bc-ad)(a+bx)}
\end{aligned}$$

Mathematica [A] time = 0.0895557, size = 89, normalized size = 0.92

$$\frac{-(bc-ad)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A+Bn\right)+Bdn(a+bx)\log(c+dx)-Bdn(a+bx)\log(a+bx)}{b(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^2,x]
```

```
[Out] (-(B*d*n*(a + b*x)*Log[a + b*x]) + B*d*n*(a + b*x)*Log[c + d*x] - (b*c - a*
d)*(A + B*n + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b*(b*c - a*d)*(a + b*x)
)
```

Maple [C] time = 0.4, size = 823, normalized size = 8.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x)
```

```
[Out] B/b/(b*x+a)*ln((d*x+c)^n)-1/2*(-2*A*a*d-2*B*a*d*n+2*B*b*c*n+2*A*b*c-2*B*ln(
d*x+c)*a*d*n+2*B*ln(-b*x-a)*a*d*n+2*B*b*c*ln((b*x+a)^n)-2*B*a*d*ln((b*x+a)^
n)-I*B*Pi*b*c*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*
```

```
(b*x+a)^n)-I*B*Pi*b*c*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^
n/((d*x+c)^n))+2*B*ln(e)*b*c-2*B*ln(e)*a*d+I*B*Pi*a*d*csgn(I*e)*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*a*d*csgn(I*(b*x+a
)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*B*Pi*a*d*csgn(I*(b
*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a*d*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a*d*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(
I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*a*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^2+I*B*Pi*b*c*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*b*c*
csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a*d*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^3+I*B*Pi*b*c*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c
)^n))^2-2*B*ln(d*x+c)*b*d*n*x+2*B*ln(-b*x-a)*b*d*n*x-I*B*Pi*b*c*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^3+I*B*Pi*a*d*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B*Pi*b*
c*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*b*c*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2)/(b*x+a)/b/(-a*d+b*c)
```

Maxima [A] time = 1.18632, size = 157, normalized size = 1.62

$$-\frac{\left(\frac{den\log(bx+a)}{b^2c-abd}-\frac{den\log(dx+c)}{b^2c-abd}+\frac{en}{b^2x+ab}\right)B}{e}-\frac{B\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)}{b^2x+ab}-\frac{A}{b^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x, algorithm="maxima
")
```

```
[Out] -(d*e*n*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) +
 e*n/(b^2*x + a*b))*B/e - B*log((b*x + a)^n*e/(d*x + c)^n)/(b^2*x + a*b) -
A/(b^2*x + a*b)
```

Fricas [A] time = 1.06594, size = 242, normalized size = 2.49

$$-\frac{Abc-Aad+(Bbc-Bad)n+(Bbdnx+Bbcn)\log(bx+a)-(Bbdnx+Bbcn)\log(dx+c)+(Bbc-Bad)\log(e)}{ab^2c-a^2bd+\left(b^3c-ab^2d\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x, algorithm="fricas
")
```

```
[Out] -(A*b*c - A*a*d + (B*b*c - B*a*d)*n + (B*b*d*n*x + B*b*c*n)*log(b*x + a) -
(B*b*d*n*x + B*b*c*n)*log(d*x + c) + (B*b*c - B*a*d)*log(e))/(a*b^2*c - a^2
*b*d + (b^3*c - a*b^2*d)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.26185, size = 146, normalized size = 1.51

$$-\frac{Bdn\log(bx+a)}{b^2c-abd}+\frac{Bdn\log(dx+c)}{b^2c-abd}-\frac{Bn\log(bx+a)}{b^2x+ab}+\frac{Bn\log(dx+c)}{b^2x+ab}-\frac{Bn+A+B}{b^2x+ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] -B*d*n*log(b*x + a)/(b^2*c - a*b*d) + B*d*n*log(d*x + c)/(b^2*c - a*b*d) -
B*n*log(b*x + a)/(b^2*x + a*b) + B*n*log(d*x + c)/(b^2*x + a*b) - (B*n + A
+ B)/(b^2*x + a*b)
```

3.153 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3}\,dx$

Optimal. Leaf size=137

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{2b(a+bx)^2}+\frac{Bd^2n\log(a+bx)}{2b(bc-ad)^2}-\frac{Bd^2n\log(c+dx)}{2b(bc-ad)^2}+\frac{Bdn}{2b(a+bx)(bc-ad)}-\frac{Bn}{4b(a+bx)^2}$$

```
[Out] -(B*n)/(4*b*(a + b*x)^2) + (B*d*n)/(2*b*(b*c - a*d)*(a + b*x)) + (B*d^2*n*L
og[a + b*x])/(2*b*(b*c - a*d)^2) - (B*d^2*n*Log[c + d*x])/(2*b*(b*c - a*d)^
2) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(a + b*x)^2)
```

Rubi [A] time = 0.154141, antiderivative size = 149, normalized size of antiderivative = 1.09, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 44}

$$-\frac{A}{2b(a+bx)^2}+\frac{Bd^2n\log(a+bx)}{2b(bc-ad)^2}-\frac{Bd^2n\log(c+dx)}{2b(bc-ad)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2}+\frac{Bdn}{2b(a+bx)(bc-ad)}-\frac{Bn}{4b(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^3,x]
```

```
[Out] -A/(2*b*(a + b*x)^2) - (B*n)/(4*b*(a + b*x)^2) + (B*d*n)/(2*b*(b*c - a*d)*(
a + b*x)) + (B*d^2*n*Log[a + b*x])/(2*b*(b*c - a*d)^2) - (B*d^2*n*Log[c + d
*x])/(2*b*(b*c - a*d)^2) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(a + b
*x)^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\,dx &= \int \left(\frac{A}{(a+bx)^3}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\right)dx\\ &= -\frac{A}{2b(a+bx)^2}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}\,dx\\ &= -\frac{A}{2b(a+bx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^3(c+dx)}\,dx}{2b}\\ &= -\frac{A}{2b(a+bx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b(a+bx)^2}+\frac{(B(bc-ad)n)\int \left(\frac{b}{(bc-ad)(a+bx)^3}-\right.}{}\\ &= -\frac{A}{2b(a+bx)^2}-\frac{Bn}{4b(a+bx)^2}+\frac{Bdn}{2b(bc-ad)(a+bx)}+\frac{Bd^2n\log(a+bx)}{2b(bc-ad)^2}-\frac{Bd^2n}{2b(}\end{aligned}$$

Mathematica [A] time = 0.338144, size = 121, normalized size = 0.88

$$-\frac{\frac{2A}{(a+bx)^2}+Bn\left(-\frac{2d^2\log(a+bx)}{(bc-ad)^2}+\frac{2d^2\log(c+dx)}{(bc-ad)^2}+\frac{\frac{2d(a+bx)}{ad-bc}+1}{(a+bx)^2}\right)+\frac{2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^2}}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^3,x]
```

```
[Out] -((2*A)/(a + b*x)^2 + B*n*((1 + (2*d*(a + b*x))/(-(b*c) + a*d))/(a + b*x)^2
 - (2*d^2*Log[a + b*x])/(b*c - a*d)^2 + (2*d^2*Log[c + d*x])/(b*c - a*d)^2)
 + (2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^2)/(4*b)
```

Maple [C] time = 0.425, size = 1379, normalized size = 10.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x)
```

```
[Out] 1/2*B/b/(b*x+a)^2*ln((d*x+c)^n)-1/4*(2*I*B*Pi*a*b*c*d*csgn(I*e)*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*a^2*d^2*csgn(I*(b
*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a^2*d^2*csgn(I*(b*x+a)^n)*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*a*b*c*d*csgn(I*(b
*x+a)^n/((d*x+c)^n))^3+2*I*B*Pi*a*b*c*d*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I
*B*Pi*b^2*c^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)-4*A*a*b*c*d-I*B*Pi*b^2*c^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))
*csgn(I*(b*x+a)^n/((d*x+c)^n))+2*B*ln(e)*a^2*d^2+2*B*ln(e)*b^2*c^2+2*A*a^2*
d^2+2*A*b^2*c^2+2*B*ln(d*x+c)*a^2*d^2*n+3*B*a^2*d^2*n+B*c^2*n*b^2-2*B*a^2*n
*ln(-b*x-a)*d^2+I*B*Pi*b^2*c^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+
I*B*Pi*b^2*c^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2
*c^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a^2*d^2*csg
n(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*B*b^
2*c^2*ln((b*x+a)^n)+2*B*a^2*d^2*ln((b*x+a)^n)-2*I*B*Pi*a*b*c*d*csgn(I*(b*x+
a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi*a*b*c*d*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*B*b^2*c*d*n*x+2*B*a*b*d^2*n*x-4*B*a*c*d*n
*b-4*B*ln(e)*a*b*c*d-I*B*Pi*a^2*d^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*B*P
i*b^2*c^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B*Pi*b^2*c^2*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)^3-2*I*B*Pi*a*b*c*d*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*b^2*c^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*a^2*d^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^2-4*B*ln(-b*x-a)*a*b*d^2*n*x+4*B*ln(d*x+c)*a*b*d^2*n*x-4*B*a*b*c*d*
ln((b*x+a)^n)-I*B*Pi*a^2*d^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-2*B*ln(-b*x-a)
*b^2*d^2*n*x^2+2*B*ln(d*x+c)*b^2*d^2*n*x^2+I*B*Pi*a^2*d^2*csgn(I/((d*x+c)^n
))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a^2*d^2*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*a*b*c*d*csgn(I*e)*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^2+2*I*B*Pi*a*b*c*d*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)
^n))*csgn(I*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^2/(-a*d+b*c)^2/b
```

Maxima [A] time = 1.14743, size = 311, normalized size = 2.27

$$\frac{\left(\frac{2\,d^2en\log(bx+a)}{b^3c^2-2\,ab^2cd+a^2bd^2}-\frac{2\,d^2en\log(dx+c)}{b^3c^2-2\,ab^2cd+a^2bd^2}+\frac{2\,bdenx-bcen+3\,aden}{a^2b^2c-a^3bd+\left(b^4c-ab^3d\right)x^2+2\left(ab^3c-a^2b^2d\right)x}\right)B}{4\,e}-\frac{B\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)}{2\left(b^3x^2+2\,ab^2x+a^2b\right)}-\frac{A}{2\left(b^3x^2+2\,ab^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x, algorithm="maxima
```

```
")
```

```
[Out] 1/4*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*d^2*e*n
*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b*c*e*n
+ 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*x))*B/e - 1/2*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^3*x^2 + 2*a*b^2*
x + a^2*b) - 1/2*A/(b^3*x^2 + 2*a*b^2*x + a^2*b)
```

Fricas [B] time = 1.04422, size = 639, normalized size = 4.66

$$-\frac{2\,Ab^2c^2-4\,Aabcd+2\,Aa^2d^2-2\left(Bb^2cd-Babd^2\right)nx+\left(Bb^2c^2-4\,Babcd+3\,Ba^2d^2\right)n-2\left(Bb^2d^2nx^2+2\,Babd^2nx-\left(Bb\right.\right.}{4\left(a^2b^3c^2-2\,a^3b^2cd+a^4bd^2+\left(b^5c^2-2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*(2*A*b^2*c^2 - 4*A*a*b*c*d + 2*A*a^2*d^2 - 2*(B*b^2*c*d - B*a*b*d^2)*n
*x + (B*b^2*c^2 - 4*B*a*b*c*d + 3*B*a^2*d^2)*n - 2*(B*b^2*d^2*n*x^2 + 2*B*a
*b*d^2*n*x - (B*b^2*c^2 - 2*B*a*b*c*d)*n)*log(b*x + a) + 2*(B*b^2*d^2*n*x^2
 + 2*B*a*b*d^2*n*x - (B*b^2*c^2 - 2*B*a*b*c*d)*n)*log(d*x + c) + 2*(B*b^2*c
^2 - 2*B*a*b*c*d + B*a^2*d^2)*log(e))/(a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*
d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*
c*d + a^3*b^2*d^2)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.27317, size = 323, normalized size = 2.36

$$\frac{Bd^2n\log(bx+a)}{2\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)}-\frac{Bd^2n\log(dx+c)}{2\left(b^3c^2-2\,ab^2cd+a^2bd^2\right)}-\frac{Bn\log(bx+a)}{2\left(b^3x^2+2\,ab^2x+a^2b\right)}+\frac{Bn\log(dx+c)}{2\left(b^3x^2+2\,ab^2x+a^2b\right)}+\frac{2\,Bbdn\cdots}{4\left(b^4c\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3,x, algorithm="giac")
```

```
[Out] 1/2*B*d^2*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 1/2*B*d^2*n*
log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 1/2*B*n*log(b*x + a)/(b^
3*x^2 + 2*a*b^2*x + a^2*b) + 1/2*B*n*log(d*x + c)/(b^3*x^2 + 2*a*b^2*x + a^
2*b) + 1/4*(2*B*b*d*n*x - B*b*c*n + 3*B*a*d*n - 2*A*b*c - 2*B*b*c + 2*A*a*d
 + 2*B*a*d)/(b^4*c*x^2 - a*b^3*d*x^2 + 2*a*b^3*c*x - 2*a^2*b^2*d*x + a^2*b^
2*c - a^3*b*d)
```

3.154 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4}\,dx$

Optimal. Leaf size=166

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{3b(a+bx)^3}-\frac{Bd^2n}{3b(a+bx)(bc-ad)^2}-\frac{Bd^3n\log(a+bx)}{3b(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3b(bc-ad)^3}+\frac{Bdn}{6b(a+bx)^2(bc-ad}$$

```
[Out] -(B*n)/(9*b*(a + b*x)^3) + (B*d*n)/(6*b*(b*c - a*d)*(a + b*x)^2) - (B*d^2*n
)/(3*b*(b*c - a*d)^2*(a + b*x)) - (B*d^3*n*Log[a + b*x])/(3*b*(b*c - a*d)^3
) + (B*d^3*n*Log[c + d*x])/(3*b*(b*c - a*d)^3) - (A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])/(3*b*(a + b*x)^3)
```

Rubi [A] time = 0.169881, antiderivative size = 178, normalized size of antiderivative = 1.07, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 44}

$$-\frac{A}{3b(a+bx)^3}-\frac{Bd^2n}{3b(a+bx)(bc-ad)^2}-\frac{Bd^3n\log(a+bx)}{3b(bc-ad)^3}+\frac{Bd^3n\log(c+dx)}{3b(bc-ad)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3}+\frac{B}{6b(a+bx}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^4,x]
```

```
[Out] -A/(3*b*(a + b*x)^3) - (B*n)/(9*b*(a + b*x)^3) + (B*d*n)/(6*b*(b*c - a*d)*(
a + b*x)^2) - (B*d^2*n)/(3*b*(b*c - a*d)^2*(a + b*x)) - (B*d^3*n*Log[a + b*
x])/(3*b*(b*c - a*d)^3) + (B*d^3*n*Log[c + d*x])/(3*b*(b*c - a*d)^3) - (B*L
og[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(a + b*x)^3)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
```

```
0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\,dx = \int \left(\frac{A}{(a+bx)^4} + \frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\right) dx$$

$$= -\frac{A}{3b(a+bx)^3} + B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}\,dx$$

$$= -\frac{A}{3b(a+bx)^3} - \frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3} + \frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^4(c+dx)}\,dx}{3b}$$

$$= -\frac{A}{3b(a+bx)^3} - \frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b(a+bx)^3} + \frac{(B(bc-ad)n)\int \left(\frac{b}{(bc-ad)(a+bx)^4}\right.}{}$$

$$= -\frac{A}{3b(a+bx)^3} - \frac{Bn}{9b(a+bx)^3} + \frac{Bdn}{6b(bc-ad)(a+bx)^2} - \frac{Bd^2n}{3b(bc-ad)^2(a+bx)} -$$

Mathematica [A] time = 0.400264, size = 143, normalized size = 0.86

$$-\frac{\frac{6A}{(a+bx)^3} + Bn\left(\frac{\frac{6d^2(a+bx)^2}{(bc-ad)^2} + \frac{3d(a+bx)}{ad-bc} + 2}{(a+bx)^3} + \frac{6d^3\log(a+bx)}{(bc-ad)^3} - \frac{6d^3\log(c+dx)}{(bc-ad)^3}\right) + \frac{6B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^3}}{18b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^4,x]
```

```
[Out] -((6*A)/(a + b*x)^3 + B*n*((2 + (3*d*(a + b*x))/(-(b*c) + a*d) + (6*d^2*(a
+ b*x)^2)/(b*c - a*d)^2)/(a + b*x)^3 + (6*d^3*Log[a + b*x])/(b*c - a*d)^3 -
 (6*d^3*Log[c + d*x])/(b*c - a*d)^3) + (6*B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])/(a + b*x)^3)/(18*b)
```

Maple [C] time = 0.475, size = 1976, normalized size = 11.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x)
```

```
[Out] 1/3*B/b/(b*x+a)^3*ln((d*x+c)^n)-1/18*(-6*B*a^3*d^3*ln((b*x+a)^n)+6*B*b^3*c^
3*ln((b*x+a)^n)+18*A*a^2*b*c*d^2-18*A*a*b^2*c^2*d-11*B*a^3*d^3*n-6*B*ln(d*x
+c)*a^3*d^3*n+6*B*a^3*n*ln(-b*x-a)*d^3+6*A*b^3*c^3-6*A*a^3*d^3+18*B*ln(e)*a
^2*b*c*d^2-18*B*ln(e)*a*b^2*c^2*d-6*B*ln(e)*a^3*d^3+6*B*ln(e)*b^3*c^3-6*B*l
n(d*x+c)*b^3*d^3*n*x^3+6*B*ln(-b*x-a)*b^3*d^3*n*x^3+9*I*B*Pi*a^2*b*c*d^2*cs
gn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-9*I*B*Pi*a*b^
2*c^2*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-9*I*B*Pi*a*b^2*c^2*d*cs
gn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-9*I*B*Pi*a*b^2*c^2*d*csgn(I
/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-9*I*B*Pi*a*b^2*c^2*d*csgn(I*(
b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+2*B*b^3*c^3*n-9*B*a
*c^2*d*n*b^2+18*B*a*b^2*c*d^2*n*x-9*I*B*Pi*a^2*b*c*d^2*csgn(I*(b*x+a)^n/((d
*x+c)^n))^3-9*I*B*Pi*a^2*b*c*d^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+9*I*B*Pi
*a*b^2*c^2*d*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+9*I*B*Pi*a*b^2*c^2*d*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)^3+3*I*B*Pi*a^3*d^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+
c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+3*I*B*Pi*a^3*d^3*csgn(I*(b*x+a)^n)*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-3*I*B*Pi*b^3*c^3*csgn(I*e)
*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-3*I*B*Pi*b^3
*c^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+9*
I*B*Pi*a^2*b*c*d^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+9*I*B*Pi*a^2
*b*c*d^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+9*I*B*Pi*a^2*b*c
*d^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-18*B*ln(d*x+c)*a*b
^2*d^3*n*x^2+18*B*ln(-b*x-a)*a*b^2*d^3*n*x^2-18*B*ln(d*x+c)*a^2*b*d^3*n*x+1
8*B*ln(-b*x-a)*a^2*b*d^3*n*x-3*I*B*Pi*b^3*c^3*csgn(I*(b*x+a)^n/((d*x+c)^n))
^3-3*I*B*Pi*b^3*c^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+3*I*B*Pi*b^3*c^3*csgn
(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-15*B*a^2*b*d^3*
n*x-3*B*b^3*c^2*d*n*x-3*I*B*Pi*a^3*d^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+
a)^n)^2+18*B*a^2*b*c*d^2*n+18*B*a^2*b*c*d^2*ln((b*x+a)^n)-18*B*a*b^2*c^2*d*
ln((b*x+a)^n)-6*B*a*b^2*d^3*n*x^2+6*B*b^3*c*d^2*n*x^2-9*I*B*Pi*a^2*b*c*d^2*
csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-9*I
*B*Pi*a^2*b*c*d^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((
d*x+c)^n))+3*I*B*Pi*a^3*d^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+3*I*B*Pi*a^3*d^
3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-3*I*B*Pi*a^3*d^3*csgn(I*(b*x+a)^n)*csgn
(I*(b*x+a)^n/((d*x+c)^n))^2-3*I*B*Pi*a^3*d^3*csgn(I/((d*x+c)^n))*csgn(I*(b*
x+a)^n/((d*x+c)^n))^2-3*I*B*Pi*a^3*d^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)^2+3*I*B*Pi*b^3*c^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)
*(b*x+a)^n)^2+3*I*B*Pi*b^3*c^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^
```

```
n))^2+3*I*B*Pi*b^3*c^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+
9*I*B*Pi*a*b^2*c^2*d*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)+9*I*B*Pi*a*b^2*c^2*d*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n)
)*csgn(I*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^3/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(-a*
d+b*c)/b
```

Maxima [B] time = 1.25239, size = 540, normalized size = 3.25

$$-\frac{\left(\frac{6\,d^3en\log(bx+a)}{b^4c^3-3\,ab^3c^2d+3\,a^2b^2cd^2-a^3bd^3}-\frac{6\,d^3en\log(dx+c)}{b^4c^3-3\,ab^3c^2d+3\,a^2b^2cd^2-a^3bd^3}+\frac{6\,b^2d^2enx^2+2\,b^2c^2en-7\,abcden+11\,a^2d^2en-3\left(b^2cden-5\,ab\right.}{a^3b^3c^2-2\,a^4b^2cd+a^5bd^2+\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)x^3+3\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)x^2}\right.}{18\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x, algorithm="maxima
")
```

```
[Out] -1/18*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*n + 11*
a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^4*b^2*c
*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^5*c^2 -
 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^
2*d^2)*x))*B/e - 1/3*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^4*x^3 + 3*a*b^3*x^
2 + 3*a^2*b^2*x + a^3*b) - 1/3*A/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3
*b)
```

Fricas [B] time = 1.13249, size = 1123, normalized size = 6.77

$$-\frac{6\,Ab^3c^3-18\,Aab^2c^2d+18\,Aa^2bcd^2-6\,Aa^3d^3+6\left(Bb^3cd^2-Bab^2d^3\right)nx^2-3\left(Bb^3c^2d-6\,Bab^2cd^2+5\,Ba^2bd^3\right)nx+\left(2\right.}{18\left(a^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x, algorithm="fricas
")
```

```
[Out] -1/18*(6*A*b^3*c^3 - 18*A*a*b^2*c^2*d + 18*A*a^2*b*c*d^2 - 6*A*a^3*d^3 + 6*
(B*b^3*c*d^2 - B*a*b^2*d^3)*n*x^2 - 3*(B*b^3*c^2*d - 6*B*a*b^2*c*d^2 + 5*B*
```

```
a^2*b*d^3)*n*x + (2*B*b^3*c^3 - 9*B*a*b^2*c^2*d + 18*B*a^2*b*c*d^2 - 11*B*a
^3*d^3)*n + 6*(B*b^3*d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x +
(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log(b*x + a) - 6*(B*b^3*
d^3*n*x^3 + 3*B*a*b^2*d^3*n*x^2 + 3*B*a^2*b*d^3*n*x + (B*b^3*c^3 - 3*B*a*b^
2*c^2*d + 3*B*a^2*b*c*d^2)*n)*log(d*x + c) + 6*(B*b^3*c^3 - 3*B*a*b^2*c^2*d
 + 3*B*a^2*b*c*d^2 - B*a^3*d^3)*log(e))/(a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*
a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3
*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^
3)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.29256, size = 605, normalized size = 3.64

$$-\frac{Bd^3n\log(bx+a)}{3\left(b^4c^3-3\,ab^3c^2d+3\,a^2b^2cd^2-a^3bd^3\right)}+\frac{Bd^3n\log(dx+c)}{3\left(b^4c^3-3\,ab^3c^2d+3\,a^2b^2cd^2-a^3bd^3\right)}-\frac{Bn\log(bx+a)}{3\left(b^4x^3+3\,ab^3x^2+3\,a^2b^2x+a^3b\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^4,x, algorithm="giac")
```

```
[Out] -1/3*B*d^3*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*
b*d^3) + 1/3*B*d^3*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^
2 - a^3*b*d^3) - 1/3*B*n*log(b*x + a)/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x
+ a^3*b) + 1/3*B*n*log(d*x + c)/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*
b) - 1/18*(6*B*b^2*d^2*n*x^2 - 3*B*b^2*c*d*n*x + 15*B*a*b*d^2*n*x + 2*B*b^2
*c^2*n - 7*B*a*b*c*d*n + 11*B*a^2*d^2*n + 6*A*b^2*c^2 + 6*B*b^2*c^2 - 12*A*
a*b*c*d - 12*B*a*b*c*d + 6*A*a^2*d^2 + 6*B*a^2*d^2)/(b^6*c^2*x^3 - 2*a*b^5*
c*d*x^3 + a^2*b^4*d^2*x^3 + 3*a*b^5*c^2*x^2 - 6*a^2*b^4*c*d*x^2 + 3*a^3*b^3
*d^2*x^2 + 3*a^2*b^4*c^2*x - 6*a^3*b^3*c*d*x + 3*a^4*b^2*d^2*x + a^3*b^3*c^
2 - 2*a^4*b^2*c*d + a^5*b*d^2)
```

3.155 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^5} dx$

Optimal. Leaf size=195

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{4b(a+bx)^4}+\frac{Bd^3n}{4b(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8b(a+bx)^2(bc-ad)^2}+\frac{Bd^4n\log(a+bx)}{4b(bc-ad)^4}-\frac{Bd^4n\log(c+}{4b(bc-ad)}$$

```
[Out] -(B*n)/(16*b*(a + b*x)^4) + (B*d*n)/(12*b*(b*c - a*d)*(a + b*x)^3) - (B*d^2
*n)/(8*b*(b*c - a*d)^2*(a + b*x)^2) + (B*d^3*n)/(4*b*(b*c - a*d)^3*(a + b*x
)) + (B*d^4*n*Log[a + b*x])/(4*b*(b*c - a*d)^4) - (B*d^4*n*Log[c + d*x])/(4
*b*(b*c - a*d)^4) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*(a + b*x)
^4)
```

Rubi [A] time = 0.192558, antiderivative size = 207, normalized size of antiderivative = 1.06, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 44}

$$-\frac{A}{4b(a+bx)^4}+\frac{Bd^3n}{4b(a+bx)(bc-ad)^3}-\frac{Bd^2n}{8b(a+bx)^2(bc-ad)^2}+\frac{Bd^4n\log(a+bx)}{4b(bc-ad)^4}-\frac{Bd^4n\log(c+dx)}{4b(bc-ad)^4}-\frac{B\log(e(a+bx}{4b(a+}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^5,x]
```

```
[Out] -A/(4*b*(a + b*x)^4) - (B*n)/(16*b*(a + b*x)^4) + (B*d*n)/(12*b*(b*c - a*d)
*(a + b*x)^3) - (B*d^2*n)/(8*b*(b*c - a*d)^2*(a + b*x)^2) + (B*d^3*n)/(4*b*
(b*c - a*d)^3*(a + b*x)) + (B*d^4*n*Log[a + b*x])/(4*b*(b*c - a*d)^4) - (B*
d^4*n*Log[c + d*x])/(4*b*(b*c - a*d)^4) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/(4*b*(a + b*x)^4)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
```

```
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\,dx = \int \left(\frac{A}{(a+bx)^5}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\right)dx$$
$$= -\frac{A}{4b(a+bx)^4}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^5}\,dx$$
$$= -\frac{A}{4b(a+bx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b(a+bx)^4}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)^5(c+dx)}\,dx}{4b}$$
$$= -\frac{A}{4b(a+bx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b(a+bx)^4}+\frac{(B(bc-ad)n)\int \left(\frac{b}{(bc-ad)(a+bx)^5}-\right.}{}$$
$$= -\frac{A}{4b(a+bx)^4}-\frac{Bn}{16b(a+bx)^4}+\frac{Bdn}{12b(bc-ad)(a+bx)^3}-\frac{Bd^2n}{8b(bc-ad)^2(a+bx)^2}$$

Mathematica [A] time = 0.395787, size = 165, normalized size = 0.85

$$-\frac{\frac{12A}{(a+bx)^4}+Bn\left(\frac{-\frac{12d^3(a+bx)^3}{(bc-ad)^3}+\frac{6d^2(a+bx)^2}{(bc-ad)^2}+\frac{4d(a+bx)}{ad-bc}+3}{(a+bx)^4}-\frac{12d^4\log(a+bx)}{(bc-ad)^4}+\frac{12d^4\log(c+dx)}{(bc-ad)^4}\right)+\frac{12B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)^4}}{48b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^5,x]
```

```
[Out] -((12*A)/(a + b*x)^4 + B*n*((3 + (4*d*(a + b*x))/(-(b*c) + a*d) + (6*d^2*(a
 + b*x)^2)/(b*c - a*d)^2 - (12*d^3*(a + b*x)^3)/(b*c - a*d)^3)/(a + b*x)^4
- (12*d^4*Log[a + b*x])/(b*c - a*d)^4 + (12*d^4*Log[c + d*x])/(b*c - a*d)^4
) + (12*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(a + b*x)^4)/(48*b)
```

Maple [C] time = 0.509, size = 2583, normalized size = 13.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x)
```

```
[Out] 1/4*B/b/(b*x+a)^4*ln((d*x+c)^n)+1/48*(24*I*B*Pi*a^3*b*c*d^3*csgn(I*(b*x+a)^
n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+24*I*B*Pi*a^3*b*c*d^3*csgn(I/((d*x+c)^n)
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-12*B*ln(d*x+c)*a^4*d^4*n+12*B*a^4*n*ln(-b
*x-a)*d^4-12*B*a^4*d^4*ln((b*x+a)^n)-12*B*b^4*c^4*ln((b*x+a)^n)-3*B*b^4*c^4
*n-12*A*a^4*d^4-25*B*a^4*d^4*n-12*B*ln(e)*a^4*d^4-12*B*ln(e)*b^4*c^4-12*A*b
^4*c^4-6*I*B*Pi*b^4*c^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-6*I*B*P
i*b^4*c^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-6*I*B*Pi*b^4*c^
4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+48*B*ln(e)*a^3*b*c*d^
3-72*B*ln(e)*a^2*b^2*c^2*d^2+48*B*ln(e)*a*b^3*c^3*d+36*I*B*Pi*a^2*b^2*c^2*d
^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-24*I
*B*Pi*a*b^3*c^3*d*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)
^n)*(b*x+a)^n)-24*I*B*Pi*a*b^3*c^3*d*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))-24*I*B*Pi*a*b^3*c^3*d*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)^3+48*A*a^3*b*c*d^3-72*A*a^2*b^2*c^2*d^2+48*A*a*b^3*c^3*d-6*I*B*Pi*
b^4*c^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+48*
B*a^3*b*c*d^3*n-36*B*a^2*b^2*c^2*d^2*n+16*B*a*b^3*c^3*d*n-12*B*a*b^3*d^4*n*
x^3+12*B*b^4*c*d^3*n*x^3-24*I*B*Pi*a^3*b*c*d^3*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^3+36*I*B*Pi*a^2*b^2*c^2*d^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+36*I*B*Pi*a
^2*b^2*c^2*d^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-24*I*B*Pi*a*b^3*c^3*d*csgn
(I*(b*x+a)^n/((d*x+c)^n))^3+6*I*B*Pi*a^4*d^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d
*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+6*I*B*Pi*a^4*d^4*csgn(I*(b*x+a)^n
)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-24*I*B*Pi*a^3*b*c*d^3*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^3-24*I*B*Pi*a^3*b*c*d^3*csgn(I*(b*x+a)^n)*csgn
(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+36*I*B*Pi*a^2*b^2*c^2*d^2*csg
n(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-6*I*B*
Pi*a^4*d^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-24*I*B*Pi*a^3*b*c*d^
3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+4
8*B*a*b^3*c*d^3*n*x^2+72*B*a^2*b^2*c*d^3*n*x-24*B*a*b^3*c^2*d^2*n*x+24*I*B*
Pi*a^3*b*c*d^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^2-36*I*B*Pi*a^2*b^2*c^2*d^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-3
6*I*B*Pi*a^2*b^2*c^2*d^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+
24*I*B*Pi*a*b^3*c^3*d*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)^2+24*I*B*Pi*a^3*b*c*d^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^
2-36*I*B*Pi*a^2*b^2*c^2*d^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n
))^2-36*I*B*Pi*a^2*b^2*c^2*d^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x
```

+c)^n)*(b*x+a)^n)^2-48*B*ln(d*x+c)*a*b^3*d^4*n*x^3+48*B*ln(-b*x-a)*a*b^3*d^
4*n*x^3-72*B*ln(d*x+c)*a^2*b^2*d^4*n*x^2+72*B*ln(-b*x-a)*a^2*b^2*d^4*n*x^2-
48*B*ln(d*x+c)*a^3*b*d^4*n*x+48*B*ln(-b*x-a)*a^3*b*d^4*n*x-12*B*ln(d*x+c)*b
^4*d^4*n*x^4+12*B*ln(-b*x-a)*b^4*d^4*n*x^4+6*I*B*Pi*a^4*d^4*csgn(I*(b*x+a)^
n/((d*x+c)^n))^3+6*I*B*Pi*a^4*d^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+6*I*B*P
i*b^4*c^4*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+6*I*B*Pi*b^4*c^4*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^3-6*I*B*Pi*a^4*d^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x
+c)^n))^2-6*I*B*Pi*a^4*d^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^2-6*I*B*Pi*a^4*d^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^2+6*I*B*Pi*b^4*c^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)+6*I*B*Pi*b^4*c^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^
n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+48*B*a^3*b*c*d^3*ln((b*x+a)^n)-72*B*a^2*b
^2*c^2*d^2*ln((b*x+a)^n)+48*B*a*b^3*c^3*d*ln((b*x+a)^n)+24*I*B*Pi*a*b^3*c^3
*d*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+24*I*B*Pi*a*b^3*c^3*d*csgn(I
*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+24*I*B*Pi*a*b^3*c^3*d*csgn(I/((
d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-42*B*a^2*b^2*d^4*n*x^2-6*B*b^4*c
^2*d^2*n*x^2-52*B*a^3*b*d^4*n*x+4*B*b^4*c^3*d*n*x)/(b*x+a)^4/(-a^3*d^3+3*a^
2*b*c*d^2-3*a*b^2*c^2*d+b^3*c^3)/(-a*d+b*c)/b

Maxima [B] time = 1.7803, size = 834, normalized size = 4.28

$$\frac{\left(\frac{12\,d^4en\log(bx+a)}{b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4}-\frac{12\,d^4en\log(dx+c)}{b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4}+\frac{12\,b^3d^3enx^3-3\,b^3c^3en\cdots}{a^4b^4c^3-3\,a^5b^3c^2d+3\,a^6b^2cd^2-a^7bd^3+\left(b^8c^3-3\,ab^7c^2d+3\,a^2b^6c\cdots\right.}\cdots\right.}{48\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x, algorithm="maxima
")

[Out] 1/48*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2
- 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4
*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n
*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3
*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2
*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^
2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*
x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2
 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*B/
e - 1/4*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3
*x^2 + 4*a^3*b^2*x + a^4*b) - 1/4*A/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2

```
+ 4*a^3*b^2*x + a^4*b)
```

Fricas [B] time = 1.1799, size = 1697, normalized size = 8.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x, algorithm="fricas
")

[Out] -1/48*(12*A*b^4*c^4 - 48*A*a*b^3*c^3*d + 72*A*a^2*b^2*c^2*d^2 - 48*A*a^3*b*
c*d^3 + 12*A*a^4*d^4 - 12*(B*b^4*c*d^3 - B*a*b^3*d^4)*n*x^3 + 6*(B*b^4*c^2*
d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4)*n*x^2 - 4*(B*b^4*c^3*d - 6*B*a*b^3
*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*b*d^4)*n*x + (3*B*b^4*c^4 - 16*B*a
*b^3*c^3*d + 36*B*a^2*b^2*c^2*d^2 - 48*B*a^3*b*c*d^3 + 25*B*a^4*d^4)*n - 12
*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2*b^2*d^4*n*x^2 + 4*B*a^3*b
*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c
*d^3)*n)*log(b*x + a) + 12*(B*b^4*d^4*n*x^4 + 4*B*a*b^3*d^4*n*x^3 + 6*B*a^2
*b^2*d^4*n*x^2 + 4*B*a^3*b*d^4*n*x - (B*b^4*c^4 - 4*B*a*b^3*c^3*d + 6*B*a^2
*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*n)*log(d*x + c) + 12*(B*b^4*c^4 - 4*B*a*b^3
*c^3*d + 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3 + B*a^4*d^4)*log(e))/(a^4*b^
5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 +
 (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d
^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*
d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d
^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d
+ 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(b*x+a)**5,x)

[Out] Timed out
```

Giac [B] time = 1.37101, size = 959, normalized size = 4.92

$$\frac{Bd^4n\log(bx+a)}{4\left(b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4\right)}-\frac{Bd^4n\log(dx+c)}{4\left(b^5c^4-4\,ab^4c^3d+6\,a^2b^3c^2d^2-4\,a^3b^2cd^3+a^4bd^4\right)}-\frac{}{4\left(b^5x^4+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(b*x+a)^5,x, algorithm="giac")
```

```
[Out] 1/4*B*d^4*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a
^3*b^2*c*d^3 + a^4*b*d^4) - 1/4*B*d^4*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3
*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 1/4*B*n*log(b*x + a
)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) + 1/4*B*n*l
og(d*x + c)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) +
 1/48*(12*B*b^3*d^3*n*x^3 - 6*B*b^3*c*d^2*n*x^2 + 42*B*a*b^2*d^3*n*x^2 + 4*
B*b^3*c^2*d*n*x - 20*B*a*b^2*c*d^2*n*x + 52*B*a^2*b*d^3*n*x - 3*B*b^3*c^3*n
 + 13*B*a*b^2*c^2*d*n - 23*B*a^2*b*c*d^2*n + 25*B*a^3*d^3*n - 12*A*b^3*c^3
- 12*B*b^3*c^3 + 36*A*a*b^2*c^2*d + 36*B*a*b^2*c^2*d - 36*A*a^2*b*c*d^2 - 3
6*B*a^2*b*c*d^2 + 12*A*a^3*d^3 + 12*B*a^3*d^3)/(b^8*c^3*x^4 - 3*a*b^7*c^2*d
*x^4 + 3*a^2*b^6*c*d^2*x^4 - a^3*b^5*d^3*x^4 + 4*a*b^7*c^3*x^3 - 12*a^2*b^6
*c^2*d*x^3 + 12*a^3*b^5*c*d^2*x^3 - 4*a^4*b^4*d^3*x^3 + 6*a^2*b^6*c^3*x^2 -
 18*a^3*b^5*c^2*d*x^2 + 18*a^4*b^4*c*d^2*x^2 - 6*a^5*b^3*d^3*x^2 + 4*a^3*b^
5*c^3*x - 12*a^4*b^4*c^2*d*x + 12*a^5*b^3*c*d^2*x - 4*a^6*b^2*d^3*x + a^4*b
^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
```

3.156 $\int (a+bx)^3 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 dx$

Optimal. Leaf size=322

$$-\frac{B^2n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{2bd^4}-\frac{Bn(bc-ad)^4\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(6B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+6A+11Bn\right)}{12bd^4}-\frac{Bn(a$$

```
[Out] -(B*(b*c - a*d)*n*(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(6*
b*d) + ((a + b*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(4*b) + (B*
(b*c - a*d)^2*n*(a + b*x)^2*(3*A + B*n + 3*B*Log[(e*(a + b*x)^n)/(c + d*x)^
n]))/(12*b*d^2) - (B*(b*c - a*d)^3*n*(a + b*x)*(6*A + 5*B*n + 6*B*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]))/(12*b*d^3) - (B*(b*c - a*d)^4*n*Log[(b*c - a*d)/(
b*(c + d*x))]*(6*A + 11*B*n + 6*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(12*b*
d^4) - (B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b
*d^4)
```

Rubi [A] time = 0.771862, antiderivative size = 542, normalized size of antiderivative = 1.68, number of steps used = 21, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{B^2n^2(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{2bd^4}+\frac{A^2(a+bx)^4}{4b}-\frac{ABnx(bc-ad)^3}{2d^3}+\frac{ABn(a+bx)^2(bc-ad)^2}{4bd^2}+\frac{ABn(bc-ad)^4\log}{2bd^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] -(A*B*(b*c - a*d)^3*n*x)/(2*d^3) - (5*B^2*(b*c - a*d)^3*n^2*x)/(12*d^3) + (
A*B*(b*c - a*d)^2*n*(a + b*x)^2)/(4*b*d^2) + (B^2*(b*c - a*d)^2*n^2*(a + b*
x)^2)/(12*b*d^2) - (A*B*(b*c - a*d)*n*(a + b*x)^3)/(6*b*d) + (A^2*(a + b*x)
^4)/(4*b) + (A*B*(b*c - a*d)^4*n*Log[c + d*x])/(2*b*d^4) + (11*B^2*(b*c - a
*d)^4*n^2*Log[c + d*x])/(12*b*d^4) - (B^2*(b*c - a*d)^3*n*(a + b*x)*Log[(e*
(a + b*x)^n)/(c + d*x)^n])/(2*b*d^3) + (B^2*(b*c - a*d)^2*n*(a + b*x)^2*Log
[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*d^2) - (B^2*(b*c - a*d)*n*(a + b*x)^3*L
og[(e*(a + b*x)^n)/(c + d*x)^n])/(6*b*d) + (A*B*(a + b*x)^4*Log[(e*(a + b*x
)^n)/(c + d*x)^n])/(2*b) - (B^2*(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x
))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*d^4) + (B^2*(a + b*x)^4*Log[(e*(
a + b*x)^n)/(c + d*x)^n]^2)/(4*b) - (B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a
 + b*x))/(b*(c + d*x))])/(2*b*d^4)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
```

```
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (a+bx)^3 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 dx = \int \left(A^2(a+bx)^3 + 2AB(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right) + B^2(a+$$

$$= \frac{A^2(a+bx)^4}{4b} + (2AB)\int (a+bx)^3 \log\left(e(a+bx)^n(c+dx)^{-n}\right) dx + B^2$$

$$= \frac{A^2(a+bx)^4}{4b} + \frac{AB(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} + \frac{B^2(a+bx)}{}$$

$$= \frac{A^2(a+bx)^4}{4b} + \frac{AB(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b} + \frac{B^2(a+bx)}{}$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} - \frac{AB(bc-ad)n(a+b}{6bd}$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} - \frac{AB(bc-ad)n(a+b}{6bd}$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} - \frac{AB(bc-ad)n(a+b}{6bd}$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} - \frac{5B^2(bc-ad)^3n^2x}{12d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} +$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} - \frac{5B^2(bc-ad)^3n^2x}{12d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} +$$

$$= -\frac{AB(bc-ad)^3nx}{2d^3} - \frac{5B^2(bc-ad)^3n^2x}{12d^3} + \frac{AB(bc-ad)^2n(a+bx)^2}{4bd^2} +$$

Mathematica [B] time = 1.551, size = 1709, normalized size = 5.31

$$\frac{3A^2d^4x^4b^4 - 2ABcd^3nx^3b^4 + B^2c^2d^2n^2x^2b^4 + 3ABc^2d^2nx^2b^4 + 3B^2c^4n^2\log^2(c+dx)b^4 + 3B^2d^4x^4\log^2\left(e(a+bx)^n(c+dx\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-24*a^4*A*B*d^4*n + 6*a*b^3*B^2*c^3*d*n^2 - 24*a^2*b^2*B^2*c^2*d^2*n^2 + 3
6*a^3*b*B^2*c*d^3*n^2 - 24*a^4*B^2*d^4*n^2 + 12*a^3*A^2*b*d^4*x - 6*A*b^4*B
*c^3*d*n*x + 24*a*A*b^3*B*c^2*d^2*n*x - 36*a^2*A*b^2*B*c*d^3*n*x + 18*a^3*A
```

```
*b*B*d^4*n*x - 5*b^4*B^2*c^3*d*n^2*x + 17*a*b^3*B^2*c^2*d^2*n^2*x - 19*a^2*
b^2*B^2*c*d^3*n^2*x + 7*a^3*b*B^2*d^4*n^2*x + 18*a^2*A^2*b^2*d^4*x^2 + 3*A*
b^4*B*c^2*d^2*n*x^2 - 12*a*A*b^3*B*c*d^3*n*x^2 + 9*a^2*A*b^2*B*d^4*n*x^2 +
b^4*B^2*c^2*d^2*n^2*x^2 - 2*a*b^3*B^2*c*d^3*n^2*x^2 + a^2*b^2*B^2*d^4*n^2*x
^2 + 12*a*A^2*b^3*d^4*x^3 - 2*A*b^4*B*c*d^3*n*x^3 + 2*a*A*b^3*B*d^4*n*x^3 +
 3*A^2*b^4*d^4*x^4 - 3*a^4*B^2*d^4*n^2*Log[a + b*x]^2 + 6*A*b^4*B*c^4*n*Log
[c + d*x] - 24*a*A*b^3*B*c^3*d*n*Log[c + d*x] + 36*a^2*A*b^2*B*c^2*d^2*n*Lo
g[c + d*x] - 24*a^3*A*b*B*c*d^3*n*Log[c + d*x] + 11*b^4*B^2*c^4*n^2*Log[c +
 d*x] - 38*a*b^3*B^2*c^3*d*n^2*Log[c + d*x] + 45*a^2*b^2*B^2*c^2*d^2*n^2*Lo
g[c + d*x] - 18*a^3*b*B^2*c*d^3*n^2*Log[c + d*x] - 24*a^4*B^2*d^4*n^2*Log[c
 + d*x] + 3*b^4*B^2*c^4*n^2*Log[c + d*x]^2 - 12*a*b^3*B^2*c^3*d*n^2*Log[c +
 d*x]^2 + 18*a^2*b^2*B^2*c^2*d^2*n^2*Log[c + d*x]^2 - 12*a^3*b*B^2*c*d^3*n^
2*Log[c + d*x]^2 - 24*a^4*B^2*d^4*n*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 24*a
^3*A*b*B*d^4*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 6*b^4*B^2*c^3*d*n*x*Log[(
e*(a + b*x)^n)/(c + d*x)^n] + 24*a*b^3*B^2*c^2*d^2*n*x*Log[(e*(a + b*x)^n)/
(c + d*x)^n] - 36*a^2*b^2*B^2*c*d^3*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] +
18*a^3*b*B^2*d^4*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 36*a^2*A*b^2*B*d^4*
x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 3*b^4*B^2*c^2*d^2*n*x^2*Log[(e*(a +
b*x)^n)/(c + d*x)^n] - 12*a*b^3*B^2*c*d^3*n*x^2*Log[(e*(a + b*x)^n)/(c + d*
x)^n] + 9*a^2*b^2*B^2*d^4*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 24*a*A*b
^3*B*d^4*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b^4*B^2*c*d^3*n*x^3*Log[(
e*(a + b*x)^n)/(c + d*x)^n] + 2*a*b^3*B^2*d^4*n*x^3*Log[(e*(a + b*x)^n)/(c
+ d*x)^n] + 6*A*b^4*B*d^4*x^4*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 6*b^4*B^2*
c^4*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 24*a*b^3*B^2*c^3*d*n*
Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 36*a^2*b^2*B^2*c^2*d^2*n*Lo
g[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 24*a^3*b*B^2*c*d^3*n*Log[c +
d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 12*a^3*b*B^2*d^4*x*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^2 + 18*a^2*b^2*B^2*d^4*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n
]^2 + 12*a*b^3*B^2*d^4*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 3*b^4*B^2*d
^4*x^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + B*n*Log[a + b*x]*(-6*b*B*c*(b^3
*c^3 - 4*a*b^2*c^2*d + 6*a^2*b*c*d^2 - 4*a^3*d^3)*n*Log[c + d*x] + 6*B*(b*c
 - a*d)^4*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(-6*b^3*B*c^3*n + 21*a*b^2
*B*c^2*d*n - 26*a^2*b*B*c*d^2*n + a^3*d^3*(6*A + 35*B*n) + 6*a^3*B*d^3*Log[
(e*(a + b*x)^n)/(c + d*x)^n])) + 6*B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a +
 b*x))/(-(b*c) + a*d)])/(12*b*d^4)
```

Maple [C] time = 2.524, size = 26948, normalized size = 83.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 3.86044, size = 2526, normalized size = 7.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxi
ma")
```

```
[Out] 1/2*A*B*b^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A^2*b^3*x^4 + 2*A*B*a*
b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + A^2*a*b^2*x^3 + 3*A*B*a^2*b*x^2*lo
g((b*x + a)^n*e/(d*x + c)^n) + 3/2*A^2*a^2*b*x^2 + 2*A*B*a^3*x*log((b*x + a
)^n*e/(d*x + c)^n) + A^2*a^3*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*x +
c)/d)*A*B*a^3/e - 3*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 +
(b*c*e*n - a*d*e*n)*x/(b*d))*A*B*a^2*b/e + (2*a^3*e*n*log(b*x + a)/b^3 - 2*
c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*
n - a^2*d^2*e*n)*x)/(b^2*d^2))*A*B*a*b^2/e - 1/12*(6*a^4*e*n*log(b*x + a)/b
^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 -
3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b
^3*d^3))*A*B*b^3/e + 1/12*((11*n^2 + 6*n*log(e))*b^3*c^4 - 2*(19*n^2 + 12*n
*log(e))*a*b^2*c^3*d + 9*(5*n^2 + 4*n*log(e))*a^2*b*c^2*d^2 - 6*(3*n^2 + 4*
n*log(e))*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 1/2*(b^4*c^4*n^2 - 4*a*b^3*c^3*
d*n^2 + 6*a^2*b^2*c^2*d^2*n^2 - 4*a^3*b*c*d^3*n^2 + a^4*d^4*n^2)*(log(b*x +
 a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))
*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*x^4*log(e)^2 - 3*B^2*a^4*d^4*n^2*log(b*x
 + a)^2 - 2*(b^4*c*d^3*n*log(e) - (n*log(e) + 6*log(e)^2)*a*b^3*d^4)*B^2*x^
3 + ((n^2 + 3*n*log(e))*b^4*c^2*d^2 - 2*(n^2 + 6*n*log(e))*a*b^3*c*d^3 + (n
^2 + 9*n*log(e) + 18*log(e)^2)*a^2*b^2*d^4)*B^2*x^2 - 6*(b^4*c^4*n^2 - 4*a*
b^3*c^3*d*n^2 + 6*a^2*b^2*c^2*d^2*n^2 - 4*a^3*b*c*d^3*n^2)*B^2*log(b*x + a)
*log(d*x + c) + 3*(b^4*c^4*n^2 - 4*a*b^3*c^3*d*n^2 + 6*a^2*b^2*c^2*d^2*n^2
- 4*a^3*b*c*d^3*n^2)*B^2*log(d*x + c)^2 - ((5*n^2 + 6*n*log(e))*b^4*c^3*d -
 (17*n^2 + 24*n*log(e))*a*b^3*c^2*d^2 + (19*n^2 + 36*n*log(e))*a^2*b^2*c*d^
3 - (7*n^2 + 18*n*log(e) + 12*log(e)^2)*a^3*b*d^4)*B^2*x - (6*a*b^3*c^3*d*n
^2 - 21*a^2*b^2*c^2*d^2*n^2 + 26*a^3*b*c*d^3*n^2 - (11*n^2 + 6*n*log(e))*a^
4*d^4)*B^2*log(b*x + a) + 3*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*
a^2*b^2*d^4*x^2 + 4*B^2*a^3*b*d^4*x)*log((b*x + a)^n)^2 + 3*(B^2*b^4*d^4*x^
4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 + 4*B^2*a^3*b*d^4*x)*log((d
*x + c)^n)^2 + (6*B^2*b^4*d^4*x^4*log(e) + 6*B^2*a^4*d^4*n*log(b*x + a) + 2
*(a*b^3*d^4*(n + 12*log(e)) - b^4*c*d^3*n)*B^2*x^3 + 3*(3*a^2*b^2*d^4*(n +
```

```
4*log(e)) + b^4*c^2*d^2*n - 4*a*b^3*c*d^3*n)*B^2*x^2 + 6*(a^3*b*d^4*(3*n +
4*log(e)) - b^4*c^3*d*n + 4*a*b^3*c^2*d^2*n - 6*a^2*b^2*c*d^3*n)*B^2*x + 6*
(b^4*c^4*n - 4*a*b^3*c^3*d*n + 6*a^2*b^2*c^2*d^2*n - 4*a^3*b*c*d^3*n)*B^2*l
og(d*x + c))*log((b*x + a)^n) - (6*B^2*b^4*d^4*x^4*log(e) + 6*B^2*a^4*d^4*n
*log(b*x + a) + 2*(a*b^3*d^4*(n + 12*log(e)) - b^4*c*d^3*n)*B^2*x^3 + 3*(3*
a^2*b^2*d^4*(n + 4*log(e)) + b^4*c^2*d^2*n - 4*a*b^3*c*d^3*n)*B^2*x^2 + 6*(
a^3*b*d^4*(3*n + 4*log(e)) - b^4*c^3*d*n + 4*a*b^3*c^2*d^2*n - 6*a^2*b^2*c*
d^3*n)*B^2*x + 6*(b^4*c^4*n - 4*a*b^3*c^3*d*n + 6*a^2*b^2*c^2*d^2*n - 4*a^3
*b*c*d^3*n)*B^2*log(d*x + c) + 6*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6
*B^2*a^2*b^2*d^4*x^2 + 4*B^2*a^3*b*d^4*x)*log((b*x + a)^n))*log((d*x + c)^n
))/(b*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(A^2b^3x^3 + 3\,A^2ab^2x^2 + 3\,A^2a^2bx + A^2a^3 + \left(B^2b^3x^3 + 3\,B^2ab^2x^2 + 3\,B^2a^2bx + B^2a^3\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\left(A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b^3*x^3 + 3*A^2*a*b^2*x^2 + 3*A^2*a^2*b*x + A^2*a^3 + (B^2*b^3
*x^3 + 3*B^2*a*b^2*x^2 + 3*B^2*a^2*b*x + B^2*a^3)*log((b*x + a)^n*e/(d*x +
c)^n)^2 + 2*(A*B*b^3*x^3 + 3*A*B*a*b^2*x^2 + 3*A*B*a^2*b*x + A*B*a^3)*log((
b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^3 \left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^3*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

3.157 $\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 dx$

Optimal. Leaf size=263

$$\frac{2B^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}+\frac{Bn(bc-ad)^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(2B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2A+3Bn\right)}{3bd^3}+\frac{Bn(a+$$

```
[Out] -(B*(b*c - a*d)*n*(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(3*
b*d) + ((a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(3*b) + (B*
(b*c - a*d)^2*n*(a + b*x)*(2*A + B*n + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]
))/(3*b*d^2) + (B*(b*c - a*d)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*(2*A + 3*B
*n + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(3*b*d^3) + (2*B^2*(b*c - a*d)^
3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b*d^3)
```

Rubi [A] time = 0.625638, antiderivative size = 427, normalized size of antiderivative = 1.62, number of steps used = 18, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$\frac{2B^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}+\frac{A^2(a+bx)^3}{3b}+\frac{2ABnx(bc-ad)^2}{3d^2}-\frac{2ABn(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{2AB(a+bx)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)^2*n*x)/(3*d^2) + (B^2*(b*c - a*d)^2*n^2*x)/(3*d^2) - (A*
B*(b*c - a*d)*n*(a + b*x)^2)/(3*b*d) + (A^2*(a + b*x)^3)/(3*b) - (2*A*B*(b*
c - a*d)^3*n*Log[c + d*x])/(3*b*d^3) - (B^2*(b*c - a*d)^3*n^2*Log[c + d*x])
/(b*d^3) + (2*B^2*(b*c - a*d)^2*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n
])/(3*b*d^2) - (B^2*(b*c - a*d)*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(3*b*d) + (2*A*B*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b) +
 (2*B^2*(b*c - a*d)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/
(c + d*x)^n])/(3*b*d^3) + (B^2*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]
^2)/(3*b) + (2*B^2*(b*c - a*d)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(3*b*d^3)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
```

```
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2 \, dx = \int \left(A^2(a+bx)^2 + 2AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right) + B^2(a+$$

$$= \frac{A^2(a+bx)^3}{3b} + (2AB)\int (a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\, dx + B^2$$

$$= \frac{A^2(a+bx)^3}{3b} + \frac{2AB(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b} + \frac{B^2(a+bx}{}$$

$$= \frac{A^2(a+bx)^3}{3b} + \frac{2AB(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3b} + \frac{B^2(a+bx}{}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A^2(a+bx)^3}{3b} - \frac{2AB(b}{}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A^2(a+bx)^3}{3b} - \frac{2AB(b}{}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A^2(a+bx)^3}{3b} - \frac{2AB(b}{}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} + \frac{B^2(bc-ad)^2n^2x}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A}{}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} + \frac{B^2(bc-ad)^2n^2x}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A}{}$$

$$= \frac{2AB(bc-ad)^2nx}{3d^2} + \frac{B^2(bc-ad)^2n^2x}{3d^2} - \frac{AB(bc-ad)n(a+bx)^2}{3bd} + \frac{A}{}$$

Mathematica [B] time = 1.02683, size = 1149, normalized size = 4.37

$$\frac{A^2d^3x^3b^3 - ABcd^2nx^2b^3 - B^2c^3n^2\log^2(c+dx)b^3 + B^2d^3x^3\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)b^3 + B^2c^2dn^2xb^3 + 2ABc^2dnxb^3 -}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-6*a^3*A*B*d^3*n - 2*a*b^2*B^2*c^2*d*n^2 + 6*a^2*b*B^2*c*d^2*n^2 - 6*a^3*B
^2*d^3*n^2 + 3*a^2*A^2*b*d^3*x + 2*A*b^3*B*c^2*d*n*x - 6*a*A*b^2*B*c*d^2*n*
x + 4*a^2*A*b*B*d^3*n*x + b^3*B^2*c^2*d*n^2*x - 2*a*b^2*B^2*c*d^2*n^2*x + a
```

```
^2*b*B^2*d^3*n^2*x + 3*a*A^2*b^2*d^3*x^2 - A*b^3*B*c*d^2*n*x^2 + a*A*b^2*B*
d^3*n*x^2 + A^2*b^3*d^3*x^3 - a^3*B^2*d^3*n^2*Log[a + b*x]^2 - 2*A*b^3*B*c^
3*n*Log[c + d*x] + 6*a*A*b^2*B*c^2*d*n*Log[c + d*x] - 6*a^2*A*b*B*c*d^2*n*L
og[c + d*x] - 3*b^3*B^2*c^3*n^2*Log[c + d*x] + 7*a*b^2*B^2*c^2*d*n^2*Log[c
+ d*x] - 4*a^2*b*B^2*c*d^2*n^2*Log[c + d*x] - 6*a^3*B^2*d^3*n^2*Log[c + d*x
] - b^3*B^2*c^3*n^2*Log[c + d*x]^2 + 3*a*b^2*B^2*c^2*d*n^2*Log[c + d*x]^2 -
 3*a^2*b*B^2*c*d^2*n^2*Log[c + d*x]^2 - 6*a^3*B^2*d^3*n*Log[(e*(a + b*x)^n)
/(c + d*x)^n] + 6*a^2*A*b*B*d^3*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*b^3*
B^2*c^2*d*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 6*a*b^2*B^2*c*d^2*n*x*Log[
(e*(a + b*x)^n)/(c + d*x)^n] + 4*a^2*b*B^2*d^3*n*x*Log[(e*(a + b*x)^n)/(c +
 d*x)^n] + 6*a*A*b^2*B*d^3*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] - b^3*B^2*c
*d^2*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + a*b^2*B^2*d^3*n*x^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + 2*A*b^3*B*d^3*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n
] - 2*b^3*B^2*c^3*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 6*a*b^2
*B^2*c^2*d*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 6*a^2*b*B^2*c*
d^2*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 3*a^2*b*B^2*d^3*x*Log
[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 3*a*b^2*B^2*d^3*x^2*Log[(e*(a + b*x)^n)/(
c + d*x)^n]^2 + b^3*B^2*d^3*x^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + B*n*Lo
g[a + b*x]*(2*b*B*c*(b^2*c^2 - 3*a*b*c*d + 3*a^2*d^2)*n*Log[c + d*x] - 2*B*
(b*c - a*d)^3*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(2*b^2*B*c^2*n - 5*a*b
*B*c*d*n + a^2*d^2*(2*A + 9*B*n) + 2*a^2*B*d^2*Log[(e*(a + b*x)^n)/(c + d*x
)^n])) - 2*B^2*(b*c - a*d)^3*n^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])/
(3*b*d^3)
```

Maple [C] time = 2.135, size = 19969, normalized size = 75.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 3.73536, size = 1733, normalized size = 6.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxi
ma")
```

```
[Out] 2/3*A*B*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^2*b^2*x^3 + 2*A*B*a*
b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^2*a*b*x^2 + 2*A*B*a^2*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A^2*a^2*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*x
+ c)/d)*A*B*a^2/e - 2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2
+ (b*c*e*n - a*d*e*n)*x/(b*d))*A*B*a*b/e + 1/3*(2*a^3*e*n*log(b*x + a)/b^3
- 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^
2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A*B*b^2/e - 1/3*((3*n^2 + 2*n*log(e))*b^
2*c^3 - (7*n^2 + 6*n*log(e))*a*b*c^2*d + 2*(2*n^2 + 3*n*log(e))*a^2*c*d^2)*
B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2 + 3*a^2*b*c*d^2
*n^2 - a^3*d^3*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilo
g(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*x^3*log(e)^2
- B^2*a^3*d^3*n^2*log(b*x + a)^2 - (b^3*c*d^2*n*log(e) - (n*log(e) + 3*log(
e)^2)*a*b^2*d^3)*B^2*x^2 + 2*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2 + 3*a^2*b*c*d
^2*n^2)*B^2*log(b*x + a)*log(d*x + c) - (b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2 +
3*a^2*b*c*d^2*n^2)*B^2*log(d*x + c)^2 + ((n^2 + 2*n*log(e))*b^3*c^2*d - 2*(
n^2 + 3*n*log(e))*a*b^2*c*d^2 + (n^2 + 4*n*log(e) + 3*log(e)^2)*a^2*b*d^3)*
B^2*x + (2*a*b^2*c^2*d*n^2 - 5*a^2*b*c*d^2*n^2 + (3*n^2 + 2*n*log(e))*a^3*d
^3)*B^2*log(b*x + a) + (B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b
*d^3*x)*log((b*x + a)^n)^2 + (B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2
*a^2*b*d^3*x)*log((d*x + c)^n)^2 + (2*B^2*b^3*d^3*x^3*log(e) + 2*B^2*a^3*d^
3*n*log(b*x + a) + (a*b^2*d^3*(n + 6*log(e)) - b^3*c*d^2*n)*B^2*x^2 + 2*(a^
2*b*d^3*(2*n + 3*log(e)) + b^3*c^2*d*n - 3*a*b^2*c*d^2*n)*B^2*x - 2*(b^3*c^
3*n - 3*a*b^2*c^2*d*n + 3*a^2*b*c*d^2*n)*B^2*log(d*x + c))*log((b*x + a)^n)
 - (2*B^2*b^3*d^3*x^3*log(e) + 2*B^2*a^3*d^3*n*log(b*x + a) + (a*b^2*d^3*(n
 + 6*log(e)) - b^3*c*d^2*n)*B^2*x^2 + 2*(a^2*b*d^3*(2*n + 3*log(e)) + b^3*c
^2*d*n - 3*a*b^2*c*d^2*n)*B^2*x - 2*(b^3*c^3*n - 3*a*b^2*c^2*d*n + 3*a^2*b*
c*d^2*n)*B^2*log(d*x + c) + 2*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^
2*a^2*b*d^3*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2x^2 + 2\,A^2abx + A^2a^2 + \left(B^2b^2x^2 + 2\,B^2abx + B^2a^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\left(ABb^2x^2 + 2\,ABabx + ABa^2\right)\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b^2*x^2 + 2*A^2*a*b*x + A^2*a^2 + (B^2*b^2*x^2 + 2*B^2*a*b*x +
 B^2*a^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*(A*B*b^2*x^2 + 2*A*B*a*b*x +
 A*B*a^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^2 \left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

3.158 $\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx$

Optimal. Leaf size=195

$$-\frac{B^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}-\frac{Bn(bc-ad)^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A+Bn\right)}{bd^2}-\frac{Bn(a+bx)(}{}$$

```
[Out] -((B*(b*c - a*d)*n*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b*d
)) + ((a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(2*b) - (B*(b
*c - a*d)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*n + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n]))/(b*d^2) - (B^2*(b*c - a*d)^2*n^2*PolyLog[2, (d*(a + b*x))
/(b*(c + d*x))])/(b*d^2)
```

Rubi [A] time = 0.485903, antiderivative size = 308, normalized size of antiderivative = 1.58, number of steps used = 15, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{B^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}+\frac{A^2(a+bx)^2}{2b}+\frac{ABn(bc-ad)^2\log(c+dx)}{bd^2}+\frac{AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)\right.}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*n*x)/d) + (A^2*(a + b*x)^2)/(2*b) + (A*B*(b*c - a*d)^2*n
*Log[c + d*x])/(b*d^2) + (B^2*(b*c - a*d)^2*n^2*Log[c + d*x])/(b*d^2) - (B^
2*(b*c - a*d)*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (A*B*(a
 + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/b - (B^2*(b*c - a*d)^2*n*Log[(b
*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) + (B^2*(
a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b) - (B^2*(b*c - a*d)^2*n
^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
```

```
1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \Big(A^2(a+bx) + 2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right) + B^2(a+b$$

$$= \frac{A^2(a+bx)^2}{2b} + (2AB)\int (a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx + B^2$$

$$= \frac{A^2(a+bx)^2}{2b} + \frac{AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{B^2(a+bx}{}$$

$$= \frac{A^2(a+bx)^2}{2b} + \frac{AB(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{B^2(a+bx}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2n\log(c+dx)}{bd^2} + \frac{A}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2n\log(c+dx)}{bd^2} - \frac{B^2}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2n\log(c+dx)}{bd^2} + \frac{B^2}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2n\log(c+dx)}{bd^2} + \frac{B^2}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2n\log(c+dx)}{bd^2} + \frac{B^2}{}$$

$$= -\frac{AB(bc-ad)nx}{d} + \frac{A^2(a+bx)^2}{2b} + \frac{AB(bc-ad)^2n\log(c+dx)}{bd^2} + \frac{B^2}{}$$

Mathematica [B] time = 0.708813, size = 656, normalized size = 3.36

$$\frac{B^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)}{bd^2} - \frac{2a^2ABn}{b} - \frac{2a^2B^2n\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} - \frac{2a^2B^2n^2\log(c+dx)}{b} - \frac{a^2B^2n^2\,\text{lo}}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-2*a^2*A*B*n)/b - (2*a^2*B^2*n^2)/b + (a*B^2*c*n^2)/d + a*A^2*x + a*A*B*n*
x - (A*b*B*c*n*x)/d + (A^2*b*x^2)/2 - (a^2*B^2*n^2*Log[a + b*x]^2)/(2*b) +
(A*b*B*c^2*n*Log[c + d*x])/d^2 - (2*a*A*B*c*n*Log[c + d*x])/d - (2*a^2*B^2*
```

```
n^2*Log[c + d*x])/b + (b*B^2*c^2*n^2*Log[c + d*x])/d^2 - (a*B^2*c*n^2*Log[c
 + d*x])/d + (b*B^2*c^2*n^2*Log[c + d*x]^2)/(2*d^2) - (a*B^2*c*n^2*Log[c +
d*x]^2)/d - (2*a^2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/b + 2*a*A*B*x*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n] + a*B^2*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 - (b*B^2*c*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n])/d + A*b*B*x^2*Log[(e*(a +
 b*x)^n)/(c + d*x)^n] + (b*B^2*c^2*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/d^2 - (2*a*B^2*c*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/
d + a*B^2*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + (b*B^2*x^2*Log[(e*(a + b*x
)^n)/(c + d*x)^n]^2)/2 + (B*n*Log[a + b*x]*(b*B*c*(-(b*c) + 2*a*d)*n*Log[c
+ d*x] + B*(b*c - a*d)^2*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(-(b*B*c*n)
 + a*d*(A + 3*B*n) + a*B*d*Log[(e*(a + b*x)^n)/(c + d*x)^n])))/(b*d^2) + (B
^2*(b*c - a*d)^2*n^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])/(b*d^2)
```

Maple [C] time = 1.651, size = 10210, normalized size = 52.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 3.611, size = 1052, normalized size = 5.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxima
")
```

```
[Out] A*B*b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^2*b*x^2 + 2*A*B*a*x*log((b
*x + a)^n*e/(d*x + c)^n) + A^2*a*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A*B*a/e - (a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 +
(b*c*e*n - a*d*e*n)*x/(b*d))*A*B*b/e + ((n^2 + n*log(e))*b*c^2 - (n^2 + 2*n
*log(e))*a*c*d)*B^2*log(d*x + c)/d^2 + (b^2*c^2*n^2 - 2*a*b*c*d*n^2 + a^2*d
^2*n^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b*d^2) - 1/2*(B^2*a^2*d^2*n^2*log(b*x + a)^2 - B^2*
```

```
b^2*d^2*x^2*log(e)^2 + 2*(b^2*c^2*n^2 - 2*a*b*c*d*n^2)*B^2*log(b*x + a)*log
(d*x + c) - (b^2*c^2*n^2 - 2*a*b*c*d*n^2)*B^2*log(d*x + c)^2 + 2*(b^2*c*d*n
*log(e) - (n*log(e) + log(e)^2)*a*b*d^2)*B^2*x + 2*(a*b*c*d*n^2 - (n^2 + n*
log(e))*a^2*d^2)*B^2*log(b*x + a) - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x)*log
((b*x + a)^n)^2 - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x)*log((d*x + c)^n)^2 -
2*(B^2*b^2*d^2*x^2*log(e) + B^2*a^2*d^2*n*log(b*x + a) + (a*b*d^2*(n + 2*lo
g(e)) - b^2*c*d*n)*B^2*x + (b^2*c^2*n - 2*a*b*c*d*n)*B^2*log(d*x + c))*log(
(b*x + a)^n) + 2*(B^2*b^2*d^2*x^2*log(e) + B^2*a^2*d^2*n*log(b*x + a) + (a*
b*d^2*(n + 2*log(e)) - b^2*c*d*n)*B^2*x + (b^2*c^2*n - 2*a*b*c*d*n)*B^2*log
(d*x + c) + (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x)*log((b*x + a)^n))*log((d*x
+ c)^n))/(b*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bx + A^2a + \left(B^2bx + B^2a\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,(ABbx + ABa)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b*x + A^2*a + (B^2*b*x + B^2*a)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*b*x + A*B*a)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

3.159 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{a+bx}\,dx$

Optimal. Leaf size=131

$$\frac{2Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{b}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{b}-\frac{\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)(B\log(e(a}{b}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - (b*(c + d*x))/(d*(a +
 b*x))])/b) + (2*B*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[2, (b
*(c + d*x))/(d*(a + b*x))])/b + (2*B^2*n^2*PolyLog[3, (b*(c + d*x))/(d*(a +
 b*x))])/b
```

Rubi [A] time = 0.504468, antiderivative size = 227, normalized size of antiderivative = 1.73, number of steps used = 10, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {6742, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{2ABn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}+\frac{2B^2n\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}+\frac{2B^2n^2\text{PolyLog}\left(3,\frac{bc-ad}{d(a+bx)}\right.}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x),x]
```

```
[Out] (A^2*Log[a + b*x])/b - (2*A*B*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])/b - (B^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/b + (2*A*B*n*PolyLog[2, 1 + (b*c - a*d)/(d*(a +
b*x))])/b + (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c -
 a*d)/(d*(a + b*x))])/b + (2*B^2*n^2*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x
))])/b
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
```

```
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{a+bx}\,dx = \int\left(\frac{A^2}{a+bx}+\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{a+bx}+\frac{B^2\log^2(e(a+bx)^n(c+dx)}{a+bx}\right.$$

$$= \frac{A^2\log(a+bx)}{b}+(2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{a+bx}\,dx+B^2\int\frac{\log^2(e(a}{}$$

$$= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{B^2\log\left(-\right.}{}$$

$$= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{B^2\log\left(-\right.}{}$$

$$= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{B^2\log\left(-\right.}{}$$

$$= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{B^2\log\left(-\right.}{}$$

$$= \frac{A^2\log(a+bx)}{b}-\frac{2AB\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{B^2\log\left(-\right.}{}$$

Mathematica [B] time = 0.180241, size = 269, normalized size = 2.05

$$\frac{2ABn\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)+2B^2n\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})+2B^2n^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)+A^2\text{lo}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x),x]
```

```
[Out] (-(A*B*n*Log[(-(b*c) + a*d)/(d*(a + b*x))]^2) + A^2*Log[a + b*x] - 2*A*B*n*
Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*A*B*Lo
g[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - B^2*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*A*B*n*
PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] + 2*B^2*n*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*n^2*PolyLog[3, (b*
(c + d*x))/(d*(a + b*x))])/b
```

Maple [F] time = 2.042, size = 0, normalized size = 0.

$$\int \frac{1}{bx+a}\left(A+B\ln\left(\frac{e\,(bx+a)^{n}}{(dx+c)^{n}}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{B^{2}\log\left(bx+a\right)\log\left(\left(dx+c\right)^{n}\right)^{2}}{b}+\frac{A^{2}\log\left(bx+a\right)}{b}-\int -\frac{B^{2}bc\log\left(e\right)^{2}+2\,ABbc\log\left(e\right)+\left(B^{2}bdx+B^{2}bc\right)\log\left(\left(bx+a\right)^{n}\right)^{2}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x, algorithm="maxima
")
```

```
[Out] B^2*log(b*x + a)*log((d*x + c)^n)^2/b + A^2*log(b*x + a)/b - integrate(-(B^
2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log((b*x + a)^n)^
2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x + 2*(B^2*b*c*log(e) + A*B*b*c +
 (B^2*b*d*log(e) + A*B*b*d)*x)*log((b*x + a)^n) - 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x + (B^2*b*d*n*x + B^2*a*d*n)*log(b*x + a)
+ (B^2*b*d*x + B^2*b*c)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d*x^2 + a*
b*c + (b^2*c + a*b*d)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B^{2}\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)^{2}+2\,AB\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A^{2}}{bx+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(b*x + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}{bx + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a), x)
```

3.160 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^2} dx$

Optimal. Leaf size=129

$$-\frac{2Bn(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{(a+bx)(bc-ad)}-\frac{2B^2n^2(c+dx)}{(a+bx)(bc-ad)}$$

```
[Out] (-2*B^2*n^2*(c + d*x))/((b*c - a*d)*(a + b*x)) - (2*B*n*(c + d*x)*(A + B*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]))/((b*c - a*d)*(a + b*x)) - ((c + d*x)*(A +
B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*d)*(a + b*x))
```

Rubi [A] time = 0.182181, antiderivative size = 189, normalized size of antiderivative = 1.47, number of steps used = 7, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {6742, 2490, 32}

$$-\frac{A^2}{b(a+bx)}-\frac{2AB(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{2ABn}{b(a+bx)}-\frac{B^2(c+dx)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{2B^2n(c+dx}{(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^2,x]
```

```
[Out] -(A^2/(b*(a + b*x))) - (2*A*B*n)/(b*(a + b*x)) - (2*B^2*n^2)/(b*(a + b*x))
- (2*A*B*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*c - a*d)*(a + b*x)
) - (2*B^2*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*c - a*d)*(a +
b*x)) - (B^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)*(a
+ b*x))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
```

```
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^2}\,dx = \int \left(\frac{A^2}{(a+bx)^2} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^2} + \frac{B^2\log^2(e(a+bx)^n(c+d}{(a+bx)^2}\right.$$
$$= -\frac{A^2}{b(a+bx)} + (2AB)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^2}\,dx + B^2\int \frac{\log^2(e(a+bx}{(a+}$$
$$= -\frac{A^2}{b(a+bx)} - \frac{2AB(c+dx)\log(e(a+bx)^n(c+dx)^{-n})}{(bc-ad)(a+bx)} - \frac{B^2(c+dx)\log^2(e(a}{(bc-ad)}$$
$$= -\frac{A^2}{b(a+bx)} - \frac{2ABn}{b(a+bx)} - \frac{2AB(c+dx)\log(e(a+bx)^n(c+dx)^{-n})}{(bc-ad)(a+bx)} - \frac{2B^2n(c}{}$$
$$= -\frac{A^2}{b(a+bx)} - \frac{2ABn}{b(a+bx)} - \frac{2B^2n^2}{b(a+bx)} - \frac{2AB(c+dx)\log(e(a+bx)^n(c+dx)^{}}{(bc-ad)(a+bx)}$$

Mathematica [A] time = 0.370513, size = 236, normalized size = 1.83

$$\frac{-(bc-ad)\left(2B(A+Bn)\log(e(a+bx)^n(c+dx)^{-n}) + B^2\log^2(e(a+bx)^n(c+dx)^{-n}) + A^2 + 2ABn + 2B^2n^2\right) - 2Bdn(a+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^2,x]
```

```
[Out] (B^2*d*n^2*(a + b*x)*Log[a + b*x]^2 + B^2*d*n^2*(a + b*x)*Log[c + d*x]^2 + 
2*B*d*n*(a + b*x)*Log[c + d*x]*(A + B*n + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
]) - 2*B*d*n*(a + b*x)*Log[a + b*x]*(A + B*n + B*n*Log[c + d*x] + B*Log[(e*
(a + b*x)^n)/(c + d*x)^n]) - (b*c - a*d)*(A^2 + 2*A*B*n + 2*B^2*n^2 + 2*B*(
A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + B^2*Log[(e*(a + b*x)^n)/(c + d*
x)^n]^2))/(b*(b*c - a*d)*(a + b*x))
```

Maple [C] time = 1.365, size = 10098, normalized size = 78.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.25491, size = 606, normalized size = 4.7

$$-B^2\left(\frac{2\left(\frac{den\log(bx+a)}{b^2c-abd}-\frac{den\log(dx+c)}{b^2c-abd}+\frac{en}{b^2x+ab}\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)}{e}+\frac{2\,bce^2n^2-2\,ade^2n^2-\left(bde^2n^2x+ade^2n^2\right)\log(bx+a)^2-\left(bde\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x, algorithm="maxi
ma")
```

```
[Out] -B^2*(2*(d*e*n*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a
*b*d) + e*n/(b^2*x + a*b))*log((b*x + a)^n*e/(d*x + c)^n)/e + (2*b*c*e^2*n^
2 - 2*a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a)^2 - (b*d*e^2
*n^2*x + a*d*e^2*n^2)*log(d*x + c)^2 + 2*(b*d*e^2*n^2*x + a*d*e^2*n^2)*log(
b*x + a) - 2*(b*d*e^2*n^2*x + a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*l
og(b*x + a))*log(d*x + c))/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x)*e^2))
 - B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^2*x + a*b) - 2*(d*e*n*log(b*x +
a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) + e*n/(b^2*x + a*b)
)*A*B/e - 2*A*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^2*x + a*b) - A^2/(b^2*x +
 a*b)
```

Fricas [B] time = 1.11469, size = 755, normalized size = 5.85

$$-\frac{A^2bc-A^2ad+2\left(B^2bc-B^2ad\right)n^2+\left(B^2bdn^2x+B^2bcn^2\right)\log(bx+a)^2+\left(B^2bdn^2x+B^2bcn^2\right)\log(dx+c)^2+\left(B^2bc-B\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x, algorithm="fric
as")
```

```
[Out] -(A^2*b*c - A^2*a*d + 2*(B^2*b*c - B^2*a*d)*n^2 + (B^2*b*d*n^2*x + B^2*b*c*
n^2)*log(b*x + a)^2 + (B^2*b*d*n^2*x + B^2*b*c*n^2)*log(d*x + c)^2 + (B^2*b
*c - B^2*a*d)*log(e)^2 + 2*(A*B*b*c - A*B*a*d)*n + 2*(B^2*b*c*n^2 + A*B*b*c
*n + (B^2*b*d*n^2 + A*B*b*d*n)*x + (B^2*b*d*n*x + B^2*b*c*n)*log(e))*log(b*
x + a) - 2*(B^2*b*c*n^2 + A*B*b*c*n + (B^2*b*d*n^2 + A*B*b*d*n)*x + (B^2*b*
d*n^2*x + B^2*b*c*n^2)*log(b*x + a) + (B^2*b*d*n*x + B^2*b*c*n)*log(e))*log
(d*x + c) + 2*(A*B*b*c - A*B*a*d + (B^2*b*c - B^2*a*d)*n)*log(e))/(a*b^2*c
- a^2*b*d + (b^3*c - a*b^2*d)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^2, x)
```

3.161 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^3} dx$

Optimal. Leaf size=274

$$-\frac{bBn(c+dx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{2(a+bx)^2(bc-ad)^2}+\frac{2Bdn(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)^2}-\frac{b(c+dx)^2(B\log(}{2(a+}$$

```
[Out] (2*B^2*d*n^2*(c + d*x))/((b*c - a*d)^2*(a + b*x)) - (b*B^2*n^2*(c + d*x)^2)
/(4*(b*c - a*d)^2*(a + b*x)^2) + (2*B*d*n*(c + d*x)*(A + B*Log[(e*(a + b*x)
^n)/(c + d*x)^n]))/((b*c - a*d)^2*(a + b*x)) - (b*B*n*(c + d*x)^2*(A + B*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*(b*c - a*d)^2*(a + b*x)^2) + (d*(c + d*
x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*d)^2*(a + b*x)) -
(b*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(2*(b*c - a*d)^2
*(a + b*x)^2)
```

Rubi [A] time = 0.423289, antiderivative size = 411, normalized size of antiderivative = 1.5, number of steps used = 12, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {6742, 2492, 44, 2491, 2490, 32, 2509, 37}

$$-\frac{A^2}{2b(a+bx)^2}+\frac{ABd^2n\log(a+bx)}{b(bc-ad)^2}-\frac{ABd^2n\log(c+dx)}{b(bc-ad)^2}-\frac{AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b(a+bx)^2}+\frac{ABdn}{b(a+bx)(bc-ad)}-\frac{AB}{2b(a+}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^3,x]
```

```
[Out] -A^2/(2*b*(a + b*x)^2) - (A*B*n)/(2*b*(a + b*x)^2) + (A*B*d*n)/(b*(b*c - a*
d)*(a + b*x)) + (2*B^2*d*n^2)/(b*(b*c - a*d)*(a + b*x)) - (b*B^2*n^2*(c + d
*x)^2)/(4*(b*c - a*d)^2*(a + b*x)^2) + (A*B*d^2*n*Log[a + b*x])/(b*(b*c - a
*d)^2) - (A*B*d^2*n*Log[c + d*x])/(b*(b*c - a*d)^2) - (A*B*Log[(e*(a + b*x)
^n)/(c + d*x)^n])/(b*(a + b*x)^2) + (2*B^2*d*n*(c + d*x)*Log[(e*(a + b*x)^n
)/(c + d*x)^n])/((b*c - a*d)^2*(a + b*x)) - (b*B^2*n*(c + d*x)^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(2*(b*c - a*d)^2*(a + b*x)^2) + (B^2*d*(c + d*x)*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)^2*(a + b*x)) - (b*B^2*(c + d
*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*c - a*d)^2*(a + b*x)^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
```

```
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rubi steps

$$\begin{aligned}\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^3}dx &= \int\left(\frac{A^2}{(a+bx)^3}+\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3}+\frac{B^2\log^2(e(a+bx)^n(c+dx\right.\\ &= -\frac{A^2}{2b(a+bx)^2}+(2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3}dx+B^2\int\frac{\log^2(e(a+b}{(a+}\\ &= -\frac{A^2}{2b(a+bx)^2}-\frac{AB\log(e(a+bx)^n(c+dx)^{-n})}{b(a+bx)^2}+\frac{\left(bB^2\right)\int\frac{(c+dx)\log^2(e(a+bx)^n(c+}{(a+bx)^3}}{bc-ad}\\ &= -\frac{A^2}{2b(a+bx)^2}-\frac{AB\log(e(a+bx)^n(c+dx)^{-n})}{b(a+bx)^2}+\frac{B^2d(c+dx)\log^2(e(a+bx)^}{(bc-ad)^2(a+bx}\\ &= -\frac{A^2}{2b(a+bx)^2}-\frac{ABn}{2b(a+bx)^2}+\frac{ABdn}{b(bc-ad)(a+bx)}+\frac{ABd^2n\log(a+bx)}{b(bc-ad)^2}-\frac{A}{}\\ &= -\frac{A^2}{2b(a+bx)^2}-\frac{ABn}{2b(a+bx)^2}+\frac{ABdn}{b(bc-ad)(a+bx)}+\frac{2B^2dn^2}{b(bc-ad)(a+bx)}-\frac{}{4(b}\end{aligned}$$

Mathematica [A] time = 0.530402, size = 332, normalized size = 1.21

$$-\frac{(bc-ad)\left(2A^2(bc-ad)+2B(2A(bc-ad)+Bn(-3ad+bc-2bdx))\log(e(a+bx)^n(c+dx)^{-n})+2ABn(-3ad+bc-2bd\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^3,x]
```

```
[Out] -(2*B^2*d^2*n^2*(a + b*x)^2*Log[a + b*x]^2 + 2*B^2*d^2*n^2*(a + b*x)^2*Log[
c + d*x]^2 + 2*B*d^2*n*(a + b*x)^2*Log[c + d*x]*(2*A + 3*B*n + 2*B*Log[(e*(
a + b*x)^n)/(c + d*x)^n]) - 2*B*d^2*n*(a + b*x)^2*Log[a + b*x]*(2*A + 3*B*n
 + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + (b*c - a*d)
*(2*A^2*(b*c - a*d) + B^2*n^2*(b*c - 7*a*d - 6*b*d*x) + 2*A*B*n*(b*c - 3*a*
d - 2*b*d*x) + 2*B*(2*A*(b*c - a*d) + B*n*(b*c - 3*a*d - 2*b*d*x))*Log[(e*(
a + b*x)^n)/(c + d*x)^n] + 2*B^2*(b*c - a*d)*Log[(e*(a + b*x)^n)/(c + d*x)^
n]^2))/(4*b*(b*c - a*d)^2*(a + b*x)^2)
```

Maple [C] time = 1.968, size = 17300, normalized size = 63.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.47313, size = 1214, normalized size = 4.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/4*B^2*(2*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*
d^2*e*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b
*c*e*n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3
*c - a^2*b^2*d)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e - (b^2*c^2*e^2*n^2 - 8
*a*b*c*d*e^2*n^2 + 7*a^2*d^2*e^2*n^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e
^2*n^2*x + a^2*d^2*e^2*n^2)*log(b*x + a)^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b
*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*log(d*x + c)^2 - 6*(b^2*c*d*e^2*n^2 - a*b
*d^2*e^2*n^2)*x - 6*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^
2*n^2)*log(b*x + a) + 2*(3*b^2*d^2*e^2*n^2*x^2 + 6*a*b*d^2*e^2*n^2*x + 3*a^
2*d^2*e^2*n^2 - 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*
n^2)*log(b*x + a))*log(d*x + c))/((a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2
```

```
+ (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d
+ a^3*b^2*d^2)*x)*e^2)) - 1/2*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^3*x^2
 + 2*a*b^2*x + a^2*b) + 1/2*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d
+ a^2*b*d^2) - 2*d^2*e*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) +
 (2*b*d*e*n*x - b*c*e*n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*
d)*x^2 + 2*(a*b^3*c - a^2*b^2*d)*x))*A*B/e - A*B*log((b*x + a)^n*e/(d*x + c
)^n)/(b^3*x^2 + 2*a*b^2*x + a^2*b) - 1/2*A^2/(b^3*x^2 + 2*a*b^2*x + a^2*b)
```

Fricas [B] time = 1.21899, size = 1918, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x, algorithm="fric
as")
```

```
[Out] -1/4*(2*A^2*b^2*c^2 - 4*A^2*a*b*c*d + 2*A^2*a^2*d^2 + (B^2*b^2*c^2 - 8*B^2*
a*b*c*d + 7*B^2*a^2*d^2)*n^2 - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^2*a*b*d^2*n^2*x
 - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n^2)*log(b*x + a)^2 - 2*(B^2*b^2*d^2*n^2*x
^2 + 2*B^2*a*b*d^2*n^2*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n^2)*log(d*x + c)^
2 + 2*(B^2*b^2*c^2 - 2*B^2*a*b*c*d + B^2*a^2*d^2)*log(e)^2 + 2*(A*B*b^2*c^2
 - 4*A*B*a*b*c*d + 3*A*B*a^2*d^2)*n - 2*(3*(B^2*b^2*c*d - B^2*a*b*d^2)*n^2
+ 2*(A*B*b^2*c*d - A*B*a*b*d^2)*n)*x + 2*((B^2*b^2*c^2 - 4*B^2*a*b*c*d)*n^2
 - (3*B^2*b^2*d^2*n^2 + 2*A*B*b^2*d^2*n)*x^2 + 2*(A*B*b^2*c^2 - 2*A*B*a*b*c
*d)*n - 2*(2*A*B*a*b*d^2*n + (B^2*b^2*c*d + 2*B^2*a*b*d^2)*n^2)*x - 2*(B^2*
b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n)*log(e)
)*log(b*x + a) - 2*((B^2*b^2*c^2 - 4*B^2*a*b*c*d)*n^2 - (3*B^2*b^2*d^2*n^2
+ 2*A*B*b^2*d^2*n)*x^2 + 2*(A*B*b^2*c^2 - 2*A*B*a*b*c*d)*n - 2*(2*A*B*a*b*d
^2*n + (B^2*b^2*c*d + 2*B^2*a*b*d^2)*n^2)*x - 2*(B^2*b^2*d^2*n^2*x^2 + 2*B^
2*a*b*d^2*n^2*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n^2)*log(b*x + a) - 2*(B^2*
b^2*d^2*n*x^2 + 2*B^2*a*b*d^2*n*x - (B^2*b^2*c^2 - 2*B^2*a*b*c*d)*n)*log(e)
)*log(d*x + c) + 2*(2*A*B*b^2*c^2 - 4*A*B*a*b*c*d + 2*A*B*a^2*d^2 - 2*(B^2*
b^2*c*d - B^2*a*b*d^2)*n*x + (B^2*b^2*c^2 - 4*B^2*a*b*c*d + 3*B^2*a^2*d^2)*
n)*log(e))/(a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*
d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^2}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^3, x)
```

3.162 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^4}\,dx$

Optimal. Leaf size=427

$$-\frac{b^2(c+dx)^3(B\log(e(a+bx)^n(c+dx)^{-n})+A)^2}{3(a+bx)^3(bc-ad)^3}-\frac{2b^2Bn(c+dx)^3(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{9(a+bx)^3(bc-ad)^3}-\frac{d^2(c+dx)(B\log}{(a}$$

```
[Out] (-2*B^2*d^2*n^2*(c + d*x))/((b*c - a*d)^3*(a + b*x)) + (b*B^2*d*n^2*(c + d*
x)^2)/(2*(b*c - a*d)^3*(a + b*x)^2) - (2*b^2*B^2*n^2*(c + d*x)^3)/(27*(b*c
- a*d)^3*(a + b*x)^3) - (2*B*d^2*n*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]))/((b*c - a*d)^3*(a + b*x)) + (b*B*d*n*(c + d*x)^2*(A + B*Log[(e*
(a + b*x)^n)/(c + d*x)^n]))/((b*c - a*d)^3*(a + b*x)^2) - (2*b^2*B*n*(c + d
*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(9*(b*c - a*d)^3*(a + b*x)^
3) - (d^2*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*d
)^3*(a + b*x)) + (b*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^
2)/((b*c - a*d)^3*(a + b*x)^2) - (b^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])^2)/(3*(b*c - a*d)^3*(a + b*x)^3)
```

Rubi [C] time = 1.21235, antiderivative size = 730, normalized size of antiderivative = 1.71, number of steps used = 26, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315}

$$-\frac{2B^2d^3n^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b(bc-ad)^3}-\frac{2B^2d^3n^2\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{3b(bc-ad)^3}-\frac{A^2}{3b(a+bx)^3}-\frac{2ABd^2n}{3b(a+bx)(bc-ad)^2}-\frac{2ABd^3n\log(}{3b(bc-a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^4,x]
```

```
[Out] -A^2/(3*b*(a + b*x)^3) - (2*A*B*n)/(9*b*(a + b*x)^3) - (2*B^2*n^2)/(27*b*(a
 + b*x)^3) + (A*B*d*n)/(3*b*(b*c - a*d)*(a + b*x)^2) + (5*B^2*d*n^2)/(18*b*
(b*c - a*d)*(a + b*x)^2) - (2*A*B*d^2*n)/(3*b*(b*c - a*d)^2*(a + b*x)) - (1
1*B^2*d^2*n^2)/(9*b*(b*c - a*d)^2*(a + b*x)) - (2*A*B*d^3*n*Log[a + b*x])/(
3*b*(b*c - a*d)^3) - (5*B^2*d^3*n^2*Log[a + b*x])/(9*b*(b*c - a*d)^3) + (2*
A*B*d^3*n*Log[c + d*x])/(3*b*(b*c - a*d)^3) + (5*B^2*d^3*n^2*Log[c + d*x])/
(9*b*(b*c - a*d)^3) - (2*A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(a + b*
x)^3) - (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(9*b*(a + b*x)^3) + (B^2
*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)*(a + b*x)^2) - (2*B
^2*d^2*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*(b*c - a*d)^3*(a +
b*x)) + (2*B^2*d^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/
```

```
(c + d*x)^n])/(3*b*(b*c - a*d)^3) - (2*B^2*d^3*n*Log[(b*c - a*d)/(b*(c + d*
x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)^3) - (B^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/(3*b*(a + b*x)^3) - (2*B^2*d^3*n^2*PolyLog[2, (d
*(a + b*x))/(b*(c + d*x))])/(3*b*(b*c - a*d)^3) - (2*B^2*d^3*n^2*PolyLog[2,
 1 + (b*c - a*d)/(d*(a + b*x))])/(3*b*(b*c - a*d)^3)
```

<u>Rule 6742</u>

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

<u>Rule 2492</u>

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

<u>Rule 44</u>

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

<u>Rule 2514</u>

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

<u>Rule 2490</u>

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^4}\,dx = \int \left(\frac{A^2}{(a+bx)^4} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4} + \frac{B^2\log^2(e(a+bx)^n(c+d}{(a+bx)^4}\right.$$

$$= -\frac{A^2}{3b(a+bx)^3} + (2AB)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4}\,dx + B^2\int \frac{\log^2(e(a+}{(a}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{3b(a+bx)^3} - \frac{B^2\log^2(e(a+bx)^n(c+d}{3b(a+bx)^3}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{3b(a+bx)^3} - \frac{B^2\log^2(e(a+bx)^n(c+d}{3b(a+bx)^3}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2ABn}{9b(a+bx)^3} + \frac{ABdn}{3b(bc-ad)(a+bx)^2} - \frac{2ABd^2n}{3b(bc-ad)^2(a+bx)}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2ABn}{9b(a+bx)^3} + \frac{ABdn}{3b(bc-ad)(a+bx)^2} - \frac{2ABd^2n}{3b(bc-ad)^2(a+bx)}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2ABn}{9b(a+bx)^3} + \frac{ABdn}{3b(bc-ad)(a+bx)^2} - \frac{2ABd^2n}{3b(bc-ad)^2(a+bx)}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2ABn}{9b(a+bx)^3} - \frac{2B^2n^2}{27b(a+bx)^3} + \frac{ABdn}{3b(bc-ad)(a+bx)^2} + \frac{}{18b(}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2ABn}{9b(a+bx)^3} - \frac{2B^2n^2}{27b(a+bx)^3} + \frac{ABdn}{3b(bc-ad)(a+bx)^2} + \frac{}{18b(}$$

$$= -\frac{A^2}{3b(a+bx)^3} - \frac{2ABn}{9b(a+bx)^3} - \frac{2B^2n^2}{27b(a+bx)^3} + \frac{ABdn}{3b(bc-ad)(a+bx)^2} + \frac{}{18b(}$$

Mathematica [A] time = 0.743327, size = 432, normalized size = 1.01

$$\frac{-(bc-ad)\left(6B\left(Bn\left(11a^2d^2 + abd(15dx-7c) + b^2\left(2c^2-3cdx+6d^2x^2\right)\right) + 6A(bc-ad)^2\right)\log(e(a+bx)^n(c+dx)^{-n}) + 6}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^4,x]
```

```
[Out] (18*B^2*d^3*n^2*(a + b*x)^3*Log[a + b*x]^2 + 18*B^2*d^3*n^2*(a + b*x)^3*Log
[c + d*x]^2 + 6*B*d^3*n*(a + b*x)^3*Log[c + d*x]*(6*A + 11*B*n + 6*B*Log[(e
```

```
*(a + b*x)^n)/(c + d*x)^n]) - 6*B*d^3*n*(a + b*x)^3*Log[a + b*x]*(6*A + 11*
B*n + 6*B*n*Log[c + d*x] + 6*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) - (b*c - a
*d)*(18*A^2*(b*c - a*d)^2 + 6*A*B*n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b
^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)) + B^2*n^2*(85*a^2*d^2 + a*b*d*(-23*c + 14
7*d*x) + b^2*(4*c^2 - 15*c*d*x + 66*d^2*x^2)) + 6*B*(6*A*(b*c - a*d)^2 + B*
n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x + 6*d^2*x^2)))
*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B^2*(b*c - a*d)^2*Log[(e*(a + b*x)^n
)/(c + d*x)^n]^2))/(54*b*(b*c - a*d)^3*(a + b*x)^3)
```

Maple [C] time = 2.658, size = 25057, normalized size = 58.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.7076, size = 2025, normalized size = 4.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x, algorithm="maxi
ma")
```

```
[Out] -1/54*B^2*(6*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c
*d^2 - a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*
n + 11*a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^
4*b^2*c*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^
5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e + (4*b^3*c^3*e^2*n^2 - 2
7*a*b^2*c^2*d*e^2*n^2 + 108*a^2*b*c*d^2*e^2*n^2 - 85*a^3*d^3*e^2*n^2 + 66*(
b^3*c*d^2*e^2*n^2 - a*b^2*d^3*e^2*n^2)*x^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*
b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a)
^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^
```

```
2*x + a^3*d^3*e^2*n^2)*log(d*x + c)^2 - 3*(5*b^3*c^2*d*e^2*n^2 - 54*a*b^2*c
*d^2*e^2*n^2 + 49*a^2*b*d^3*e^2*n^2)*x + 66*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*
d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a) - 6
*(11*b^3*d^3*e^2*n^2*x^3 + 33*a*b^2*d^3*e^2*n^2*x^2 + 33*a^2*b*d^3*e^2*n^2*
x + 11*a^3*d^3*e^2*n^2 - 6*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 +
 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a))*log(d*x + c))/((a^3
*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b
^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^
2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d
 + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*x)*e^2)) - 1/3*B^2*log((b*x + a)^n*e/(d*x
 + c)^n)^2/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*b) - 1/9*(6*d^3*e*n*l
og(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) - 6*d^3
*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) +
 (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*n + 11*a^2*d^2*e*n - 3*(b
^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2 + (
b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a
^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*x))*A*B/e -
 2/3*A*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*
x + a^3*b) - 1/3*A^2/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*b)
```

Fricas [B] time = 1.40228, size = 3351, normalized size = 7.85

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x, algorithm="fric
as")
```

```
[Out] -1/54*(18*A^2*b^3*c^3 - 54*A^2*a*b^2*c^2*d + 54*A^2*a^2*b*c*d^2 - 18*A^2*a^
3*d^3 + (4*B^2*b^3*c^3 - 27*B^2*a*b^2*c^2*d + 108*B^2*a^2*b*c*d^2 - 85*B^2*
a^3*d^3)*n^2 + 6*(11*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n^2 + 6*(A*B*b^3*c*d^2
 - A*B*a*b^2*d^3)*n)*x^2 + 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*x^
2 + 3*B^2*a^2*b*d^3*n^2*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*
c*d^2)*n^2)*log(b*x + a)^2 + 18*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*
x^2 + 3*B^2*a^2*b*d^3*n^2*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*
b*c*d^2)*n^2)*log(d*x + c)^2 + 18*(B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*
a^2*b*c*d^2 - B^2*a^3*d^3)*log(e)^2 + 6*(2*A*B*b^3*c^3 - 9*A*B*a*b^2*c^2*d
+ 18*A*B*a^2*b*c*d^2 - 11*A*B*a^3*d^3)*n - 3*((5*B^2*b^3*c^2*d - 54*B^2*a*b
^2*c*d^2 + 49*B^2*a^2*b*d^3)*n^2 + 6*(A*B*b^3*c^2*d - 6*A*B*a*b^2*c*d^2 + 5
*A*B*a^2*b*d^3)*n)*x + 6*((11*B^2*b^3*d^3*n^2 + 6*A*B*b^3*d^3*n)*x^3 + (2*B
^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B*a*b^2*d
```

```
^3*n + (2*B^2*b^3*c*d^2 + 9*B^2*a*b^2*d^3)*n^2)*x^2 + 6*(A*B*b^3*c^3 - 3*A*
B*a*b^2*c^2*d + 3*A*B*a^2*b*c*d^2)*n + 3*(6*A*B*a^2*b*d^3*n - (B^2*b^3*c^2*
d - 6*B^2*a*b^2*c*d^2 - 6*B^2*a^2*b*d^3)*n^2)*x + 6*(B^2*b^3*d^3*n*x^3 + 3*
B^2*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*
d + 3*B^2*a^2*b*c*d^2)*n)*log(e))*log(b*x + a) - 6*((11*B^2*b^3*d^3*n^2 + 6
*A*B*b^3*d^3*n)*x^3 + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a^2*b*c*d
^2)*n^2 + 3*(6*A*B*a*b^2*d^3*n + (2*B^2*b^3*c*d^2 + 9*B^2*a*b^2*d^3)*n^2)*x
^2 + 6*(A*B*b^3*c^3 - 3*A*B*a*b^2*c^2*d + 3*A*B*a^2*b*c*d^2)*n + 3*(6*A*B*a
^2*b*d^3*n - (B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 - 6*B^2*a^2*b*d^3)*n^2)*x +
 6*(B^2*b^3*d^3*n^2*x^3 + 3*B^2*a*b^2*d^3*n^2*x^2 + 3*B^2*a^2*b*d^3*n^2*x +
 (B^2*b^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*n^2)*log(b*x + a) +
6*(B^2*b^3*d^3*n*x^3 + 3*B^2*a*b^2*d^3*n*x^2 + 3*B^2*a^2*b*d^3*n*x + (B^2*b
^3*c^3 - 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*n)*log(e))*log(d*x + c) + 6
*(6*A*B*b^3*c^3 - 18*A*B*a*b^2*c^2*d + 18*A*B*a^2*b*c*d^2 - 6*A*B*a^3*d^3 +
 6*(B^2*b^3*c*d^2 - B^2*a*b^2*d^3)*n*x^2 - 3*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c
*d^2 + 5*B^2*a^2*b*d^3)*n*x + (2*B^2*b^3*c^3 - 9*B^2*a*b^2*c^2*d + 18*B^2*a
^2*b*c*d^2 - 11*B^2*a^3*d^3)*n)*log(e))/(a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*
a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3
*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^
3)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(bx+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^4,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^4, x)
```

3.163 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^5}\,dx$

Optimal. Leaf size=587

$$-\frac{b^3(c+dx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{4(a+bx)^4(bc-ad)^4}-\frac{b^3Bn(c+dx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{8(a+bx)^4(bc-ad)^4}+\frac{b^2d(c+dx)^3\left(B\log\right.}{(a+}$$

```
[Out] (2*B^2*d^3*n^2*(c + d*x))/((b*c - a*d)^4*(a + b*x)) - (3*b*B^2*d^2*n^2*(c +
 d*x)^2)/(4*(b*c - a*d)^4*(a + b*x)^2) + (2*b^2*B^2*d*n^2*(c + d*x)^3)/(9*(
b*c - a*d)^4*(a + b*x)^3) - (b^3*B^2*n^2*(c + d*x)^4)/(32*(b*c - a*d)^4*(a
+ b*x)^4) + (2*B*d^3*n*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/
((b*c - a*d)^4*(a + b*x)) - (3*b*B*d^2*n*(c + d*x)^2*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n]))/(2*(b*c - a*d)^4*(a + b*x)^2) + (2*b^2*B*d*n*(c + d*x)^
3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(3*(b*c - a*d)^4*(a + b*x)^3) -
 (b^3*B*n*(c + d*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(8*(b*c - a
*d)^4*(a + b*x)^4) + (d^3*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]
)^2)/((b*c - a*d)^4*(a + b*x)) - (3*b*d^2*(c + d*x)^2*(A + B*Log[(e*(a + b*
x)^n)/(c + d*x)^n])^2)/(2*(b*c - a*d)^4*(a + b*x)^2) + (b^2*d*(c + d*x)^3*(
A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*d)^4*(a + b*x)^3) - (b
^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(4*(b*c - a*d)^4
*(a + b*x)^4)
```

Rubi [C] time = 1.40797, antiderivative size = 843, normalized size of antiderivative = 1.44, number of steps used = 29, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315}

$$\frac{13B^2n^2\log(a+bx)d^4}{24b(bc-ad)^4}+\frac{ABn\log(a+bx)d^4}{2b(bc-ad)^4}-\frac{13B^2n^2\log(c+dx)d^4}{24b(bc-ad)^4}-\frac{ABn\log(c+dx)d^4}{2b(bc-ad)^4}-\frac{B^2n\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log\left(e(a+\right.}{2b(bc-ad}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^5,x]
```

```
[Out] -A^2/(4*b*(a + b*x)^4) - (A*B*n)/(8*b*(a + b*x)^4) - (B^2*n^2)/(32*b*(a + b
*x)^4) + (A*B*d*n)/(6*b*(b*c - a*d)*(a + b*x)^3) + (7*B^2*d*n^2)/(72*b*(b*c
 - a*d)*(a + b*x)^3) - (A*B*d^2*n)/(4*b*(b*c - a*d)^2*(a + b*x)^2) - (13*B^
2*d^2*n^2)/(48*b*(b*c - a*d)^2*(a + b*x)^2) + (A*B*d^3*n)/(2*b*(b*c - a*d)^
3*(a + b*x)) + (25*B^2*d^3*n^2)/(24*b*(b*c - a*d)^3*(a + b*x)) + (A*B*d^4*n
*Log[a + b*x])/(2*b*(b*c - a*d)^4) + (13*B^2*d^4*n^2*Log[a + b*x])/(24*b*(b
*c - a*d)^4) - (A*B*d^4*n*Log[c + d*x])/(2*b*(b*c - a*d)^4) - (13*B^2*d^4*n
```

```
^2*Log[c + d*x])/(24*b*(b*c - a*d)^4) - (A*B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/(2*b*(a + b*x)^4) - (B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(a +
b*x)^4) + (B^2*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(6*b*(b*c - a*d)*(a +
b*x)^3) - (B^2*d^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*(b*c - a*d)^2*(
a + b*x)^2) + (B^2*d^3*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*(b*
c - a*d)^4*(a + b*x)) - (B^2*d^4*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e
*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) + (B^2*d^4*n*Log[(b*c - a*d
)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) - (B
^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(a + b*x)^4) + (B^2*d^4*n^2*Pol
yLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b*(b*c - a*d)^4) + (B^2*d^4*n^2*Po
lyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(2*b*(b*c - a*d)^4)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
```

```
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(a+bx)^5}\,dx = \int\left(\frac{A^2}{(a+bx)^5}+\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^5}+\frac{B^2\log^2(e(a+bx)^n(c+d}{(a+bx)^5}\right.$$

$$= -\frac{A^2}{4b(a+bx)^4}+(2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^5}\,dx+B^2\int\frac{\log^2(e(a+}{(a}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{AB\log(e(a+bx)^n(c+dx)^{-n})}{2b(a+bx)^4}-\frac{B^2\log^2(e(a+bx)^n(c+dx}{4b(a+bx)^4}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{AB\log(e(a+bx)^n(c+dx)^{-n})}{2b(a+bx)^4}-\frac{B^2\log^2(e(a+bx)^n(c+dx}{4b(a+bx)^4}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}-\frac{ABd^2n}{4b(bc-ad)^2(a+bx)}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}-\frac{ABd^2n}{4b(bc-ad)^2(a+bx)}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}-\frac{ABd^2n}{4b(bc-ad)^2(a+bx)}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}-\frac{B^2n^2}{32b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}+\frac{}{72b(}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}-\frac{B^2n^2}{32b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}+\frac{}{72b(}$$

$$= -\frac{A^2}{4b(a+bx)^4}-\frac{ABn}{8b(a+bx)^4}-\frac{B^2n^2}{32b(a+bx)^4}+\frac{ABdn}{6b(bc-ad)(a+bx)^3}+\frac{}{72b(}$$

Mathematica [A] time = 1.07058, size = 1011, normalized size = 1.72

$$-\frac{9\left(8A^2+4BnA+16B\left(-n\log(a+bx)+n\log(c+dx)+\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)A+B^2n^2+8B^2\left(-n\log(a+bx)+\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(a + b*x)^5,x]
```

```
[Out] -(72*b*B^2*n^2*(-4*a^3*d^3*(c + d*x) + 6*a^2*b*d^2*(c^2 - d^2*x^2) - 4*a*b^
2*d*(c^3 + d^3*x^3) + b^3*(c^4 - d^4*x^4))*Log[a + b*x]^2 + 72*b*B^2*n^2*(-
4*a^3*d^3*(c + d*x) + 6*a^2*b*d^2*(c^2 - d^2*x^2) - 4*a*b^2*d*(c^3 + d^3*x^
3) + b^3*(c^4 - d^4*x^4))*Log[c + d*x]^2 - 4*B*d*(b*c - a*d)^3*n*(a + b*x)*
(12*A + 7*B*n + 12*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)
^n)/(c + d*x)^n])) + 6*B*d^2*(b*c - a*d)^2*n*(a + b*x)^2*(12*A + 13*B*n + 1
2*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n])
) - 12*B*d^3*(b*c - a*d)*n*(a + b*x)^3*(12*A + 25*B*n + 12*B*(-(n*Log[a + b
*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n])) - 12*B*d^4*n*(a
+ b*x)^4*Log[a + b*x]*(12*A + 25*B*n + 12*B*(-(n*Log[a + b*x]) + n*Log[c +
d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n])) + 12*B*d^4*n*(a + b*x)^4*Log[c +
d*x]*(12*A + 25*B*n + 12*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a
+ b*x)^n)/(c + d*x)^n])) + 9*(b*c - a*d)^4*(8*A^2 + 4*A*B*n + B^2*n^2 + 16*
A*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n])
 + 4*B^2*n*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d
*x)^n]) + 8*B^2*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(
c + d*x)^n])^2) - 12*B*(b*c - a*d)*n*Log[a + b*x]*(4*B*d*(b*c - a*d)^2*n*(a
 + b*x) + 6*B*d^2*(-(b*c) + a*d)*n*(a + b*x)^2 + 12*B*d^3*n*(a + b*x)^3 - 3
*(b*c - a*d)^3*(4*A + B*n + 4*B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(
e*(a + b*x)^n)/(c + d*x)^n]))) + 12*B*n*Log[c + d*x]*(4*B*d*(b*c - a*d)^3*n
*(a + b*x) - 6*B*d^2*(b*c - a*d)^2*n*(a + b*x)^2 + 12*B*d^3*(b*c - a*d)*n*(
a + b*x)^3 - 12*B*(b*c - a*d)^4*n*Log[a + b*x] + 12*B*d^4*n*(a + b*x)^4*Log
[a + b*x] - 3*(b*c - a*d)^4*(4*A + B*n + 4*B*(-(n*Log[a + b*x]) + n*Log[c +
 d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^n]))))/(288*b*(b*c - a*d)^4*(a + b*x)
^4)
```

Maple [C] time = 3.333, size = 33370, normalized size = 56.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 2.05568, size = 3021, normalized size = 5.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x, algorithm="maxi
ma")
```

```
[Out] 1/288*B^2*(12*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3
*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4
- 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^
3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 2
5*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n
- 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d +
 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 -
 a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*
b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3
*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e - (9*b^4*c^4*e^2*n^2 - 64*a*b^3*c^3
*d*e^2*n^2 + 216*a^2*b^2*c^2*d^2*e^2*n^2 - 576*a^3*b*c*d^3*e^2*n^2 + 415*a^
4*d^4*e^2*n^2 - 300*(b^4*c*d^3*e^2*n^2 - a*b^3*d^4*e^2*n^2)*x^3 + 6*(13*b^4
*c^2*d^2*e^2*n^2 - 176*a*b^3*c*d^3*e^2*n^2 + 163*a^2*b^2*d^4*e^2*n^2)*x^2 +
 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*
x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a)^2 + 72*(b^4*d^4
*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*
b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(d*x + c)^2 - 4*(7*b^4*c^3*d*e^2*n^2
- 60*a*b^3*c^2*d^2*e^2*n^2 + 324*a^2*b^2*c*d^3*e^2*n^2 - 271*a^3*b*d^4*e^2*
n^2)*x - 300*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4
*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a) + 12*(
25*b^4*d^4*e^2*n^2*x^4 + 100*a*b^3*d^4*e^2*n^2*x^3 + 150*a^2*b^2*d^4*e^2*n^
2*x^2 + 100*a^3*b*d^4*e^2*n^2*x + 25*a^4*d^4*e^2*n^2 - 12*(b^4*d^4*e^2*n^2*
x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2
*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a))*log(d*x + c))/((a^4*b^5*c^4 - 4*a^5
*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4
*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(
a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4
*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^
4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c
^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)*e^2)) - 1/4*B^2*log((b*x + a)^n*
e/(d*x + c)^n)^2/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4
*b) + 1/24*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^
2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4
*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d
```

```
^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a
^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5
*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*
a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^
3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4
*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^
3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*
x))*A*B/e - 1/2*A*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^5*x^4 + 4*a*b^4*x^3 +
 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) - 1/4*A^2/(b^5*x^4 + 4*a*b^4*x^3 + 6*
a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b)
```

Fricas [B] time = 1.69859, size = 5029, normalized size = 8.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x, algorithm="fric
as")
```

```
[Out] -1/288*(72*A^2*b^4*c^4 - 288*A^2*a*b^3*c^3*d + 432*A^2*a^2*b^2*c^2*d^2 - 28
8*A^2*a^3*b*c*d^3 + 72*A^2*a^4*d^4 - 12*(25*(B^2*b^4*c*d^3 - B^2*a*b^3*d^4)
*n^2 + 12*(A*B*b^4*c*d^3 - A*B*a*b^3*d^4)*n)*x^3 + (9*B^2*b^4*c^4 - 64*B^2*
a*b^3*c^3*d + 216*B^2*a^2*b^2*c^2*d^2 - 576*B^2*a^3*b*c*d^3 + 415*B^2*a^4*d
^4)*n^2 + 6*((13*B^2*b^4*c^2*d^2 - 176*B^2*a*b^3*c*d^3 + 163*B^2*a^2*b^2*d^
4)*n^2 + 12*(A*B*b^4*c^2*d^2 - 8*A*B*a*b^3*c*d^3 + 7*A*B*a^2*b^2*d^4)*n)*x^
2 - 72*(B^2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n
^2*x^2 + 4*B^2*a^3*b*d^4*n^2*x - (B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a
^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n^2)*log(b*x + a)^2 - 72*(B^2*b^4*d^4*n
^2*x^4 + 4*B^2*a*b^3*d^4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n^2*x^2 + 4*B^2*a^3*b*
d^4*n^2*x - (B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^
2*a^3*b*c*d^3)*n^2)*log(d*x + c)^2 + 72*(B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d +
6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3 + B^2*a^4*d^4)*log(e)^2 + 12*(3*A
*B*b^4*c^4 - 16*A*B*a*b^3*c^3*d + 36*A*B*a^2*b^2*c^2*d^2 - 48*A*B*a^3*b*c*d
^3 + 25*A*B*a^4*d^4)*n - 4*((7*B^2*b^4*c^3*d - 60*B^2*a*b^3*c^2*d^2 + 324*B
^2*a^2*b^2*c*d^3 - 271*B^2*a^3*b*d^4)*n^2 + 12*(A*B*b^4*c^3*d - 6*A*B*a*b^3
*c^2*d^2 + 18*A*B*a^2*b^2*c*d^3 - 13*A*B*a^3*b*d^4)*n)*x - 12*((25*B^2*b^4*
d^4*n^2 + 12*A*B*b^4*d^4*n)*x^4 + 4*(12*A*B*a*b^3*d^4*n + (3*B^2*b^4*c*d^3
+ 22*B^2*a*b^3*d^4)*n^2)*x^3 - (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2
*a^2*b^2*c^2*d^2 - 48*B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B*a^2*b^2*d^4*n - (B^2
*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 18*B^2*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B*b
^4*c^4 - 4*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^2*d^2 - 4*A*B*a^3*b*c*d^3)*n +
```

```
 4*(12*A*B*a^3*b*d^4*n + (B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*
b^2*c*d^3 + 12*B^2*a^3*b*d^4)*n^2)*x + 12*(B^2*b^4*d^4*n*x^4 + 4*B^2*a*b^3*
d^4*n*x^3 + 6*B^2*a^2*b^2*d^4*n*x^2 + 4*B^2*a^3*b*d^4*n*x - (B^2*b^4*c^4 -
4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n)*log(e))*l
og(b*x + a) + 12*((25*B^2*b^4*d^4*n^2 + 12*A*B*b^4*d^4*n)*x^4 + 4*(12*A*B*a
*b^3*d^4*n + (3*B^2*b^4*c*d^3 + 22*B^2*a*b^3*d^4)*n^2)*x^3 - (3*B^2*b^4*c^4
 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b^2*c^2*d^2 - 48*B^2*a^3*b*c*d^3)*n^2 +
6*(12*A*B*a^2*b^2*d^4*n - (B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 - 18*B^2*a^2
*b^2*d^4)*n^2)*x^2 - 12*(A*B*b^4*c^4 - 4*A*B*a*b^3*c^3*d + 6*A*B*a^2*b^2*c^
2*d^2 - 4*A*B*a^3*b*c*d^3)*n + 4*(12*A*B*a^3*b*d^4*n + (B^2*b^4*c^3*d - 6*B
^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 + 12*B^2*a^3*b*d^4)*n^2)*x + 12*(B^
2*b^4*d^4*n^2*x^4 + 4*B^2*a*b^3*d^4*n^2*x^3 + 6*B^2*a^2*b^2*d^4*n^2*x^2 + 4
*B^2*a^3*b*d^4*n^2*x - (B^2*b^4*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2
*d^2 - 4*B^2*a^3*b*c*d^3)*n^2)*log(b*x + a) + 12*(B^2*b^4*d^4*n*x^4 + 4*B^2
*a*b^3*d^4*n*x^3 + 6*B^2*a^2*b^2*d^4*n*x^2 + 4*B^2*a^3*b*d^4*n*x - (B^2*b^4
*c^4 - 4*B^2*a*b^3*c^3*d + 6*B^2*a^2*b^2*c^2*d^2 - 4*B^2*a^3*b*c*d^3)*n)*lo
g(e))*log(d*x + c) + 12*(12*A*B*b^4*c^4 - 48*A*B*a*b^3*c^3*d + 72*A*B*a^2*b
^2*c^2*d^2 - 48*A*B*a^3*b*c*d^3 + 12*A*B*a^4*d^4 - 12*(B^2*b^4*c*d^3 - B^2*
a*b^3*d^4)*n*x^3 + 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + 7*B^2*a^2*b^2*d
^4)*n*x^2 - 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 -
 13*B^2*a^3*b*d^4)*n*x + (3*B^2*b^4*c^4 - 16*B^2*a*b^3*c^3*d + 36*B^2*a^2*b
^2*c^2*d^2 - 48*B^2*a^3*b*c*d^3 + 25*B^2*a^4*d^4)*n)*log(e))/(a^4*b^5*c^4 -
 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c
^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4
 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a
^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*
a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5
*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(b*x+a)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(bx+a)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(b*x+a)^5,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(b*x + a)^5, x)
```

3.164 $\int (a+bx)^3 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$

Optimal. Leaf size=809

$$-\frac{3Bn\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2(bc-ad)^4}{4bd^4}-\frac{B^3n^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{4bd^4}+\frac{3B^3n^3\log(c+dx)(bc-}{2bd^4}$$

```
[Out] -(B^3*(b*c - a*d)^3*n^3*x)/(4*d^3) - (B^3*(b*c - a*d)^4*n^3*Log[(a + b*x)/(
c + d*x)])/(4*b*d^4) + (3*B^3*(b*c - a*d)^4*n^3*Log[c + d*x])/(2*b*d^4) - (
7*B^2*(b*c - a*d)^3*n^2*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))
/(4*b*d^3) + (b*B^2*(b*c - a*d)^2*n^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n]))/(4*d^4) - (9*B^2*(b*c - a*d)^4*n^2*Log[(b*c - a*d)/(b*(c +
 d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*b*d^4) - (9*B*(b*c - a
*d)^3*n*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(4*b*d^3) + (
9*b*B*(b*c - a*d)^2*n*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^
2)/(8*d^4) - (b^2*B*(b*c - a*d)*n*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])^2)/(4*d^4) - (3*B*(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x))
]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(4*b*d^4) + ((a + b*x)^4*(A +
 B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(4*b) + (7*B^2*(b*c - a*d)^4*n^2*(A
 + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - (b*(c + d*x))/(d*(a + b*x))]
)/(4*b*d^4) - (9*B^3*(b*c - a*d)^4*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x
))])/(2*b*d^4) - (3*B^2*(b*c - a*d)^4*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d
*x)^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b*d^4) - (7*B^3*(b*c -
a*d)^4*n^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(4*b*d^4) + (3*B^3*(b*c
 - a*d)^4*n^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(2*b*d^4)
```

Rubi [A] time = 2.40354, antiderivative size = 1203, normalized size of antiderivative = 1.49, number of steps used = 56, number of rules used = 13, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.394, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$-\frac{3B^3n\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)(bc-ad)^4}{4bd^4}+\frac{3B^3n^3\log(c+dx)(bc-ad)^4}{2bd^4}+\frac{11AB^2n^2\log(c+dx)(bc-a}{4bd^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (-3*A^2*B*(b*c - a*d)^3*n*x)/(4*d^3) - (5*A*B^2*(b*c - a*d)^3*n^2*x)/(4*d^3
) - (B^3*(b*c - a*d)^3*n^3*x)/(4*d^3) + (3*A^2*B*(b*c - a*d)^2*n*(a + b*x)^
2)/(8*b*d^2) + (A*B^2*(b*c - a*d)^2*n^2*(a + b*x)^2)/(4*b*d^2) - (A^2*B*(b*
```

```
c - a*d)*n*(a + b*x)^3)/(4*b*d) + (A^3*(a + b*x)^4)/(4*b) + (3*A^2*B*(b*c -
 a*d)^4*n*Log[c + d*x])/(4*b*d^4) + (11*A*B^2*(b*c - a*d)^4*n^2*Log[c + d*x
])/(4*b*d^4) + (3*B^3*(b*c - a*d)^4*n^3*Log[c + d*x])/(2*b*d^4) - (3*A*B^2*
(b*c - a*d)^3*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*d^3) - (5*
B^3*(b*c - a*d)^3*n^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*d^3)
 + (3*A*B^2*(b*c - a*d)^2*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(
4*b*d^2) + (B^3*(b*c - a*d)^2*n^2*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(4*b*d^2) - (A*B^2*(b*c - a*d)*n*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/(2*b*d) + (3*A^2*B*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(
4*b) - (3*A*B^2*(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a +
b*x)^n)/(c + d*x)^n])/(2*b*d^4) - (11*B^3*(b*c - a*d)^4*n^2*Log[(b*c - a*d)
/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*d^4) - (3*B^3*(b*c -
 a*d)^3*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*d^3) + (3*B^3*
(b*c - a*d)^2*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(8*b*d^2) -
 (B^3*(b*c - a*d)*n*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*d)
 + (3*A*B^2*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b) - (3*B^3*
(b*c - a*d)^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x
)^n]^2)/(4*b*d^4) + (B^3*(a + b*x)^4*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(4
*b) - (3*A*B^2*(b*c - a*d)^4*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(
2*b*d^4) - (11*B^3*(b*c - a*d)^4*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
])/(4*b*d^4) - (3*B^3*(b*c - a*d)^4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Po
lyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*d^4) + (3*B^3*(b*c - a*d)^4*n
^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*d^4)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (a+bx)^3 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx = \int \left(A^3(a+bx)^3 + 3A^2B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right) + 3AB\right.$$

$$= \frac{A^3(a+bx)^4}{4b} + \left(3A^2B\right)\int (a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)\, dx +$$

$$= \frac{A^3(a+bx)^4}{4b} + \frac{3A^2B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b} + \frac{3AB^2(}{}$$

$$= \frac{A^3(a+bx)^4}{4b} + \frac{3A^2B(a+bx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4b} + \frac{3AB^2(}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+bx)^2}{8bd^2} - \frac{A^2B(bc-ad)}{4bd}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+bx)^2}{8bd^2} - \frac{A^2B(bc-ad)}{4bd}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+bx)^2}{8bd^2} - \frac{A^2B(bc-ad)}{4bd}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+}{8bd^2}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+}{8bd^2}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} + \frac{3A^2B(bc-ad)^2n(a+}{8bd^2}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} - \frac{B^3(bc-ad)^3n^3x}{4d^3} + \frac{3}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} - \frac{B^3(bc-ad)^3n^3x}{4d^3} + \frac{3}{}$$

$$= -\frac{3A^2B(bc-ad)^3nx}{4d^3} - \frac{5AB^2(bc-ad)^3n^2x}{4d^3} - \frac{B^3(bc-ad)^3n^3x}{4d^3} + \frac{3}{}$$

Mathematica [B] time = 9.69639, size = 9054, normalized size = 11.19

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 5.133, size = 0, normalized size = 0.

$$\int (bx+a)^3 \left(A + B\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((b*x+a)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxi
ma")
```

```
[Out] 3/4*A^2*B*b^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A^3*b^3*x^4 + 3*A^2*
B*a*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + A^3*a*b^2*x^3 + 9/2*A^2*B*a^2*
b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 3/2*A^3*a^2*b*x^2 + 3*A^2*B*a^3*x*lo
g((b*x + a)^n*e/(d*x + c)^n) + A^3*a^3*x + 3*(a*e*n*log(b*x + a)/b - c*e*n*
log(d*x + c)/d)*A^2*B*a^3/e - 9/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d
*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*a^2*b/e + 3/2*(2*a^3*e*n*l
og(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)
*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A^2*B*a*b^2/e - 1/8*(6*a
^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*(b^3*c*d^2*e*n -
```

a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n
 - a^3*d^3*e*n)*x)/(b^3*d^3))*A^2*B*b^3/e - 1/8*(2*(B^3*b^4*d^4*x^4 + 4*B^3
*a*b^3*d^4*x^3 + 6*B^3*a^2*b^2*d^4*x^2 + 4*B^3*a^3*b*d^4*x)*log((d*x + c)^n
)^3 - (6*B^3*a^4*d^4*n*log(b*x + a) + 6*(B^3*b^4*d^4*log(e) + A*B^2*b^4*d^4
)*x^4 + 6*(b^4*c^4*n - 4*a*b^3*c^3*d*n + 6*a^2*b^2*c^2*d^2*n - 4*a^3*b*c*d^
3*n)*B^3*log(d*x + c) + 2*(12*A*B^2*a*b^3*d^4 + (a*b^3*d^4*(n + 12*log(e))
- b^4*c*d^3*n)*B^3)*x^3 + 3*(12*A*B^2*a^2*b^2*d^4 + (3*a^2*b^2*d^4*(n + 4*l
og(e)) + b^4*c^2*d^2*n - 4*a*b^3*c*d^3*n)*B^3)*x^2 + 6*(4*A*B^2*a^3*b*d^4 +
 (a^3*b*d^4*(3*n + 4*log(e)) - b^4*c^3*d*n + 4*a*b^3*c^2*d^2*n - 6*a^2*b^2*
c*d^3*n)*B^3)*x + 6*(B^3*b^4*d^4*x^4 + 4*B^3*a*b^3*d^4*x^3 + 6*B^3*a^2*b^2*
d^4*x^2 + 4*B^3*a^3*b*d^4*x)*log((b*x + a)^n))*log((d*x + c)^n)^2)/(b*d^4)
- integrate(-1/4*(4*B^3*a^3*b*c*d^3*log(e)^3 + 12*A*B^2*a^3*b*c*d^3*log(e)^
2 + 4*(B^3*b^4*d^4*log(e)^3 + 3*A*B^2*b^4*d^4*log(e)^2)*x^4 + 4*(3*(b^4*c*d
^3*log(e)^2 + 3*a*b^3*d^4*log(e)^2)*A*B^2 + (b^4*c*d^3*log(e)^3 + 3*a*b^3*d
^4*log(e)^3)*B^3)*x^3 + 4*(B^3*b^4*d^4*x^4 + B^3*a^3*b*c*d^3 + (b^4*c*d^3 +
 3*a*b^3*d^4)*B^3*x^3 + 3*(a*b^3*c*d^3 + a^2*b^2*d^4)*B^3*x^2 + (3*a^2*b^2*
c*d^3 + a^3*b*d^4)*B^3*x)*log((b*x + a)^n)^3 + 12*(3*(a*b^3*c*d^3*log(e)^2
+ a^2*b^2*d^4*log(e)^2)*A*B^2 + (a*b^3*c*d^3*log(e)^3 + a^2*b^2*d^4*log(e)^
3)*B^3)*x^2 + 12*(B^3*a^3*b*c*d^3*log(e) + A*B^2*a^3*b*c*d^3 + (B^3*b^4*d^4
*log(e) + A*B^2*b^4*d^4)*x^4 + ((b^4*c*d^3 + 3*a*b^3*d^4)*A*B^2 + (b^4*c*d^
3*log(e) + 3*a*b^3*d^4*log(e))*B^3)*x^3 + 3*((a*b^3*c*d^3 + a^2*b^2*d^4)*A*
B^2 + (a*b^3*c*d^3*log(e) + a^2*b^2*d^4*log(e))*B^3)*x^2 + ((3*a^2*b^2*c*d^
3 + a^3*b*d^4)*A*B^2 + (3*a^2*b^2*c*d^3*log(e) + a^3*b*d^4*log(e))*B^3)*x)*
log((b*x + a)^n)^2 + 4*(3*(3*a^2*b^2*c*d^3*log(e)^2 + a^3*b*d^4*log(e)^2)*A
*B^2 + (3*a^2*b^2*c*d^3*log(e)^3 + a^3*b*d^4*log(e)^3)*B^3)*x + 12*(B^3*a^3
*b*c*d^3*log(e)^2 + 2*A*B^2*a^3*b*c*d^3*log(e) + (B^3*b^4*d^4*log(e)^2 + 2*
A*B^2*b^4*d^4*log(e))*x^4 + (2*(b^4*c*d^3*log(e) + 3*a*b^3*d^4*log(e))*A*B^
2 + (b^4*c*d^3*log(e)^2 + 3*a*b^3*d^4*log(e)^2)*B^3)*x^3 + 3*(2*(a*b^3*c*d^
3*log(e) + a^2*b^2*d^4*log(e))*A*B^2 + (a*b^3*c*d^3*log(e)^2 + a^2*b^2*d^4*
log(e)^2)*B^3)*x^2 + (2*(3*a^2*b^2*c*d^3*log(e) + a^3*b*d^4*log(e))*A*B^2 +
 (3*a^2*b^2*c*d^3*log(e)^2 + a^3*b*d^4*log(e)^2)*B^3)*x)*log((b*x + a)^n) -
 (6*B^3*a^4*d^4*n^2*log(b*x + a) + 12*B^3*a^3*b*c*d^3*log(e)^2 + 24*A*B^2*a
^3*b*c*d^3*log(e) + 6*((n*log(e) + 2*log(e)^2)*B^3*b^4*d^4 + A*B^2*b^4*d^4*
(n + 4*log(e)))*x^4 + 6*(b^4*c^4*n^2 - 4*a*b^3*c^3*d*n^2 + 6*a^2*b^2*c^2*d^
2*n^2 - 4*a^3*b*c*d^3*n^2)*B^3*log(d*x + c) + 2*(12*(a*b^3*d^4*(n + 3*log(e
)) + b^4*c*d^3*log(e))*A*B^2 - ((n^2 - 6*log(e)^2)*b^4*c*d^3 - (n^2 + 12*n*
log(e) + 18*log(e)^2)*a*b^3*d^4)*B^3)*x^3 + 3*(12*(a^2*b^2*d^4*(n + 2*log(e
)) + 2*a*b^3*c*d^3*log(e))*A*B^2 + (b^4*c^2*d^2*n^2 - 4*(n^2 - 3*log(e)^2)*
a*b^3*c*d^3 + 3*(n^2 + 4*n*log(e) + 4*log(e)^2)*a^2*b^2*d^4)*B^3)*x^2 + 12*
(B^3*b^4*d^4*x^4 + B^3*a^3*b*c*d^3 + (b^4*c*d^3 + 3*a*b^3*d^4)*B^3*x^3 + 3*
(a*b^3*c*d^3 + a^2*b^2*d^4)*B^3*x^2 + (3*a^2*b^2*c*d^3 + a^3*b*d^4)*B^3*x)*
log((b*x + a)^n)^2 + 6*(4*(a^3*b*d^4*(n + log(e)) + 3*a^2*b^2*c*d^3*log(e))
*A*B^2 - (b^4*c^3*d*n^2 - 4*a*b^3*c^2*d^2*n^2 + 6*(n^2 - log(e)^2)*a^2*b^2*
c*d^3 - (3*n^2 + 4*n*log(e) + 2*log(e)^2)*a^3*b*d^4)*B^3)*x + 6*(4*B^3*a^3*
b*c*d^3*log(e) + 4*A*B^2*a^3*b*c*d^3 + (B^3*b^4*d^4*(n + 4*log(e)) + 4*A*B^

```
2*b^4*d^4)*x^4 + 4*((b^4*c*d^3 + 3*a*b^3*d^4)*A*B^2 + (a*b^3*d^4*(n + 3*log
(e)) + b^4*c*d^3*log(e))*B^3)*x^3 + 6*(2*(a*b^3*c*d^3 + a^2*b^2*d^4)*A*B^2
+ (a^2*b^2*d^4*(n + 2*log(e)) + 2*a*b^3*c*d^3*log(e))*B^3)*x^2 + 4*((3*a^2*
b^2*c*d^3 + a^3*b*d^4)*A*B^2 + (a^3*b*d^4*(n + log(e)) + 3*a^2*b^2*c*d^3*lo
g(e))*B^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^4*x + b*c*d^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^3b^3x^3 + 3\,A^3ab^2x^2 + 3\,A^3a^2bx + A^3a^3 + \left(B^3b^3x^3 + 3\,B^3ab^2x^2 + 3\,B^3a^2bx + B^3a^3\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\left(AB^2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fric
as")
```

```
[Out] integral(A^3*b^3*x^3 + 3*A^3*a*b^2*x^2 + 3*A^3*a^2*b*x + A^3*a^3 + (B^3*b^3
*x^3 + 3*B^3*a*b^2*x^2 + 3*B^3*a^2*b*x + B^3*a^3)*log((b*x + a)^n*e/(d*x +
c)^n)^3 + 3*(A*B^2*b^3*x^3 + 3*A*B^2*a*b^2*x^2 + 3*A*B^2*a^2*b*x + A*B^2*a^
3)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*b^3*x^3 + 3*A^2*B*a*b^2*x^2
+ 3*A^2*B*a^2*b*x + A^2*B*a^3)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^3\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^3*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

3.165 $\int (a+bx)^2 \left(A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx$

Optimal. Leaf size=614

$$\frac{2B^2n^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bd^3}+\frac{4B^3n^3(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^3}+\frac{B^3n^3(b$$

```
[Out] -((B^3*(b*c - a*d)^3*n^3*Log[c + d*x])/(b*d^3)) + (B^2*(b*c - a*d)^2*n^2*(a
 + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b*d^2) + (4*B^2*(b*c - a
*d)^3*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*
x)^n]))/(b*d^3) + (2*B*(b*c - a*d)^2*n*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^2)/(b*d^2) - (b*B*(b*c - a*d)*n*(c + d*x)^2*(A + B*Log[(e*(a
 + b*x)^n)/(c + d*x)^n])^2)/(2*d^3) + (B*(b*c - a*d)^3*n*Log[(b*c - a*d)/(b
*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(b*d^3) + ((a + b*
x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(3*b) - (B^2*(b*c - a*d)^3
*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - (b*(c + d*x))/(d*(a +
 b*x))])/(b*d^3) + (4*B^3*(b*c - a*d)^3*n^3*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))])/(b*d^3) + (2*B^2*(b*c - a*d)^3*n^2*(A + B*Log[(e*(a + b*x)^n)/(c
+ d*x)^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^3) + (B^3*(b*c - a
*d)^3*n^3*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))])/(b*d^3) - (2*B^3*(b*c -
a*d)^3*n^3*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/(b*d^3)
```

Rubi [A] time = 1.7369, antiderivative size = 915, normalized size of antiderivative = 1.49, number of steps used = 40, number of rules used = 13, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.394, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{(a+bx)^3\log^3\left(e(a+bx)^n(c+dx)^{-n}\right)B^3}{3b}-\frac{(bc-ad)n(a+bx)^2\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)B^3}{2bd}+\frac{(bc-ad)^2n(a+bx)\log^2\left(\right.}{bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (A^2*B*(b*c - a*d)^2*n*x)/d^2 + (A*B^2*(b*c - a*d)^2*n^2*x)/d^2 - (A^2*B*(b
*c - a*d)*n*(a + b*x)^2)/(2*b*d) + (A^3*(a + b*x)^3)/(3*b) - (A^2*B*(b*c -
a*d)^3*n*Log[c + d*x])/(b*d^3) - (3*A*B^2*(b*c - a*d)^3*n^2*Log[c + d*x])/(
b*d^3) - (B^3*(b*c - a*d)^3*n^3*Log[c + d*x])/(b*d^3) + (2*A*B^2*(b*c - a*d
)^2*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) + (B^3*(b*c - a*d
)^2*n^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) - (A*B^2*(b*c -
 a*d)*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (A^2*B*(a + b
```

```
*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/b + (2*A*B^2*(b*c - a*d)^3*n*Log[(b
*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^3) + (3*B^3
*(b*c - a*d)^3*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/(b*d^3) + (B^3*(b*c - a*d)^2*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2)/(b*d^2) - (B^3*(b*c - a*d)*n*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2)/(2*b*d) + (A*B^2*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
2)/b + (B^3*(b*c - a*d)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^2)/(b*d^3) + (B^3*(a + b*x)^3*Log[(e*(a + b*x)^n)/(c + d*x
)^n]^3)/(3*b) + (2*A*B^2*(b*c - a*d)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c +
 d*x))])/(b*d^3) + (3*B^3*(b*c - a*d)^3*n^3*PolyLog[2, (d*(a + b*x))/(b*(c
+ d*x))])/(b*d^3) + (2*B^3*(b*c - a*d)^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^
n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d^3) - (2*B^3*(b*c - a*d)^
3*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d^3)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (a+bx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx = \int \Big(A^3(a+bx)^2 + 3A^2B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right) + 3AB^2 \cdots$$

$$= \frac{A^3(a+bx)^3}{3b} + \left(3A^2B\right)\int (a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\, dx + \Big(\cdots$$

$$= \frac{A^3(a+bx)^3}{3b} + \frac{A^2B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{AB^2(a+ \cdots}{\cdots}$$

$$= \frac{A^3(a+bx)^3}{3b} + \frac{A^2B(a+bx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b} + \frac{AB^2(a+ \cdots}{\cdots}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \frac{A^3(a+bx)^3}{3b} - \frac{A^2B(\cdots}{\cdots}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \frac{A^3(a+bx)^3}{3b} - \frac{A^2B(\cdots}{\cdots}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \frac{A^3(a+bx)^3}{3b} - \frac{A^2B(\cdots}{\cdots}$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \cdots$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \cdots$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \cdots$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \cdots$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \cdots$$

$$= \frac{A^2B(bc-ad)^2nx}{d^2} + \frac{AB^2(bc-ad)^2n^2x}{d^2} - \frac{A^2B(bc-ad)n(a+bx)^2}{2bd} + \cdots$$

Mathematica [B] time = 4.11063, size = 5668, normalized size = 9.23

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 4.456, size = 0, normalized size = 0.

$$\int (bx+a)^2 \left(A + B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((b*x+a)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxi
ma")
```

```
[Out] A^2*B*b^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^3*b^2*x^3 + 3*A^2*B*a*
b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^3*a*b*x^2 + 3*A^2*B*a^2*x*log((b*x
 + a)^n*e/(d*x + c)^n) + A^3*a^2*x + 3*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A^2*B*a^2/e - 3*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/
d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*a*b/e + 1/2*(2*a^3*e*n*log(b*x + a
)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(
b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A^2*B*b^2/e - 1/6*(2*(B^3*b^3*d^3*
x^3 + 3*B^3*a*b^2*d^3*x^2 + 3*B^3*a^2*b*d^3*x)*log((d*x + c)^n)^3 - 3*(2*B^
3*a^3*d^3*n*log(b*x + a) - 2*(b^3*c^3*n - 3*a*b^2*c^2*d*n + 3*a^2*b*c*d^2*n
```

```
)*B^3*log(d*x + c) + 2*(B^3*b^3*d^3*log(e) + A*B^2*b^3*d^3)*x^3 + (6*A*B^2*
a*b^2*d^3 + (a*b^2*d^3*(n + 6*log(e)) - b^3*c*d^2*n)*B^3)*x^2 + 2*(3*A*B^2*
a^2*b*d^3 + (a^2*b*d^3*(2*n + 3*log(e)) + b^3*c^2*d*n - 3*a*b^2*c*d^2*n)*B^
3)*x + 2*(B^3*b^3*d^3*x^3 + 3*B^3*a*b^2*d^3*x^2 + 3*B^3*a^2*b*d^3*x)*log((b
*x + a)^n))*log((d*x + c)^n)^2)/(b*d^3) - integrate(-(B^3*a^2*b*c*d^2*log(e
)^3 + 3*A*B^2*a^2*b*c*d^2*log(e)^2 + (B^3*b^3*d^3*log(e)^3 + 3*A*B^2*b^3*d^
3*log(e)^2)*x^3 + (B^3*b^3*d^3*x^3 + B^3*a^2*b*c*d^2 + (b^3*c*d^2 + 2*a*b^2
*d^3)*B^3*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*B^3*x)*log((b*x + a)^n)^3 + (3*
(b^3*c*d^2*log(e)^2 + 2*a*b^2*d^3*log(e)^2)*A*B^2 + (b^3*c*d^2*log(e)^3 + 2
*a*b^2*d^3*log(e)^3)*B^3)*x^2 + 3*(B^3*a^2*b*c*d^2*log(e) + A*B^2*a^2*b*c*d
^2 + (B^3*b^3*d^3*log(e) + A*B^2*b^3*d^3)*x^3 + ((b^3*c*d^2 + 2*a*b^2*d^3)*
A*B^2 + (b^3*c*d^2*log(e) + 2*a*b^2*d^3*log(e))*B^3)*x^2 + ((2*a*b^2*c*d^2
+ a^2*b*d^3)*A*B^2 + (2*a*b^2*c*d^2*log(e) + a^2*b*d^3*log(e))*B^3)*x)*log(
(b*x + a)^n)^2 + (3*(2*a*b^2*c*d^2*log(e)^2 + a^2*b*d^3*log(e)^2)*A*B^2 + (
2*a*b^2*c*d^2*log(e)^3 + a^2*b*d^3*log(e)^3)*B^3)*x + 3*(B^3*a^2*b*c*d^2*lo
g(e)^2 + 2*A*B^2*a^2*b*c*d^2*log(e) + (B^3*b^3*d^3*log(e)^2 + 2*A*B^2*b^3*d
^3*log(e))*x^3 + (2*(b^3*c*d^2*log(e) + 2*a*b^2*d^3*log(e))*A*B^2 + (b^3*c*
d^2*log(e)^2 + 2*a*b^2*d^3*log(e)^2)*B^3)*x^2 + (2*(2*a*b^2*c*d^2*log(e) +
a^2*b*d^3*log(e))*A*B^2 + (2*a*b^2*c*d^2*log(e)^2 + a^2*b*d^3*log(e)^2)*B^3
)*x)*log((b*x + a)^n) - (2*B^3*a^3*d^3*n^2*log(b*x + a) + 3*B^3*a^2*b*c*d^2
*log(e)^2 + 6*A*B^2*a^2*b*c*d^2*log(e) - 2*(b^3*c^3*n^2 - 3*a*b^2*c^2*d*n^2
 + 3*a^2*b*c*d^2*n^2)*B^3*log(d*x + c) + ((2*n*log(e) + 3*log(e)^2)*B^3*b^3
*d^3 + 2*A*B^2*b^3*d^3*(n + 3*log(e)))*x^3 + (6*(a*b^2*d^3*(n + 2*log(e)) +
 b^3*c*d^2*log(e))*A*B^2 - ((n^2 - 3*log(e)^2)*b^3*c*d^2 - (n^2 + 6*n*log(e
) + 6*log(e)^2)*a*b^2*d^3)*B^3)*x^2 + 3*(B^3*b^3*d^3*x^3 + B^3*a^2*b*c*d^2
+ (b^3*c*d^2 + 2*a*b^2*d^3)*B^3*x^2 + (2*a*b^2*c*d^2 + a^2*b*d^3)*B^3*x)*lo
g((b*x + a)^n)^2 + (6*(a^2*b*d^3*(n + log(e)) + 2*a*b^2*c*d^2*log(e))*A*B^2
 + (2*b^3*c^2*d*n^2 - 6*(n^2 - log(e)^2)*a*b^2*c*d^2 + (4*n^2 + 6*n*log(e)
+ 3*log(e)^2)*a^2*b*d^3)*B^3)*x + 2*(3*B^3*a^2*b*c*d^2*log(e) + 3*A*B^2*a^2
*b*c*d^2 + (B^3*b^3*d^3*(n + 3*log(e)) + 3*A*B^2*b^3*d^3)*x^3 + 3*((b^3*c*d
^2 + 2*a*b^2*d^3)*A*B^2 + (a*b^2*d^3*(n + 2*log(e)) + b^3*c*d^2*log(e))*B^3
)*x^2 + 3*((2*a*b^2*c*d^2 + a^2*b*d^3)*A*B^2 + (a^2*b*d^3*(n + log(e)) + 2*
a*b^2*c*d^2*log(e))*B^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^3*x +
b*c*d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^3b^2x^2 + 2\,A^3abx + A^3a^2 + \left(B^3b^2x^2 + 2\,B^3abx + B^3a^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\left(AB^2b^2x^2 + 2\,AB^2abx + AB^2a^2\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fric
```

```
as")
```

```
[Out] integral(A^3*b^2*x^2 + 2*A^3*a*b*x + A^3*a^2 + (B^3*b^2*x^2 + 2*B^3*a*b*x +
 B^3*a^2)*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*(A*B^2*b^2*x^2 + 2*A*B^2*a*b
*x + A*B^2*a^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*b^2*x^2 + 2*A^2
*B*a*b*x + A^2*B*a^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^2 \left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac
")
```

```
[Out] integrate((b*x + a)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

3.166 $\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$

Optimal. Leaf size=376

$$-\frac{3B^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{bd^2}-\frac{3B^3n^3(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}+\frac{3B^3n}{}$$

```
[Out] (-3*B^2*(b*c - a*d)^2*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n]))/(b*d^2) - (3*B*(b*c - a*d)*n*(a + b*x)*(A + B*Log[(
e*(a + b*x)^n)/(c + d*x)^n])^2)/(2*b*d) - (3*B*(b*c - a*d)^2*n*Log[(b*c - a
*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(2*b*d^2) +
((a + b*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(2*b) - (3*B^3*(b*
c - a*d)^2*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) - (3*B^2*(b
*c - a*d)^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[2, (d*(a +
 b*x))/(b*(c + d*x))])/(b*d^2) + (3*B^3*(b*c - a*d)^2*n^3*PolyLog[3, (d*(a
+ b*x))/(b*(c + d*x))])/(b*d^2)
```

Rubi [A] time = 1.1825, antiderivative size = 700, normalized size of antiderivative = 1.86, number of steps used = 27, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {6742, 2492, 43, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$-\frac{3AB^2n^2(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}-\frac{3B^3n^2(bc-ad)^2\text{PolyLog}\left(2,1-\frac{bc-ad}{b(c+dx)}\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{bd^2}-\frac{3B^3n^3(b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (-3*A^2*B*(b*c - a*d)*n*x)/(2*d) + (A^3*(a + b*x)^2)/(2*b) + (3*A^2*B*(b*c
- a*d)^2*n*Log[c + d*x])/(2*b*d^2) + (3*A*B^2*(b*c - a*d)^2*n^2*Log[c + d*x
])/(b*d^2) - (3*A*B^2*(b*c - a*d)*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)
^n])/(b*d) + (3*A^2*B*(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b) -
 (3*A*B^2*(b*c - a*d)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n
)/(c + d*x)^n])/(b*d^2) - (3*B^3*(b*c - a*d)^2*n^2*Log[(b*c - a*d)/(b*(c +
d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^2) - (3*B^3*(b*c - a*d)*n*(a
+ b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b*d) + (3*A*B^2*(a + b*x)^2*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b) - (3*B^3*(b*c - a*d)^2*n*Log[(b*c
- a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b*d^2) + (B^3*
(a + b*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(2*b) - (3*A*B^2*(b*c - a*d
)^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) - (3*B^3*(b*c - a*
```

```
d)^2*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) - (3*B^3*(b*c - a
*d)^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c
 + d*x))])/(b*d^2) + (3*B^3*(b*c - a*d)^2*n^3*PolyLog[3, 1 - (b*c - a*d)/(b
*(c + d*x))])/(b*d^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
```

```
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (a+bx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx=\int\left(A^3(a+bx)+3A^2B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+3AB^2(a\right.$$

$$=\frac{A^3(a+bx)^2}{2b}+\left(3A^2B\right)\int(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx+\Big($$

$$=\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b}+\frac{3AB^2(a}{}$$

$$=\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(a+bx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2b}+\frac{3AB^2(a}{}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

$$=-\frac{3A^2B(bc-ad)nx}{2d}+\frac{A^3(a+bx)^2}{2b}+\frac{3A^2B(bc-ad)^2n\log(c+dx)}{2bd^2}$$

Mathematica [B] time = 2.97117, size = 3813, normalized size = 10.14

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (4*a^2*B^3*d^2*n^3*Log[a + b*x]^3 - 6*a^2*B^2*d^2*n^2*Log[a + b*x]^2*(2*A -
 B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 6*a^2*B
*d^2*n*Log[a + b*x]*(2*A^2 - 2*A*B*n + B^2*n^2 + 2*B^2*n^2*Log[c + d*x]^2 -
 2*B*(-2*A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^2 + 2*B*n*Log[c + d*x]*(2*A - B*n + 2*B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])) + b*(4*B^3*c*(b*c - 2*a*d)*n^3*Log[c + d*x]^3 + 6*B^2*d^2*
n^2*x*(2*a + b*x)*Log[c + d*x]^2*(2*A - B*n + 2*B*Log[(e*(a + b*x)^n)/(c +
d*x)^n]) + 6*B*d^2*n*x*(2*a + b*x)*Log[c + d*x]*(2*A^2 - 2*A*B*n + B^2*n^2
- 2*B*(-2*A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(a + b*x
)^n)/(c + d*x)^n]^2) + d^2*x*(2*a + b*x)*(4*A^3 - 6*A^2*B*n + 6*A*B^2*n^2 -
 3*B^3*n^3 + 6*B*(2*A^2 - 2*A*B*n + B^2*n^2)*Log[(e*(a + b*x)^n)/(c + d*x)^
n] - 6*B^2*(-2*A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 4*B^3*Log[(e*(
a + b*x)^n)/(c + d*x)^n]^3)))/(8*b*d^2) - (3*B*n*(-8*a*A*b*B*c*d*n + 16*a^2
*A*B*d^2*n - 8*b^2*B^2*c^2*n^2 + 16*a*b*B^2*c*d*n^2 - 8*a^2*B^2*d^2*n^2 + 4
*A^2*b^2*c*d*x - 8*a*A^2*b*d^2*x + 4*a*A*b*B*d^2*n*x - 2*a*b*B^2*d^2*n^2*x
- 2*A^2*b^2*d^2*x^2 + 2*A*b^2*B*d^2*n*x^2 - b^2*B^2*d^2*n^2*x^2 + 8*a*A*b*B
*c*d*n*Log[a + b*x] - 12*a^2*A*B*d^2*n*Log[a + b*x] + 8*a*b*B^2*c*d*n^2*Log
[a + b*x] - 14*a^2*B^2*d^2*n^2*Log[a + b*x] - 4*a*b*B^2*c*d*n^2*Log[a + b*x
]^2 + 6*a^2*B^2*d^2*n^2*Log[a + b*x]^2 - 4*A^2*b^2*c^2*Log[c + d*x] + 8*a*A
^2*b*c*d*Log[c + d*x] - 8*A*b^2*B*c^2*n*Log[c + d*x] + 8*a*A*b*B*c*d*n*Log[
c + d*x] - 8*a*b*B^2*c*d*n^2*Log[c + d*x] + 16*a^2*B^2*d^2*n^2*Log[c + d*x]
 + 8*a*A^2*b*d^2*x*Log[c + d*x] - 8*a*A*b*B*d^2*n*x*Log[c + d*x] + 4*a*b*B^
2*d^2*n^2*x*Log[c + d*x] + 4*A^2*b^2*d^2*x^2*Log[c + d*x] - 4*A*b^2*B*d^2*n
*x^2*Log[c + d*x] + 2*b^2*B^2*d^2*n^2*x^2*Log[c + d*x] + 8*A*b^2*B*c^2*n*Lo
g[a + b*x]*Log[c + d*x] - 16*a*A*b*B*c*d*n*Log[a + b*x]*Log[c + d*x] + 8*a^
2*A*B*d^2*n*Log[a + b*x]*Log[c + d*x] - 4*b^2*B^2*c^2*n^2*Log[a + b*x]*Log[
c + d*x] + 16*a*b*B^2*c*d*n^2*Log[a + b*x]*Log[c + d*x] - 16*a^2*B^2*d^2*n^
2*Log[a + b*x]*Log[c + d*x] - 4*b^2*B^2*c^2*n^2*Log[a + b*x]^2*Log[c + d*x]
 + 8*a*b*B^2*c*d*n^2*Log[a + b*x]^2*Log[c + d*x] - 4*a^2*B^2*d^2*n^2*Log[a
+ b*x]^2*Log[c + d*x] + 12*b^2*B^2*c^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)
]*Log[c + d*x] - 24*a*b*B^2*c*d*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c
 + d*x] + 12*a^2*B^2*d^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]
 - 4*A*b^2*B*c^2*n*Log[c + d*x]^2 + 8*a*A*b*B*c*d*n*Log[c + d*x]^2 - 4*b^2*
B^2*c^2*n^2*Log[c + d*x]^2 + 4*a*b*B^2*c*d*n^2*Log[c + d*x]^2 + 8*a*A*b*B*d
^2*n*x*Log[c + d*x]^2 - 4*a*b*B^2*d^2*n^2*x*Log[c + d*x]^2 + 4*A*b^2*B*d^2*
n*x^2*Log[c + d*x]^2 - 2*b^2*B^2*d^2*n^2*x^2*Log[c + d*x]^2 + 8*b^2*B^2*c^2
```

*n^2*Log[a + b*x]*Log[c + d*x]^2 - 16*a*b*B^2*c*d*n^2*Log[a + b*x]*Log[c +
d*x]^2 + 8*a^2*B^2*d^2*n^2*Log[a + b*x]*Log[c + d*x]^2 - 4*b^2*B^2*c^2*n^2*
Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 + 8*a*b*B^2*c*d*n^2*Log[(d
*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 - 4*a^2*B^2*d^2*n^2*Log[(d*(a +
b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 - 8*A*b^2*B*c^2*n*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)] + 16*a*A*b*B*c*d*n*Log[a + b*x]*Log[(b*(c + d*x))/(
b*c - a*d)] - 8*a^2*A*B*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] +
 4*b^2*B^2*c^2*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 8*a*b*B^2*
c*d*n^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 4*a^2*B^2*d^2*n^2*Log
[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] + 4*b^2*B^2*c^2*n^2*Log[a + b*x]^2
Log[(b(c + d*x))/(b*c - a*d)] - 8*a*b*B^2*c*d*n^2*Log[a + b*x]^2*Log[(b*(
c + d*x))/(b*c - a*d)] + 4*a^2*B^2*d^2*n^2*Log[a + b*x]^2*Log[(b*(c + d*x))
/(b*c - a*d)] - 8*b^2*B^2*c^2*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c + d*x
))/(b*c - a*d)] + 16*a*b*B^2*c*d*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c +
d*x))/(b*c - a*d)] - 8*a^2*B^2*d^2*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c
+ d*x))/(b*c - a*d)] - 8*a*b*B^2*c*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 1
6*a^2*B^2*d^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*A*b^2*B*c*d*x*Log[(e*(
a + b*x)^n)/(c + d*x)^n] - 16*a*A*b*B*d^2*x*Log[(e*(a + b*x)^n)/(c + d*x)^n
] + 4*a*b*B^2*d^2*n*x*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 4*A*b^2*B*d^2*x^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*b^2*B^2*d^2*n*x^2*Log[(e*(a + b*x)^n)/
(c + d*x)^n] + 8*a*b*B^2*c*d*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n
] - 12*a^2*B^2*d^2*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 8*A*b^
2*B*c^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 16*a*A*b*B*c*d*Log[
c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 8*b^2*B^2*c^2*n*Log[c + d*x]*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a*b*B^2*c*d*n*Log[c + d*x]*Log[(e*(a + b
*x)^n)/(c + d*x)^n] + 16*a*A*b*B*d^2*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n] - 8*a*b*B^2*d^2*n*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 + 8*A*b^2*B*d^2*x^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 4*b^2*
B^2*d^2*n*x^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*b^2*B^2*c^2
*n*Log[a + b*x]*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 16*a*b*B^2*
c*d*n*Log[a + b*x]*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a^2*B^
2*d^2*n*Log[a + b*x]*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 4*b^2*
B^2*c^2*n*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a*b*B^2*c*d*n
*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 8*a*b*B^2*d^2*n*x*Log[c
+ d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 4*b^2*B^2*d^2*n*x^2*Log[c + d*x
]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 8*b^2*B^2*c^2*n*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 16*a*b*B^2*c*d*n
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c + d*x)^
n] - 8*a^2*B^2*d^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*(a
+ b*x)^n)/(c + d*x)^n] + 4*b^2*B^2*c*d*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2
 - 8*a*b*B^2*d^2*x*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 2*b^2*B^2*d^2*x^2*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 4*b^2*B^2*c^2*Log[c + d*x]*Log[(e*(a +
b*x)^n)/(c + d*x)^n]^2 + 8*a*b*B^2*c*d*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2 + 8*a*b*B^2*d^2*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]
^2 + 4*b^2*B^2*d^2*x^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 4*

```
B*(b*c - a*d)^2*n*(2*A - B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 4*B^2*(b*c - a*d)
^2*n^2*(-3 + 2*Log[c + d*x])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 8*b^2*
B^2*c^2*n^2*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] - 16*a*b*B^2*c*d*n^2*P
olyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] + 8*a^2*B^2*d^2*n^2*PolyLog[3, (d*(
a + b*x))/(-(b*c) + a*d)] + 8*b^2*B^2*c^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c
 - a*d)] - 16*a*b*B^2*c*d*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 8*a^2
*B^2*d^2*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)]))/(8*b*d^2)
```

Maple [F] time = 6.112, size = 0, normalized size = 0.

$$\int (bx+a)\left(A+B\ln\left(\frac{e\,(bx+a)^{n}}{(dx+c)^{n}}\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((b*x+a)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxima
")
```

```
[Out] 3/2*A^2*B*b*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^3*b*x^2 + 3*A^2*B*a*
x*log((b*x + a)^n*e/(d*x + c)^n) + A^3*a*x + 3*(a*e*n*log(b*x + a)/b - c*e*
n*log(d*x + c)/d)*A^2*B*a/e - 3/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d
*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*b/e - 1/2*((B^3*b^2*d^2*x^
2 + 2*B^3*a*b*d^2*x)*log((d*x + c)^n)^3 - 3*(B^3*a^2*d^2*n*log(b*x + a) + (
b^2*c^2*n - 2*a*b*c*d*n)*B^3*log(d*x + c) + (B^3*b^2*d^2*log(e) + A*B^2*b^2
*d^2)*x^2 + (2*A*B^2*a*b*d^2 + (a*b*d^2*(n + 2*log(e)) - b^2*c*d*n)*B^3)*x
+ (B^3*b^2*d^2*x^2 + 2*B^3*a*b*d^2*x)*log((b*x + a)^n))*log((d*x + c)^n)^2)
/(b*d^2) - integrate(-(B^3*a*b*c*d*log(e)^3 + 3*A*B^2*a*b*c*d*log(e)^2 + (B
^3*b^2*d^2*x^2 + B^3*a*b*c*d + (b^2*c*d + a*b*d^2)*B^3*x)*log((b*x + a)^n)^
```

```
3 + (B^3*b^2*d^2*log(e)^3 + 3*A*B^2*b^2*d^2*log(e)^2)*x^2 + 3*(B^3*a*b*c*d*
log(e) + A*B^2*a*b*c*d + (B^3*b^2*d^2*log(e) + A*B^2*b^2*d^2)*x^2 + ((b^2*c
*d + a*b*d^2)*A*B^2 + (b^2*c*d*log(e) + a*b*d^2*log(e))*B^3)*x)*log((b*x +
a)^n)^2 + (3*(b^2*c*d*log(e)^2 + a*b*d^2*log(e)^2)*A*B^2 + (b^2*c*d*log(e)^
3 + a*b*d^2*log(e)^3)*B^3)*x + 3*(B^3*a*b*c*d*log(e)^2 + 2*A*B^2*a*b*c*d*lo
g(e) + (B^3*b^2*d^2*log(e)^2 + 2*A*B^2*b^2*d^2*log(e))*x^2 + (2*(b^2*c*d*lo
g(e) + a*b*d^2*log(e))*A*B^2 + (b^2*c*d*log(e)^2 + a*b*d^2*log(e)^2)*B^3)*x
)*log((b*x + a)^n) - 3*(B^3*a^2*d^2*n^2*log(b*x + a) + B^3*a*b*c*d*log(e)^2
 + 2*A*B^2*a*b*c*d*log(e) + (b^2*c^2*n^2 - 2*a*b*c*d*n^2)*B^3*log(d*x + c)
+ ((n*log(e) + log(e)^2)*B^3*b^2*d^2 + A*B^2*b^2*d^2*(n + 2*log(e)))*x^2 +
(B^3*b^2*d^2*x^2 + B^3*a*b*c*d + (b^2*c*d + a*b*d^2)*B^3*x)*log((b*x + a)^n
)^2 + (2*(a*b*d^2*(n + log(e)) + b^2*c*d*log(e))*A*B^2 - ((n^2 - log(e)^2)*
b^2*c*d - (n^2 + 2*n*log(e) + log(e)^2)*a*b*d^2)*B^3)*x + (2*B^3*a*b*c*d*lo
g(e) + 2*A*B^2*a*b*c*d + (B^3*b^2*d^2*(n + 2*log(e)) + 2*A*B^2*b^2*d^2)*x^2
 + 2*((b^2*c*d + a*b*d^2)*A*B^2 + (a*b*d^2*(n + log(e)) + b^2*c*d*log(e))*B
^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b*d^2*x + b*c*d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^3bx + A^3a + \left(B^3bx + B^3a\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\left(AB^2bx + AB^2a\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\left(A^2Bbx + A^2Ba\right)\mathrm{l}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fricas
")
```

```
[Out] integral(A^3*b*x + A^3*a + (B^3*b*x + B^3*a)*log((b*x + a)^n*e/(d*x + c)^n)
^3 + 3*(A*B^2*b*x + A*B^2*a)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*b*
x + A^2*B*a)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

3.167 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{a+bx}\,dx$

Optimal. Leaf size=186

$$\frac{6B^2n^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)}{b}+\frac{3Bn\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - (b*(c + d*x))/(d*(a +
 b*x))])/b) + (3*B*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*PolyLog[2,
(b*(c + d*x))/(d*(a + b*x))])/b + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c
+ d*x)^n])*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/b + (6*B^3*n^3*PolyLog[
4, (b*(c + d*x))/(d*(a + b*x))])/b
```

Rubi [B] time = 0.850658, antiderivative size = 424, normalized size of antiderivative = 2.28, number of steps used = 14, number of rules used = 9, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {6742, 2488, 2411, 2343, 2333, 2315, 2506, 6610, 2508}

$$\frac{3A^2Bn\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b}+\frac{6AB^2n\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{6AB^2n^2\text{PolyLog}\left(3,\frac{b}{d(}\right.}{b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x),x]
```

```
[Out] (A^3*Log[a + b*x])/b - (3*A^2*B*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a
 + b*x)^n)/(c + d*x)^n])/b - (3*A*B^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log
[(e*(a + b*x)^n)/(c + d*x)^n]^2)/b - (B^3*Log[-((b*c - a*d)/(d*(a + b*x)))]
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/b + (3*A^2*B*n*PolyLog[2, 1 + (b*c - a
*d)/(d*(a + b*x))])/b + (6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog
[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (3*B^3*n*Log[(e*(a + b*x)^n)/(c + d
*x)^n]^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (6*A*B^2*n^2*PolyLo
g[3, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/b + (6*B^3*n^3*PolyLog
[4, 1 + (b*c - a*d)/(d*(a + b*x))])/b
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{a+bx}\,dx = \int \left(\frac{A^3}{a+bx}+\frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{a+bx}+\frac{3AB^2\log^2(e(a+bx)^n(c+\right.$$

$$= \frac{A^3\log(a+bx)}{b}+\left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{a+bx}\,dx+\left(3AB^2\right)\int \frac{\log}{}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{3AB^2\,\mathrm{lo}}{}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{3AB^2\,\mathrm{lo}}{}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{3AB^2\,\mathrm{lo}}{}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{3AB^2\,\mathrm{lo}}{}$$

$$= \frac{A^3\log(a+bx)}{b}-\frac{3A^2B\log\left(-\frac{bc-ad}{d(a+bx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{3AB^2\,\mathrm{lo}}{}$$

Mathematica [B] time = 1.02327, size = 2513, normalized size = 13.51

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x),x]
```

```
[Out] (4*A^3*Log[a + b*x] - 6*A^2*B*n*Log[a + b*x]^2 + 4*A*B^2*n^2*Log[a + b*x]^3
 - B^3*n^3*Log[a + b*x]^4 + B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^4 - 4
*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^3*Log[-((d*(a + b*x))/(b*(c + d*
x)))] + 6*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^2*Log[-((d*(a + b*x))/(
b*(c + d*x)))]^2 - 4*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[-((d*(a
+ b*x))/(b*(c + d*x)))]^3 + B^3*n^3*Log[-((d*(a + b*x))/(b*(c + d*x)))]^4 -
 12*A*B^2*n^2*Log[a + b*x]*Log[c + d*x]^2 + 12*B^3*n^3*Log[a + b*x]^2*Log[c
 + d*x]^2 + 12*A*B^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 -
 12*B^3*n^3*Log[a + b*x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[c + d*x]^2 -
 8*B^3*n^3*Log[a + b*x]*Log[c + d*x]^3 + 8*B^3*n^3*Log[(d*(a + b*x))/(-(b*c
) + a*d)]*Log[c + d*x]^3 + 12*A^2*B*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c -
 a*d)] - 12*A*B^2*n^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)] + 4*B^3
*n^3*Log[a + b*x]^3*Log[(b*(c + d*x))/(b*c - a*d)] + 8*B^3*n^3*Log[(d*(a +
b*x))/(-(b*c) + a*d)]^3*Log[(b*(c + d*x))/(b*c - a*d)] - 12*B^3*n^3*Log[(d*
(a + b*x))/(-(b*c) + a*d)]^2*Log[-((d*(a + b*x))/(b*(c + d*x)))]*Log[(b*(c
+ d*x))/(b*c - a*d)] + 24*A*B^2*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c + d
*x))/(b*c - a*d)] - 24*B^3*n^3*Log[a + b*x]^2*Log[c + d*x]*Log[(b*(c + d*x)
)/(b*c - a*d)] + 12*B^3*n^3*Log[a + b*x]*Log[c + d*x]^2*Log[(b*(c + d*x))/(
b*c - a*d)] + 6*B^3*n^3*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]^2 + 1
2*B^3*n^3*Log[a + b*x]*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[(b*(c + d*x))/
(b*c - a*d)]^2 - 18*B^3*n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]^2*Log[(b*(c +
 d*x))/(b*c - a*d)]^2 + 12*A^2*B*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)
^n] - 12*A*B^2*n*Log[a + b*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 4*B^3*n^
2*Log[a + b*x]^3*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 12*B^3*n^2*Log[a + b*x]
*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 12*B^3*n^2*Log[(d*(a + b
*x))/(-(b*c) + a*d)]*Log[c + d*x]^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 24*A
*B^2*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c +
 d*x)^n] - 12*B^3*n^2*Log[a + b*x]^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[(e*
(a + b*x)^n)/(c + d*x)^n] + 24*B^3*n^2*Log[a + b*x]*Log[c + d*x]*Log[(b*(c
+ d*x))/(b*c - a*d)]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 12*A*B^2*Log[a + b*
x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 6*B^3*n*Log[a + b*x]^2*Log[(e*(a +
b*x)^n)/(c + d*x)^n]^2 + 12*B^3*n*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d
)]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 4*B^3*Log[a + b*x]*Log[(e*(a + b*x)
^n)/(c + d*x)^n]^3 - 4*B^3*n^3*Log[-((d*(a + b*x))/(b*(c + d*x)))]^3*Log[(b
*c - a*d)/(b*c + b*d*x)] + 12*B*n*(A^2 + B^2*n^2*Log[(d*(a + b*x))/(-(b*c)
+ a*d)]^2 + B^2*n^2*Log[c + d*x]^2 + 2*B^2*n^2*Log[a + b*x]*Log[(b*(c + d*x
))/(b*c - a*d)] - 2*B^2*n^2*Log[(d*(a + b*x))/(-(b*c) + a*d)]*(Log[-((d*(a
+ b*x))/(b*(c + d*x)))] + Log[(b*(c + d*x))/(b*c - a*d)]) + 2*A*B*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*B*n*Lo
g[c + d*x]*(A - B*n*Log[a + b*x] + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))*Pol
```

```
yLog[2, (d*(a + b*x))/(-(b*c) + a*d)] - 12*B^3*n^3*Log[-((d*(a + b*x))/(b*(
c + d*x)))]^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] + 12*B^3*n^3*Log[(d*(
a + b*x))/(-(b*c) + a*d)]^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*
n^3*Log[(d*(a + b*x))/(-(b*c) + a*d)]*Log[-((d*(a + b*x))/(b*(c + d*x)))]*P
olyLog[2, (b*(c + d*x))/(b*c - a*d)] + 12*B^3*n^3*Log[-((d*(a + b*x))/(b*(c
 + d*x)))]^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 24*A*B^2*n^2*Log[c + d
*x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^3*Log[a + b*x]*Log[c +
 d*x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] + 12*B^3*n^3*Log[c + d*x]^2*Pol
yLog[2, (b*(c + d*x))/(b*c - a*d)] + 24*B^3*n^3*Log[a + b*x]*Log[(b*(c + d*
x))/(b*c - a*d)]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^3*Log[(d*
(a + b*x))/(-(b*c) + a*d)]*Log[(b*(c + d*x))/(b*c - a*d)]*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)] + 24*B^3*n^2*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x
)^n]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 24*A*B^2*n^2*PolyLog[3, (d*(a
+ b*x))/(-(b*c) + a*d)] + 24*B^3*n^3*Log[-((d*(a + b*x))/(b*(c + d*x)))]*Po
lyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] - 24*B^3*n^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]*PolyLog[3, (d*(a + b*x))/(-(b*c) + a*d)] + 24*B^3*n^3*Log[-((d*(a
 + b*x))/(b*(c + d*x)))]*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 24*A*B^2
*n^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] + 24*B^3*n^3*Log[-((d*(a + b*x))
/(b*(c + d*x)))]*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^2*Log[(e*
(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, (b*(c + d*x))/(b*c - a*d)] - 24*B^3*n^
3*PolyLog[4, (d*(a + b*x))/(b*(c + d*x))])/(4*b)
```

Maple [F] time = 2.592, size = 0, normalized size = 0.

$$\int \frac{1}{bx+a}\left(A+B\ln\left(\frac{e\,(bx+a)^{n}}{(dx+c)^{n}}\right)\right)^{3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{B^{3}\log(bx+a)\log\left((dx+c)^{n}\right)^{3}}{b}+\frac{A^{3}\log(bx+a)}{b}+\int\frac{B^{3}bc\log(e)^{3}+3\,AB^{2}bc\log(e)^{2}+3\,A^{2}Bbc\log(e)+\left(B^{3}bdx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x, algorithm="maxima
")
```

```
[Out] -B^3*log(b*x + a)*log((d*x + c)^n)^3/b + A^3*log(b*x + a)/b + integrate((B^
3*b*c*log(e)^3 + 3*A*B^2*b*c*log(e)^2 + 3*A^2*B*b*c*log(e) + (B^3*b*d*x + B
^3*b*c)*log((b*x + a)^n)^3 + 3*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*log(e
) + A*B^2*b*d)*x)*log((b*x + a)^n)^2 + 3*(B^3*b*c*log(e) + A*B^2*b*c + (B^3
*b*d*log(e) + A*B^2*b*d)*x + (B^3*b*d*n*x + B^3*a*d*n)*log(b*x + a) + (B^3*
b*d*x + B^3*b*c)*log((b*x + a)^n))*log((d*x + c)^n)^2 + (B^3*b*d*log(e)^3 +
 3*A*B^2*b*d*log(e)^2 + 3*A^2*B*b*d*log(e))*x + 3*(B^3*b*c*log(e)^2 + 2*A*B
^2*b*c*log(e) + A^2*B*b*c + (B^3*b*d*log(e)^2 + 2*A*B^2*b*d*log(e) + A^2*B*
b*d)*x)*log((b*x + a)^n) - 3*(B^3*b*c*log(e)^2 + 2*A*B^2*b*c*log(e) + A^2*B
*b*c + (B^3*b*d*x + B^3*b*c)*log((b*x + a)^n)^2 + (B^3*b*d*log(e)^2 + 2*A*B
^2*b*d*log(e) + A^2*B*b*d)*x + 2*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*log
(e) + A*B^2*b*d)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d*x^2 + a*b*c
+ (b^2*c + a*b*d)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{bx+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x, algorithm="fricas
")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(b*x + a), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a), x)
```

3.168 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^2}\,dx$

Optimal. Leaf size=184

$$-\frac{6B^2n^2(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)}-\frac{3Bn(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{(a+bx)(bc-ad)}-\frac{(c+dx)\left(B\log\left(e\right.\right.}{(a+}$$

```
[Out] (-6*B^3*n^3*(c + d*x))/((b*c - a*d)*(a + b*x)) - (6*B^2*n^2*(c + d*x)*(A +
B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/((b*c - a*d)*(a + b*x)) - (3*B*n*(c +
d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*d)*(a + b*x)) -
((c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/((b*c - a*d)*(a + b*
x))
```

Rubi [A] time = 0.314674, antiderivative size = 360, normalized size of antiderivative = 1.96, number of steps used = 11, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {6742, 2490, 32}

$$-\frac{3A^2B(c+dx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{3A^2Bn}{b(a+bx)}-\frac{A^3}{b(a+bx)}-\frac{3AB^2(c+dx)\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)}{(a+bx)(bc-ad)}-\frac{6AB^2n(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^2,x]
```

```
[Out] -(A^3/(b*(a + b*x))) - (3*A^2*B*n)/(b*(a + b*x)) - (6*A*B^2*n^2)/(b*(a + b*
x)) - (6*B^3*n^3)/(b*(a + b*x)) - (3*A^2*B*(c + d*x)*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/((b*c - a*d)*(a + b*x)) - (6*A*B^2*n*(c + d*x)*Log[(e*(a + b*x)
^n)/(c + d*x)^n])/((b*c - a*d)*(a + b*x)) - (6*B^3*n^2*(c + d*x)*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/((b*c - a*d)*(a + b*x)) - (3*A*B^2*(c + d*x)*Log[(e
*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)*(a + b*x)) - (3*B^3*n*(c + d*x)*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)*(a + b*x)) - (B^3*(c + d*x
)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/((b*c - a*d)*(a + b*x))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^2}\,dx = \int \left(\frac{A^3}{(a+bx)^2} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^2} + \frac{3AB^2\log^2(e(a+bx)^n(c\right.$$

$$= -\frac{A^3}{b(a+bx)} + \left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^2}\,dx + \left(3AB^2\right)\int \frac{\log^2(e\right.$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2B(c+dx)\log(e(a+bx)^n(c+dx)^{-n})}{(bc-ad)(a+bx)} - \frac{3AB^2(c+dx)\log^2}{(bc-a}$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2Bn}{b(a+bx)} - \frac{3A^2B(c+dx)\log(e(a+bx)^n(c+dx)^{-n})}{(bc-ad)(a+bx)} - \frac{6AB^2}{}$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2Bn}{b(a+bx)} - \frac{6AB^2n^2}{b(a+bx)} - \frac{3A^2B(c+dx)\log(e(a+bx)^n(c+dx}{(bc-ad)(a+bx)}$$

$$= -\frac{A^3}{b(a+bx)} - \frac{3A^2Bn}{b(a+bx)} - \frac{6AB^2n^2}{b(a+bx)} - \frac{6B^3n^3}{b(a+bx)} - \frac{3A^2B(c+dx)\log(e(a+}{(bc-ad)(a+}$$

Mathematica [B] time = 0.756876, size = 524, normalized size = 2.85

$$\frac{-3Bdn(a+bx)\log(a+bx)\left(2B(A+Bn)\log(e(a+bx)^n(c+dx)^{-n}) + 2Bn\log(c+dx)\left(B\log(e(a+bx)^n(c+dx)^{-n}) + A\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^2,x]
```

```
[Out] (-(B^3*d*n^3*(a + b*x)*Log[a + b*x]^3) + B^3*d*n^3*(a + b*x)*Log[c + d*x]^3
 + 3*B^2*d*n^2*(a + b*x)*Log[c + d*x]^2*(A + B*n + B*Log[(e*(a + b*x)^n)/(c
```

```
 + d*x)^n]) + 3*B^2*d*n^2*(a + b*x)*Log[a + b*x]^2*(A + B*n + B*n*Log[c + d
*x] + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 3*B*d*n*(a + b*x)*Log[c + d*x]*
(A^2 + 2*A*B*n + 2*B^2*n^2 + 2*B*(A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 + B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2) - (b*c - a*d)*(A^3 + 3*A^2*B*n +
 6*A*B^2*n^2 + 6*B^3*n^3 + 3*B*(A^2 + 2*A*B*n + 2*B^2*n^2)*Log[(e*(a + b*x)
^n)/(c + d*x)^n] + 3*B^2*(A + B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + B^3
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3) - 3*B*d*n*(a + b*x)*Log[a + b*x]*(A^2
+ 2*A*B*n + 2*B^2*n^2 + B^2*n^2*Log[c + d*x]^2 + 2*B*(A + B*n)*Log[(e*(a +
b*x)^n)/(c + d*x)^n] + B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 2*B*n*Log[c
 + d*x]*(A + B*n + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))/(b*(b*c - a*d)*(a
+ b*x))
```

Maple [C] time = 11.812, size = 69354, normalized size = 376.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.50655, size = 1524, normalized size = 8.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x, algorithm="maxi
ma")
```

```
[Out] -B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^2*x + a*b) - (3*(d*e*n*log(b*x + a
)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) + e*n/(b^2*x + a*b))
*log((b*x + a)^n*e/(d*x + c)^n)^2/e + (3*(2*b*c*e^2*n^2 - 2*a*d*e^2*n^2 - (
b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a)^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)
*log(d*x + c)^2 + 2*(b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a) - 2*(b*d*e^2
*n^2*x + a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a))*log(d*x
+ c))*log((b*x + a)^n*e/(d*x + c)^n)/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d
)*x)*e) + (6*b*c*e^3*n^3 - 6*a*d*e^3*n^3 + (b*d*e^3*n^3*x + a*d*e^3*n^3)*lo
```

```
g(b*x + a)^3 - (b*d*e^3*n^3*x + a*d*e^3*n^3)*log(d*x + c)^3 - 3*(b*d*e^3*n^
3*x + a*d*e^3*n^3)*log(b*x + a)^2 - 3*(b*d*e^3*n^3*x + a*d*e^3*n^3 - (b*d*e
^3*n^3*x + a*d*e^3*n^3)*log(b*x + a))*log(d*x + c)^2 + 6*(b*d*e^3*n^3*x + a
*d*e^3*n^3)*log(b*x + a) - 3*(2*b*d*e^3*n^3*x + 2*a*d*e^3*n^3 + (b*d*e^3*n^
3*x + a*d*e^3*n^3)*log(b*x + a)^2 - 2*(b*d*e^3*n^3*x + a*d*e^3*n^3)*log(b*x
 + a))*log(d*x + c))/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x)*e^2))/e)*B^
3 - 3*A*B^2*(2*(d*e*n*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^
2*c - a*b*d) + e*n/(b^2*x + a*b))*log((b*x + a)^n*e/(d*x + c)^n)/e + (2*b*c
*e^2*n^2 - 2*a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2*n^2)*log(b*x + a)^2 - (
b*d*e^2*n^2*x + a*d*e^2*n^2)*log(d*x + c)^2 + 2*(b*d*e^2*n^2*x + a*d*e^2*n^
2)*log(b*x + a) - 2*(b*d*e^2*n^2*x + a*d*e^2*n^2 - (b*d*e^2*n^2*x + a*d*e^2
*n^2)*log(b*x + a))*log(d*x + c))/((a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x
)*e^2)) - 3*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^2*x + a*b) - 3*(d*e*n
*log(b*x + a)/(b^2*c - a*b*d) - d*e*n*log(d*x + c)/(b^2*c - a*b*d) + e*n/(b
^2*x + a*b))*A^2*B/e - 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^2*x + a*b)
 - A^3/(b^2*x + a*b)
```

Fricas [B] time = 1.23035, size = 1808, normalized size = 9.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x, algorithm="fric
as")
```

```
[Out] -(A^3*b*c - A^3*a*d + 6*(B^3*b*c - B^3*a*d)*n^3 + (B^3*b*d*n^3*x + B^3*b*c*
n^3)*log(b*x + a)^3 - (B^3*b*d*n^3*x + B^3*b*c*n^3)*log(d*x + c)^3 + (B^3*b
*c - B^3*a*d)*log(e)^3 + 6*(A*B^2*b*c - A*B^2*a*d)*n^2 + 3*(B^3*b*c*n^3 + A
*B^2*b*c*n^2 + (B^3*b*d*n^3 + A*B^2*b*d*n^2)*x + (B^3*b*d*n^2*x + B^3*b*c*n
^2)*log(e))*log(b*x + a)^2 + 3*(B^3*b*c*n^3 + A*B^2*b*c*n^2 + (B^3*b*d*n^3
+ A*B^2*b*d*n^2)*x + (B^3*b*d*n^3*x + B^3*b*c*n^3)*log(b*x + a) + (B^3*b*d*
n^2*x + B^3*b*c*n^2)*log(e))*log(d*x + c)^2 + 3*(A*B^2*b*c - A*B^2*a*d + (B
^3*b*c - B^3*a*d)*n)*log(e)^2 + 3*(A^2*B*b*c - A^2*B*a*d)*n + 3*(2*B^3*b*c*
n^3 + 2*A*B^2*b*c*n^2 + A^2*B*b*c*n + (B^3*b*d*n*x + B^3*b*c*n)*log(e)^2 +
(2*B^3*b*d*n^3 + 2*A*B^2*b*d*n^2 + A^2*B*b*d*n)*x + 2*(B^3*b*c*n^2 + A*B^2*
b*c*n + (B^3*b*d*n^2 + A*B^2*b*d*n)*x)*log(e))*log(b*x + a) - 3*(2*B^3*b*c*
n^3 + 2*A*B^2*b*c*n^2 + A^2*B*b*c*n + (B^3*b*d*n^3*x + B^3*b*c*n^3)*log(b*x
 + a)^2 + (B^3*b*d*n*x + B^3*b*c*n)*log(e)^2 + (2*B^3*b*d*n^3 + 2*A*B^2*b*d
*n^2 + A^2*B*b*d*n)*x + 2*(B^3*b*c*n^3 + A*B^2*b*c*n^2 + (B^3*b*d*n^3 + A*B
^2*b*d*n^2)*x + (B^3*b*d*n^2*x + B^3*b*c*n^2)*log(e))*log(b*x + a) + 2*(B^3
*b*c*n^2 + A*B^2*b*c*n + (B^3*b*d*n^2 + A*B^2*b*d*n)*x)*log(e))*log(d*x + c
```

```
) + 3*(A^2*B*b*c - A^2*B*a*d + 2*(B^3*b*c - B^3*a*d)*n^2 + 2*(A*B^2*b*c - A
*B^2*a*d)*n)*log(e))/(a*b^2*c - a^2*b*d + (b^3*c - a*b^2*d)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^2, x)
```

3.169 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^3}\,dx$

Optimal. Leaf size=390

$$-\frac{3bB^2n^2(c+dx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{4(a+bx)^2(bc-ad)^2}+\frac{6B^2dn^2(c+dx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{(a+bx)(bc-ad)^2}-\frac{3bBn(c+a}{}$$

```
[Out] (6*B^3*d*n^3*(c + d*x))/((b*c - a*d)^2*(a + b*x)) - (3*b*B^3*n^3*(c + d*x)^
2)/(8*(b*c - a*d)^2*(a + b*x)^2) + (6*B^2*d*n^2*(c + d*x)*(A + B*Log[(e*(a
+ b*x)^n)/(c + d*x)^n]))/((b*c - a*d)^2*(a + b*x)) - (3*b*B^2*n^2*(c + d*x)
^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(4*(b*c - a*d)^2*(a + b*x)^2)
+ (3*B*d*n*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*
d)^2*(a + b*x)) - (3*b*B*n*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)
^n])^2)/(4*(b*c - a*d)^2*(a + b*x)^2) + (d*(c + d*x)*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])^3)/((b*c - a*d)^2*(a + b*x)) - (b*(c + d*x)^2*(A + B*Log
[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(2*(b*c - a*d)^2*(a + b*x)^2)
```

Rubi [B] time = 0.803893, antiderivative size = 811, normalized size of antiderivative = 2.08, number of steps used = 21, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {6742, 2492, 44, 2491, 2490, 32, 2509, 37}

$$-\frac{A^3}{2b(a+bx)^2}+\frac{3Bd^2n\log(a+bx)A^2}{2b(bc-ad)^2}-\frac{3Bd^2n\log(c+dx)A^2}{2b(bc-ad)^2}-\frac{3B\log\left(e(a+bx)^n(c+dx)^{-n}\right)A^2}{2b(a+bx)^2}+\frac{3BdnA^2}{2b(bc-ad)(a+bx}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^3,x]
```

```
[Out] -A^3/(2*b*(a + b*x)^2) - (3*A^2*B*n)/(4*b*(a + b*x)^2) + (3*A^2*B*d*n)/(2*b
*(b*c - a*d)*(a + b*x)) + (6*A*B^2*d*n^2)/(b*(b*c - a*d)*(a + b*x)) + (6*B^
3*d*n^3)/(b*(b*c - a*d)*(a + b*x)) - (3*A*b*B^2*n^2*(c + d*x)^2)/(4*(b*c -
a*d)^2*(a + b*x)^2) - (3*b*B^3*n^3*(c + d*x)^2)/(8*(b*c - a*d)^2*(a + b*x)^
2) + (3*A^2*B*d^2*n*Log[a + b*x])/(2*b*(b*c - a*d)^2) - (3*A^2*B*d^2*n*Log[
c + d*x])/(2*b*(b*c - a*d)^2) - (3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/
(2*b*(a + b*x)^2) + (6*A*B^2*d*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]
)/((b*c - a*d)^2*(a + b*x)) + (6*B^3*d*n^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/((b*c - a*d)^2*(a + b*x)) - (3*A*b*B^2*n*(c + d*x)^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(2*(b*c - a*d)^2*(a + b*x)^2) - (3*b*B^3*n^2*(c + d
*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*(b*c - a*d)^2*(a + b*x)^2) + (3*
A*B^2*d*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d)^2*(a + b
*x)) + (3*B^3*d*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*c - a*d
```

```
)^2*(a + b*x)) - (3*A*b*B^2*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)
/(2*(b*c - a*d)^2*(a + b*x)^2) - (3*b*B^3*n*(c + d*x)^2*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2)/(4*(b*c - a*d)^2*(a + b*x)^2) + (B^3*d*(c + d*x)*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^3)/((b*c - a*d)^2*(a + b*x)) - (b*B^3*(c + d*x)^2*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(2*(b*c - a*d)^2*(a + b*x)^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
```

```
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^3}\,dx = \int \left(\frac{A^3}{(a+bx)^3} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3} + \frac{3AB^2\log^2(e(a+bx)^n(c-}{(a+bx)^3} \right.$$

$$= -\frac{A^3}{2b(a+bx)^2} + \left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^3}\,dx + \left(3AB^2\right)\int \frac{\log^2(e}{}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{2b(a+bx)^2} + \frac{\left(3AbB^2\right)\int \frac{(c+dx)\log^2(e(a+b}{(a+bx)}}{bc-ad}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{2b(a+bx)^2} + \frac{3AB^2d(c+dx)\log^2(e(a-}{(bc-ad)^2(a-}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2Bn}{4b(a+bx)^2} + \frac{3A^2Bdn}{2b(bc-ad)(a+bx)} + \frac{3A^2Bd^2n\log(a+bx)}{2b(bc-ad)^2} -$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2Bn}{4b(a+bx)^2} + \frac{3A^2Bdn}{2b(bc-ad)(a+bx)} + \frac{6AB^2dn^2}{b(bc-ad)(a+bx)} - \frac{3}{4}$$

$$= -\frac{A^3}{2b(a+bx)^2} - \frac{3A^2Bn}{4b(a+bx)^2} + \frac{3A^2Bdn}{2b(bc-ad)(a+bx)} + \frac{6AB^2dn^2}{b(bc-ad)(a+bx)} + \frac{}{b}$$

Mathematica [A] time = 1.15434, size = 693, normalized size = 1.78

$$-\frac{-6Bd^2n(a+bx)^2\log(a+bx)\left(2B(2A+3Bn)\log(e(a+bx)^n(c+dx)^{-n}) + 2Bn\log(c+dx)(2B\log(e(a+bx)^n(c+dx)^{-n})\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^3,x]
```

```
[Out] -(-4*B^3*d^2*n^3*(a + b*x)^2*Log[a + b*x]^3 + 4*B^3*d^2*n^3*(a + b*x)^2*Log
[c + d*x]^3 + 6*B^2*d^2*n^2*(a + b*x)^2*Log[c + d*x]^2*(2*A + 3*B*n + 2*B*L
og[(e*(a + b*x)^n)/(c + d*x)^n]) + 6*B^2*d^2*n^2*(a + b*x)^2*Log[a + b*x]^2
*(2*A + 3*B*n + 2*B*n*Log[c + d*x] + 2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])
+ 6*B*d^2*n*(a + b*x)^2*Log[c + d*x]*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B*(2*
A + 3*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2) + (b*c - a*d)*(4*A^3*(b*c - a*d) + 3*B^3*n^3*(-15*a*d + b*(c -
 14*d*x)) + 6*A*B^2*n^2*(-7*a*d + b*(c - 6*d*x)) + 6*A^2*B*n*(-3*a*d + b*(c
 - 2*d*x)) + 6*B*(2*A^2*(b*c - a*d) + B^2*n^2*(-7*a*d + b*(c - 6*d*x)) + 2*
A*B*n*(-3*a*d + b*(c - 2*d*x)))*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 6*B^2*(2
*A*(b*c - a*d) + B*n*(-3*a*d + b*(c - 2*d*x)))*Log[(e*(a + b*x)^n)/(c + d*x
)^n]^2 + 4*B^3*(b*c - a*d)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3) - 6*B*d^2*n*
(a + b*x)^2*Log[a + b*x]*(2*A^2 + 6*A*B*n + 7*B^2*n^2 + 2*B^2*n^2*Log[c + d
```

```
*x]^2 + 2*B*(2*A + 3*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*B^2*Log[(e*(
a + b*x)^n)/(c + d*x)^n]^2 + 2*B*n*Log[c + d*x]*(2*A + 3*B*n + 2*B*Log[(e*(
a + b*x)^n)/(c + d*x)^n])))/(8*b*(b*c - a*d)^2*(a + b*x)^2)
```

Maple [C] time = 18.137, size = 120138, normalized size = 308.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.97299, size = 3032, normalized size = 7.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x, algorithm="maxi
ma")
```

```
[Out] -1/2*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^3*x^2 + 2*a*b^2*x + a^2*b) + 1
/8*(6*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*d^2*e
*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b*c*e*
n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3*c -
a^2*b^2*d)*x))*log((b*x + a)^n*e/(d*x + c)^n)^2/e - (6*(b^2*c^2*e^2*n^2 - 8
*a*b*c*d*e^2*n^2 + 7*a^2*d^2*e^2*n^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e
^2*n^2*x + a^2*d^2*e^2*n^2)*log(b*x + a)^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b
*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*log(d*x + c)^2 - 6*(b^2*c*d*e^2*n^2 - a*b
*d^2*e^2*n^2)*x - 6*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^
2*n^2)*log(b*x + a) + 2*(3*b^2*d^2*e^2*n^2*x^2 + 6*a*b*d^2*e^2*n^2*x + 3*a^
2*d^2*e^2*n^2 - 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*
n^2)*log(b*x + a))*log(d*x + c))*log((b*x + a)^n*e/(d*x + c)^n)/((a^2*b^3*c
^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2
+ 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)*e) + (3*b^2*c^2*e^3*n^3 -
48*a*b*c*d*e^3*n^3 + 45*a^2*d^2*e^3*n^3 - 4*(b^2*d^2*e^3*n^3*x^2 + 2*a*b*d^
2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a)^3 + 4*(b^2*d^2*e^3*n^3*x^2 + 2*
```

```
a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(d*x + c)^3 + 18*(b^2*d^2*e^3*n^3*x
^2 + 2*a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a)^2 + 6*(3*b^2*d^2*e
^3*n^3*x^2 + 6*a*b*d^2*e^3*n^3*x + 3*a^2*d^2*e^3*n^3 - 2*(b^2*d^2*e^3*n^3*x
^2 + 2*a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a))*log(d*x + c)^2 -
42*(b^2*c*d*e^3*n^3 - a*b*d^2*e^3*n^3)*x - 42*(b^2*d^2*e^3*n^3*x^2 + 2*a*b*
d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a) + 6*(7*b^2*d^2*e^3*n^3*x^2 +
14*a*b*d^2*e^3*n^3*x + 7*a^2*d^2*e^3*n^3 + 2*(b^2*d^2*e^3*n^3*x^2 + 2*a*b*d
^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a)^2 - 6*(b^2*d^2*e^3*n^3*x^2 + 2
*a*b*d^2*e^3*n^3*x + a^2*d^2*e^3*n^3)*log(b*x + a))*log(d*x + c))/((a^2*b^3
*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^
2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)*e^2))/e)*B^3 + 3/4*A*B^2
*(2*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) - 2*d^2*e*n
*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b*d*e*n*x - b*c*e*n
+ 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^2 + 2*(a*b^3*c - a^
2*b^2*d)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e - (b^2*c^2*e^2*n^2 - 8*a*b*c*
d*e^2*n^2 + 7*a^2*d^2*e^2*n^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*
x + a^2*d^2*e^2*n^2)*log(b*x + a)^2 + 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^
2*n^2*x + a^2*d^2*e^2*n^2)*log(d*x + c)^2 - 6*(b^2*c*d*e^2*n^2 - a*b*d^2*e^
2*n^2)*x - 6*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*
log(b*x + a) + 2*(3*b^2*d^2*e^2*n^2*x^2 + 6*a*b*d^2*e^2*n^2*x + 3*a^2*d^2*e
^2*n^2 - 2*(b^2*d^2*e^2*n^2*x^2 + 2*a*b*d^2*e^2*n^2*x + a^2*d^2*e^2*n^2)*lo
g(b*x + a))*log(d*x + c))/((a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*
c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b
^2*d^2)*x)*e^2)) - 3/2*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^3*x^2 + 2*
a*b^2*x + a^2*b) + 3/4*(2*d^2*e*n*log(b*x + a)/(b^3*c^2 - 2*a*b^2*c*d + a^2
*b*d^2) - 2*d^2*e*n*log(d*x + c)/(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2) + (2*b
*d*e*n*x - b*c*e*n + 3*a*d*e*n)/(a^2*b^2*c - a^3*b*d + (b^4*c - a*b^3*d)*x^
2 + 2*(a*b^3*c - a^2*b^2*d)*x))*A^2*B/e - 3/2*A^2*B*log((b*x + a)^n*e/(d*x
+ c)^n)/(b^3*x^2 + 2*a*b^2*x + a^2*b) - 1/2*A^3/(b^3*x^2 + 2*a*b^2*x + a^2*
b)
```

Fricas [B] time = 1.49427, size = 4618, normalized size = 11.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x, algorithm="fric
as")
```

```
[Out] -1/8*(4*A^3*b^2*c^2 - 8*A^3*a*b*c*d + 4*A^3*a^2*d^2 + 3*(B^3*b^2*c^2 - 16*B
^3*a*b*c*d + 15*B^3*a^2*d^2)*n^3 - 4*(B^3*b^2*d^2*n^3*x^2 + 2*B^3*a*b*d^2*n
```

```
^3*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n^3)*log(b*x + a)^3 + 4*(B^3*b^2*d^2*n
^3*x^2 + 2*B^3*a*b*d^2*n^3*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n^3)*log(d*x +
 c)^3 + 4*(B^3*b^2*c^2 - 2*B^3*a*b*c*d + B^3*a^2*d^2)*log(e)^3 + 6*(A*B^2*b
^2*c^2 - 8*A*B^2*a*b*c*d + 7*A*B^2*a^2*d^2)*n^2 + 6*((B^3*b^2*c^2 - 4*B^3*a
*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b*c*d)*n^2 - (3*B^3*b^2*d^2*n^3
+ 2*A*B^2*b^2*d^2*n^2)*x^2 - 2*(2*A*B^2*a*b*d^2*n^2 + (B^3*b^2*c*d + 2*B^3*
a*b*d^2)*n^3)*x - 2*(B^3*b^2*d^2*n^2*x^2 + 2*B^3*a*b*d^2*n^2*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^2)*log(e))*log(b*x + a)^2 + 6*((B^3*b^2*c^2 - 4*B^3*a
*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b*c*d)*n^2 - (3*B^3*b^2*d^2*n^3
+ 2*A*B^2*b^2*d^2*n^2)*x^2 - 2*(2*A*B^2*a*b*d^2*n^2 + (B^3*b^2*c*d + 2*B^3*
a*b*d^2)*n^3)*x - 2*(B^3*b^2*d^2*n^3*x^2 + 2*B^3*a*b*d^2*n^3*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^3)*log(b*x + a) - 2*(B^3*b^2*d^2*n^2*x^2 + 2*B^3*a*b*
d^2*n^2*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n^2)*log(e))*log(d*x + c)^2 + 6*(
2*A*B^2*b^2*c^2 - 4*A*B^2*a*b*c*d + 2*A*B^2*a^2*d^2 - 2*(B^3*b^2*c*d - B^3*
a*b*d^2)*n*x + (B^3*b^2*c^2 - 4*B^3*a*b*c*d + 3*B^3*a^2*d^2)*n)*log(e)^2 +
6*(A^2*B*b^2*c^2 - 4*A^2*B*a*b*c*d + 3*A^2*B*a^2*d^2)*n - 6*(7*(B^3*b^2*c*d
 - B^3*a*b*d^2)*n^3 + 6*(A*B^2*b^2*c*d - A*B^2*a*b*d^2)*n^2 + 2*(A^2*B*b^2*
c*d - A^2*B*a*b*d^2)*n)*x + 6*((B^3*b^2*c^2 - 8*B^3*a*b*c*d)*n^3 + 2*(A*B^2
*b^2*c^2 - 4*A*B^2*a*b*c*d)*n^2 - (7*B^3*b^2*d^2*n^3 + 6*A*B^2*b^2*d^2*n^2
+ 2*A^2*B*b^2*d^2*n)*x^2 - 2*(B^3*b^2*d^2*n*x^2 + 2*B^3*a*b*d^2*n*x - (B^3*
b^2*c^2 - 2*B^3*a*b*c*d)*n)*log(e)^2 + 2*(A^2*B*b^2*c^2 - 2*A^2*B*a*b*c*d)*
n - 2*(2*A^2*B*a*b*d^2*n + (3*B^3*b^2*c*d + 4*B^3*a*b*d^2)*n^3 + 2*(A*B^2*b
^2*c*d + 2*A*B^2*a*b*d^2)*n^2)*x + 2*((B^3*b^2*c^2 - 4*B^3*a*b*c*d)*n^2 - (
3*B^3*b^2*d^2*n^2 + 2*A*B^2*b^2*d^2*n)*x^2 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b
*c*d)*n - 2*(2*A*B^2*a*b*d^2*n + (B^3*b^2*c*d + 2*B^3*a*b*d^2)*n^2)*x)*log(
e))*log(b*x + a) - 6*((B^3*b^2*c^2 - 8*B^3*a*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2
- 4*A*B^2*a*b*c*d)*n^2 - (7*B^3*b^2*d^2*n^3 + 6*A*B^2*b^2*d^2*n^2 + 2*A^2*B
*b^2*d^2*n)*x^2 - 2*(B^3*b^2*d^2*n^3*x^2 + 2*B^3*a*b*d^2*n^3*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^3)*log(b*x + a)^2 - 2*(B^3*b^2*d^2*n*x^2 + 2*B^3*a*b*
d^2*n*x - (B^3*b^2*c^2 - 2*B^3*a*b*c*d)*n)*log(e)^2 + 2*(A^2*B*b^2*c^2 - 2*
A^2*B*a*b*c*d)*n - 2*(2*A^2*B*a*b*d^2*n + (3*B^3*b^2*c*d + 4*B^3*a*b*d^2)*n
^3 + 2*(A*B^2*b^2*c*d + 2*A*B^2*a*b*d^2)*n^2)*x + 2*((B^3*b^2*c^2 - 4*B^3*a
*b*c*d)*n^3 + 2*(A*B^2*b^2*c^2 - 2*A*B^2*a*b*c*d)*n^2 - (3*B^3*b^2*d^2*n^3
+ 2*A*B^2*b^2*d^2*n^2)*x^2 - 2*(2*A*B^2*a*b*d^2*n^2 + (B^3*b^2*c*d + 2*B^3*
a*b*d^2)*n^3)*x - 2*(B^3*b^2*d^2*n^2*x^2 + 2*B^3*a*b*d^2*n^2*x - (B^3*b^2*c
^2 - 2*B^3*a*b*c*d)*n^2)*log(e))*log(b*x + a) + 2*((B^3*b^2*c^2 - 4*B^3*a*b
*c*d)*n^2 - (3*B^3*b^2*d^2*n^2 + 2*A*B^2*b^2*d^2*n)*x^2 + 2*(A*B^2*b^2*c^2
- 2*A*B^2*a*b*c*d)*n - 2*(2*A*B^2*a*b*d^2*n + (B^3*b^2*c*d + 2*B^3*a*b*d^2)
*n^2)*x)*log(e))*log(d*x + c) + 6*(2*A^2*B*b^2*c^2 - 4*A^2*B*a*b*c*d + 2*A^
2*B*a^2*d^2 + (B^3*b^2*c^2 - 8*B^3*a*b*c*d + 7*B^3*a^2*d^2)*n^2 + 2*(A*B^2*
b^2*c^2 - 4*A*B^2*a*b*c*d + 3*A*B^2*a^2*d^2)*n - 2*(3*(B^3*b^2*c*d - B^3*a*
b*d^2)*n^2 + 2*(A*B^2*b^2*c*d - A*B^2*a*b*d^2)*n)*x)*log(e))/(a^2*b^3*c^2 -
 2*a^3*b^2*c*d + a^4*b*d^2 + (b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*x^2 + 2*
(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^3,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^3, x)
```

3.170 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^4}\,dx$

Optimal. Leaf size=611

$$-\frac{2b^2B^2n^2(c+dx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{9(a+bx)^3(bc-ad)^3}-\frac{b^2Bn(c+dx)^3\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{3(a+bx)^3(bc-ad)^3}-\frac{b^2(c+dx)}{}$$

```
[Out] (-6*B^3*d^2*n^3*(c + d*x))/((b*c - a*d)^3*(a + b*x)) + (3*b*B^3*d*n^3*(c +
d*x)^2)/(4*(b*c - a*d)^3*(a + b*x)^2) - (2*b^2*B^3*n^3*(c + d*x)^3)/(27*(b*
c - a*d)^3*(a + b*x)^3) - (6*B^2*d^2*n^2*(c + d*x)*(A + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n]))/((b*c - a*d)^3*(a + b*x)) + (3*b*B^2*d*n^2*(c + d*x)^2*(A
 + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*(b*c - a*d)^3*(a + b*x)^2) - (2*
b^2*B^2*n^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(9*(b*c -
 a*d)^3*(a + b*x)^3) - (3*B*d^2*n*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n])^2)/((b*c - a*d)^3*(a + b*x)) + (3*b*B*d*n*(c + d*x)^2*(A + B*Log[
(e*(a + b*x)^n)/(c + d*x)^n])^2)/(2*(b*c - a*d)^3*(a + b*x)^2) - (b^2*B*n*(
c + d*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(3*(b*c - a*d)^3*(a
+ b*x)^3) - (d^2*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/((b*
c - a*d)^3*(a + b*x)) + (b*d*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*
x)^n])^3)/((b*c - a*d)^3*(a + b*x)^2) - (b^2*(c + d*x)^3*(A + B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])^3)/(3*(b*c - a*d)^3*(a + b*x)^3)
```

Rubi [C] time = 3.43242, antiderivative size = 1876, normalized size of antiderivative = 3.07, number of steps used = 66, number of rules used = 16, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.485, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315, 2491, 2509, 37, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^4,x]
```

```
[Out] -A^3/(3*b*(a + b*x)^3) - (A^2*B*n)/(3*b*(a + b*x)^3) - (2*A*B^2*n^2)/(9*b*(
a + b*x)^3) - (2*B^3*n^3)/(27*b*(a + b*x)^3) + (A^2*B*d*n)/(2*b*(b*c - a*d)
*(a + b*x)^2) + (5*A*B^2*d*n^2)/(6*b*(b*c - a*d)*(a + b*x)^2) + (5*B^3*d*n^
3)/(18*b*(b*c - a*d)*(a + b*x)^2) - (A^2*B*d^2*n)/(b*(b*c - a*d)^2*(a + b*x
)) - (11*A*B^2*d^2*n^2)/(3*b*(b*c - a*d)^2*(a + b*x)) - (47*B^3*d^2*n^3)/(9
*b*(b*c - a*d)^2*(a + b*x)) + (b*B^3*d*n^3*(c + d*x)^2)/(4*(b*c - a*d)^3*(a
 + b*x)^2) - (A^2*B*d^3*n*Log[a + b*x])/(b*(b*c - a*d)^3) - (5*A*B^2*d^3*n^
2*Log[a + b*x])/(3*b*(b*c - a*d)^3) - (5*B^3*d^3*n^3*Log[a + b*x])/(9*b*(b*
```

```
c - a*d)^3) + (A^2*B*d^3*n*Log[c + d*x])/(b*(b*c - a*d)^3) + (5*A*B^2*d^3*n
^2*Log[c + d*x])/(3*b*(b*c - a*d)^3) + (5*B^3*d^3*n^3*Log[c + d*x])/(9*b*(b
*c - a*d)^3) - (A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*(a + b*x)^3) - (
2*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(a + b*x)^3) - (2*B^3*n^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n])/(9*b*(a + b*x)^3) + (A*B^2*d*n*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(b*(b*c - a*d)*(a + b*x)^2) + (B^3*d*n^2*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)*(a + b*x)^2) - (2*A*B^2*d^2*n*(c +
 d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*c - a*d)^3*(a + b*x)) - (14*B^3
*d^2*n^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*(b*c - a*d)^3*(a +
b*x)) + (b*B^3*d*n^2*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*(b*c
- a*d)^3*(a + b*x)^2) + (2*A*B^2*d^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n])/(b*(b*c - a*d)^3) + (2*B^3*d^3*n^2*Log[-((b
*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d
)^3) - (2*A*B^2*d^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^2*Log[(b*c - a*d)/(b*(c + d*x)
)]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b*(b*c - a*d)^3) - (A*B^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^2)/(b*(a + b*x)^3) - (B^3*n*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]^2)/(3*b*(a + b*x)^3) - (2*B^3*d^2*n*(c + d*x)*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2)/((b*c - a*d)^3*(a + b*x)) + (b*B^3*d*n*(c + d*x)^2*Log[(e*
(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*c - a*d)^3*(a + b*x)^2) + (B^3*d^3*n*Log
[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b*(b*c
- a*d)^3) - (B^3*d^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(
c + d*x)^n]^2)/(b*(b*c - a*d)^3) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)
/(3*b*(a + b*x)^3) - (2*A*B^2*d^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x)
)])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x
))])/(3*b*(b*c - a*d)^3) - (2*A*B^2*d^3*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(
a + b*x))])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^3*PolyLog[2, 1 + (b*c - a*d)/(
d*(a + b*x))])/(3*b*(b*c - a*d)^3) - (2*B^3*d^3*n^2*Log[(e*(a + b*x)^n)/(c
+ d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*(b*c - a*d)^3) - (2
*B^3*d^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b
*(c + d*x))])/(b*(b*c - a*d)^3) - (2*B^3*d^3*n^3*PolyLog[3, 1 + (b*c - a*d)
/(d*(a + b*x))])/(b*(b*c - a*d)^3) + (2*B^3*d^3*n^3*PolyLog[3, 1 - (b*c - a
*d)/(b*(c + d*x))])/(b*(b*c - a*d)^3)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
```

```
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^4}\,dx = \int\left(\frac{A^3}{(a+bx)^4} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4} + \frac{3AB^2\log^2(e(a+bx)^n(c\ldots}{(a+bx)^4}\right.$$

$$= -\frac{A^3}{3b(a+bx)^3} + \left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^4}\,dx + \left(3AB^2\right)\int \frac{\log^2(\ldots}{}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2B\log(e(a+bx)^n(c+dx)^{-n})}{b(a+bx)^3} - \frac{AB^2\log^2(e(a+bx)^n(c+d\ldots}{b(a+bx)^3}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2B\log(e(a+bx)^n(c+dx)^{-n})}{b(a+bx)^3} - \frac{AB^2\log^2(e(a+bx)^n(c+d\ldots}{b(a+bx)^3}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+bx)^2} - \frac{A^2Bd^2n}{b(bc-ad)^2(a+bx)} - \ldots$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+bx)^2} - \frac{A^2Bd^2n}{b(bc-ad)^2(a+bx)} - \ldots$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+bx)^2} - \frac{A^2Bd^2n}{b(bc-ad)^2(a+bx)} - \ldots$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} - \frac{2AB^2n^2}{9b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+bx)^2} + \frac{5\ldots}{6b(bc-\ldots}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} - \frac{2AB^2n^2}{9b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+bx)^2} + \frac{5\ldots}{6b(bc-\ldots}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} - \frac{2AB^2n^2}{9b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+bx)^2} + \frac{5\ldots}{6b(bc-\ldots}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} - \frac{2AB^2n^2}{9b(a+bx)^3} - \frac{2B^3n^3}{27b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+\ldots}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} - \frac{2AB^2n^2}{9b(a+bx)^3} - \frac{2B^3n^3}{27b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+\ldots}$$

$$= -\frac{A^3}{3b(a+bx)^3} - \frac{A^2Bn}{3b(a+bx)^3} - \frac{2AB^2n^2}{9b(a+bx)^3} - \frac{2B^3n^3}{27b(a+bx)^3} + \frac{A^2Bdn}{2b(bc-ad)(a+\ldots}$$

Mathematica [A] time = 1.47614, size = 1003, normalized size = 1.64

$$-36B^3d^3n^3\log^3(a+bx)(a+bx)^3+36B^3d^3n^3\log^3(c+dx)(a+bx)^3+18B^2d^3n^2\log^2(c+dx)\left(6A+11Bn+6B\log\left(e(a\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^4,x]
```

```
[Out] (-36*B^3*d^3*n^3*(a + b*x)^3*Log[a + b*x]^3 + 36*B^3*d^3*n^3*(a + b*x)^3*Lo
g[c + d*x]^3 + 18*B^2*d^3*n^2*(a + b*x)^3*Log[c + d*x]^2*(6*A + 11*B*n + 6*
B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 18*B^2*d^3*n^2*(a + b*x)^3*Log[a + b*
x]^2*(6*A + 11*B*n + 6*B*n*Log[c + d*x] + 6*B*Log[(e*(a + b*x)^n)/(c + d*x)
^n]) + 6*B*d^3*n*(a + b*x)^3*Log[c + d*x]*(18*A^2 + 66*A*B*n + 85*B^2*n^2 +
 6*B*(6*A + 11*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B^2*Log[(e*(a + b
*x)^n)/(c + d*x)^n]^2) - (b*c - a*d)*(36*A^3*b^2*c^2 - 72*a*A^3*b*c*d + 36*
a^2*A^3*d^2 + 36*A^2*b^2*B*c^2*n - 126*a*A^2*b*B*c*d*n + 198*a^2*A^2*B*d^2*
n + 24*A*b^2*B^2*c^2*n^2 - 138*a*A*b*B^2*c*d*n^2 + 510*a^2*A*B^2*d^2*n^2 +
8*b^2*B^3*c^2*n^3 - 73*a*b*B^3*c*d*n^3 + 575*a^2*B^3*d^2*n^3 - 54*A^2*b^2*B
*c*d*n*x + 270*a*A^2*b*B*d^2*n*x - 90*A*b^2*B^2*c*d*n^2*x + 882*a*A*b*B^2*d
^2*n^2*x - 57*b^2*B^3*c*d*n^3*x + 1077*a*b*B^3*d^2*n^3*x + 108*A^2*b^2*B*d^
2*n*x^2 + 396*A*b^2*B^2*d^2*n^2*x^2 + 510*b^2*B^3*d^2*n^3*x^2 + 6*B*(18*A^2
*(b*c - a*d)^2 + 6*A*B*n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 -
 3*c*d*x + 6*d^2*x^2)) + B^2*n^2*(85*a^2*d^2 + a*b*d*(-23*c + 147*d*x) + b^
2*(4*c^2 - 15*c*d*x + 66*d^2*x^2)))*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B
^2*(6*A*(b*c - a*d)^2 + B*n*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^
2 - 3*c*d*x + 6*d^2*x^2)))*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 36*B^3*(b*c
 - a*d)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3) - 6*B*d^3*n*(a + b*x)^3*Log[a
 + b*x]*(18*A^2 + 66*A*B*n + 85*B^2*n^2 + 18*B^2*n^2*Log[c + d*x]^2 + 6*B*(
6*A + 11*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 18*B^2*Log[(e*(a + b*x)^n)
/(c + d*x)^n]^2 + 6*B*n*Log[c + d*x]*(6*A + 11*B*n + 6*B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])))/(108*b*(b*c - a*d)^3*(a + b*x)^3)
```

Maple [C] time = 27.216, size = 175812, normalized size = 287.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 2.60012, size = 4901, normalized size = 8.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x, algorithm="maxi
ma")
```

```
[Out] -1/3*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^
2*x + a^3*b) - 1/108*(18*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d +
 3*a^2*b^2*c*d^2 - a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c
^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n -
7*a*b*c*d*e*n + 11*a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^
3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x
^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a
^3*b^3*c*d + a^4*b^2*d^2)*x))*log((b*x + a)^n*e/(d*x + c)^n)^2/e + (6*(4*b^
3*c^3*e^2*n^2 - 27*a*b^2*c^2*d*e^2*n^2 + 108*a^2*b*c*d^2*e^2*n^2 - 85*a^3*d
^3*e^2*n^2 + 66*(b^3*c*d^2*e^2*n^2 - a*b^2*d^3*e^2*n^2)*x^2 - 18*(b^3*d^3*e
^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*
n^2)*log(b*x + a)^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3
*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(d*x + c)^2 - 3*(5*b^3*c^2*d*e^2
*n^2 - 54*a*b^2*c*d^2*e^2*n^2 + 49*a^2*b*d^3*e^2*n^2)*x + 66*(b^3*d^3*e^2*n
^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)
*log(b*x + a) - 6*(11*b^3*d^3*e^2*n^2*x^3 + 33*a*b^2*d^3*e^2*n^2*x^2 + 33*a
^2*b*d^3*e^2*n^2*x + 11*a^3*d^3*e^2*n^2 - 6*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*
d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a))*lo
g(d*x + c))*log((b*x + a)^n*e/(d*x + c)^n)/((a^3*b^4*c^3 - 3*a^4*b^3*c^2*d
+ 3*a^5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2
- a^3*b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4
*b^3*d^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^
2*d^3)*x)*e) + (8*b^3*c^3*e^3*n^3 - 81*a*b^2*c^2*d*e^3*n^3 + 648*a^2*b*c*d^
2*e^3*n^3 - 575*a^3*d^3*e^3*n^3 + 36*(b^3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3
*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*e^3*n^3)*log(b*x + a)^3 - 36*(b^
3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d
^3*e^3*n^3)*log(d*x + c)^3 + 510*(b^3*c*d^2*e^3*n^3 - a*b^2*d^3*e^3*n^3)*x^
2 - 198*(b^3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^
3*x + a^3*d^3*e^3*n^3)*log(b*x + a)^2 - 18*(11*b^3*d^3*e^3*n^3*x^3 + 33*a*b
^2*d^3*e^3*n^3*x^2 + 33*a^2*b*d^3*e^3*n^3*x + 11*a^3*d^3*e^3*n^3 - 6*(b^3*d
^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*
```

```
e^3*n^3)*log(b*x + a))*log(d*x + c)^2 - 3*(19*b^3*c^2*d*e^3*n^3 - 378*a*b^2
*c*d^2*e^3*n^3 + 359*a^2*b*d^3*e^3*n^3)*x + 510*(b^3*d^3*e^3*n^3*x^3 + 3*a*
b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*e^3*n^3)*log(b*x + a)
 - 6*(85*b^3*d^3*e^3*n^3*x^3 + 255*a*b^2*d^3*e^3*n^3*x^2 + 255*a^2*b*d^3*e^
3*n^3*x + 85*a^3*d^3*e^3*n^3 + 18*(b^3*d^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^
3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*e^3*n^3)*log(b*x + a)^2 - 66*(b^3*d
^3*e^3*n^3*x^3 + 3*a*b^2*d^3*e^3*n^3*x^2 + 3*a^2*b*d^3*e^3*n^3*x + a^3*d^3*
e^3*n^3)*log(b*x + a))*log(d*x + c))/((a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^
5*b^2*c*d^2 - a^6*b*d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*
b^4*d^3)*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d
^3)*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)
*x)*e^2))/e)*B^3 - 1/18*A*B^2*(6*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3
*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3
*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^
2*e*n - 7*a*b*c*d*e*n + 11*a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)
/(a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^
4*d^2)*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c
^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*x))*log((b*x + a)^n*e/(d*x + c)^n)/e + (4
*b^3*c^3*e^2*n^2 - 27*a*b^2*c^2*d*e^2*n^2 + 108*a^2*b*c*d^2*e^2*n^2 - 85*a^
3*d^3*e^2*n^2 + 66*(b^3*c*d^2*e^2*n^2 - a*b^2*d^3*e^2*n^2)*x^2 - 18*(b^3*d^
3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e
^2*n^2)*log(b*x + a)^2 - 18*(b^3*d^3*e^2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2
+ 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(d*x + c)^2 - 3*(5*b^3*c^2*d*
e^2*n^2 - 54*a*b^2*c*d^2*e^2*n^2 + 49*a^2*b*d^3*e^2*n^2)*x + 66*(b^3*d^3*e^
2*n^2*x^3 + 3*a*b^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n
^2)*log(b*x + a) - 6*(11*b^3*d^3*e^2*n^2*x^3 + 33*a*b^2*d^3*e^2*n^2*x^2 + 3
3*a^2*b*d^3*e^2*n^2*x + 11*a^3*d^3*e^2*n^2 - 6*(b^3*d^3*e^2*n^2*x^3 + 3*a*b
^2*d^3*e^2*n^2*x^2 + 3*a^2*b*d^3*e^2*n^2*x + a^3*d^3*e^2*n^2)*log(b*x + a))
*log(d*x + c))/((a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^
3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*x^3 + 3*(a*b^
6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*x^2 + 3*(a^2*b^5*c
^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*x)*e^2)) - A*B^2*log(
(b*x + a)^n*e/(d*x + c)^n)^2/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x + a^3*b)
- 1/6*(6*d^3*e*n*log(b*x + a)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 -
a^3*b*d^3) - 6*d^3*e*n*log(d*x + c)/(b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*
d^2 - a^3*b*d^3) + (6*b^2*d^2*e*n*x^2 + 2*b^2*c^2*e*n - 7*a*b*c*d*e*n + 11*
a^2*d^2*e*n - 3*(b^2*c*d*e*n - 5*a*b*d^2*e*n)*x)/(a^3*b^3*c^2 - 2*a^4*b^2*c
*d + a^5*b*d^2 + (b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*x^3 + 3*(a*b^5*c^2 -
 2*a^2*b^4*c*d + a^3*b^3*d^2)*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^
2*d^2)*x))*A^2*B/e - A^2*B*log((b*x + a)^n*e/(d*x + c)^n)/(b^4*x^3 + 3*a*b^
3*x^2 + 3*a^2*b^2*x + a^3*b) - 1/3*A^3/(b^4*x^3 + 3*a*b^3*x^2 + 3*a^2*b^2*x
 + a^3*b)
```

Fricas [B] time = 1.86161, size = 8181, normalized size = 13.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x, algorithm="fric
as")
```

```
[Out] -1/108*(36*A^3*b^3*c^3 - 108*A^3*a*b^2*c^2*d + 108*A^3*a^2*b*c*d^2 - 36*A^3
*a^3*d^3 + (8*B^3*b^3*c^3 - 81*B^3*a*b^2*c^2*d + 648*B^3*a^2*b*c*d^2 - 575*
B^3*a^3*d^3)*n^3 + 36*(B^3*b^3*d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*B^
3*a^2*b*d^3*n^3*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n
^3)*log(b*x + a)^3 - 36*(B^3*b^3*d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*
B^3*a^2*b*d^3*n^3*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)
*n^3)*log(d*x + c)^3 + 36*(B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*
d^2 - B^3*a^3*d^3)*log(e)^3 + 6*(4*A*B^2*b^3*c^3 - 27*A*B^2*a*b^2*c^2*d + 1
08*A*B^2*a^2*b*c*d^2 - 85*A*B^2*a^3*d^3)*n^2 + 6*(85*(B^3*b^3*c*d^2 - B^3*a
*b^2*d^3)*n^3 + 66*(A*B^2*b^3*c*d^2 - A*B^2*a*b^2*d^3)*n^2 + 18*(A^2*B*b^3*
c*d^2 - A^2*B*a*b^2*d^3)*n)*x^2 + 18*((2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d +
18*B^3*a^2*b*c*d^2)*n^3 + (11*B^3*b^3*d^3*n^3 + 6*A*B^2*b^3*d^3*n^2)*x^3 +
6*(A*B^2*b^3*c^3 - 3*A*B^2*a*b^2*c^2*d + 3*A*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*
B^2*a*b^2*d^3*n^2 + (2*B^3*b^3*c*d^2 + 9*B^3*a*b^2*d^3)*n^3)*x^2 + 3*(6*A*B
^2*a^2*b*d^3*n^2 - (B^3*b^3*c^2*d - 6*B^3*a*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^
3)*x + 6*(B^3*b^3*d^3*n^2*x^3 + 3*B^3*a*b^2*d^3*n^2*x^2 + 3*B^3*a^2*b*d^3*n
^2*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^2)*log(e))*l
og(b*x + a)^2 + 18*((2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d + 18*B^3*a^2*b*c*d^2
)*n^3 + (11*B^3*b^3*d^3*n^3 + 6*A*B^2*b^3*d^3*n^2)*x^3 + 6*(A*B^2*b^3*c^3 -
 3*A*B^2*a*b^2*c^2*d + 3*A*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n^2
+ (2*B^3*b^3*c*d^2 + 9*B^3*a*b^2*d^3)*n^3)*x^2 + 3*(6*A*B^2*a^2*b*d^3*n^2 -
 (B^3*b^3*c^2*d - 6*B^3*a*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^3)*x + 6*(B^3*b^3*
d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*B^3*a^2*b*d^3*n^3*x + (B^3*b^3*c^
3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^3)*log(b*x + a) + 6*(B^3*b^3*d
^3*n^2*x^3 + 3*B^3*a*b^2*d^3*n^2*x^2 + 3*B^3*a^2*b*d^3*n^2*x + (B^3*b^3*c^3
 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^2)*log(e))*log(d*x + c)^2 + 18*
(6*A*B^2*b^3*c^3 - 18*A*B^2*a*b^2*c^2*d + 18*A*B^2*a^2*b*c*d^2 - 6*A*B^2*a^
3*d^3 + 6*(B^3*b^3*c*d^2 - B^3*a*b^2*d^3)*n*x^2 - 3*(B^3*b^3*c^2*d - 6*B^3*
a*b^2*c*d^2 + 5*B^3*a^2*b*d^3)*n*x + (2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d + 1
8*B^3*a^2*b*c*d^2 - 11*B^3*a^3*d^3)*n)*log(e)^2 + 18*(2*A^2*B*b^3*c^3 - 9*A
^2*B*a*b^2*c^2*d + 18*A^2*B*a^2*b*c*d^2 - 11*A^2*B*a^3*d^3)*n - 3*((19*B^3*
b^3*c^2*d - 378*B^3*a*b^2*c*d^2 + 359*B^3*a^2*b*d^3)*n^3 + 6*(5*A*B^2*b^3*c
^2*d - 54*A*B^2*a*b^2*c*d^2 + 49*A*B^2*a^2*b*d^3)*n^2 + 18*(A^2*B*b^3*c^2*d
 - 6*A^2*B*a*b^2*c*d^2 + 5*A^2*B*a^2*b*d^3)*n)*x + 6*((4*B^3*b^3*c^3 - 27*B
^3*a*b^2*c^2*d + 108*B^3*a^2*b*c*d^2)*n^3 + (85*B^3*b^3*d^3*n^3 + 66*A*B^2*
```

b^3*d^3*n^2 + 18*A^2*B*b^3*d^3*n)*x^3 + 6*(2*A*B^2*b^3*c^3 - 9*A*B^2*a*b^2*
c^2*d + 18*A*B^2*a^2*b*c*d^2)*n^2 + 3*(18*A^2*B*a*b^2*d^3*n + (22*B^3*b^3*c
*d^2 + 63*B^3*a*b^2*d^3)*n^3 + 6*(2*A*B^2*b^3*c*d^2 + 9*A*B^2*a*b^2*d^3)*n^
2)*x^2 + 18*(B^3*b^3*d^3*n*x^3 + 3*B^3*a*b^2*d^3*n*x^2 + 3*B^3*a^2*b*d^3*n*
x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n)*log(e)^2 + 18*
(A^2*B*b^3*c^3 - 3*A^2*B*a*b^2*c^2*d + 3*A^2*B*a^2*b*c*d^2)*n + 3*(18*A^2*B
*a^2*b*d^3*n - (5*B^3*b^3*c^2*d - 54*B^3*a*b^2*c*d^2 - 36*B^3*a^2*b*d^3)*n^
3 - 6*(A*B^2*b^3*c^2*d - 6*A*B^2*a*b^2*c*d^2 - 6*A*B^2*a^2*b*d^3)*n^2)*x +
6*((11*B^3*b^3*d^3*n^2 + 6*A*B^2*b^3*d^3*n)*x^3 + (2*B^3*b^3*c^3 - 9*B^3*a*
b^2*c^2*d + 18*B^3*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n + (2*B^3*b^3*c
*d^2 + 9*B^3*a*b^2*d^3)*n^2)*x^2 + 6*(A*B^2*b^3*c^3 - 3*A*B^2*a*b^2*c^2*d +
 3*A*B^2*a^2*b*c*d^2)*n + 3*(6*A*B^2*a^2*b*d^3*n - (B^3*b^3*c^2*d - 6*B^3*a
*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^2)*x)*log(e))*log(b*x + a) - 6*((4*B^3*b^3*
c^3 - 27*B^3*a*b^2*c^2*d + 108*B^3*a^2*b*c*d^2)*n^3 + (85*B^3*b^3*d^3*n^3 +
 66*A*B^2*b^3*d^3*n^2 + 18*A^2*B*b^3*d^3*n)*x^3 + 6*(2*A*B^2*b^3*c^3 - 9*A*
B^2*a*b^2*c^2*d + 18*A*B^2*a^2*b*c*d^2)*n^2 + 3*(18*A^2*B*a*b^2*d^3*n + (22
*B^3*b^3*c*d^2 + 63*B^3*a*b^2*d^3)*n^3 + 6*(2*A*B^2*b^3*c*d^2 + 9*A*B^2*a*b
^2*d^3)*n^2)*x^2 + 18*(B^3*b^3*d^3*n^3*x^3 + 3*B^3*a*b^2*d^3*n^3*x^2 + 3*B^
3*a^2*b*d^3*n^3*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n
^3)*log(b*x + a)^2 + 18*(B^3*b^3*d^3*n*x^3 + 3*B^3*a*b^2*d^3*n*x^2 + 3*B^3*
a^2*b*d^3*n*x + (B^3*b^3*c^3 - 3*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n)*lo
g(e)^2 + 18*(A^2*B*b^3*c^3 - 3*A^2*B*a*b^2*c^2*d + 3*A^2*B*a^2*b*c*d^2)*n +
 3*(18*A^2*B*a^2*b*d^3*n - (5*B^3*b^3*c^2*d - 54*B^3*a*b^2*c*d^2 - 36*B^3*a
^2*b*d^3)*n^3 - 6*(A*B^2*b^3*c^2*d - 6*A*B^2*a*b^2*c*d^2 - 6*A*B^2*a^2*b*d^
3)*n^2)*x + 6*((2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d + 18*B^3*a^2*b*c*d^2)*n^3
 + (11*B^3*b^3*d^3*n^3 + 6*A*B^2*b^3*d^3*n^2)*x^3 + 6*(A*B^2*b^3*c^3 - 3*A*
B^2*a*b^2*c^2*d + 3*A*B^2*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n^2 + (2*
B^3*b^3*c*d^2 + 9*B^3*a*b^2*d^3)*n^3)*x^2 + 3*(6*A*B^2*a^2*b*d^3*n^2 - (B^3
*b^3*c^2*d - 6*B^3*a*b^2*c*d^2 - 6*B^3*a^2*b*d^3)*n^3)*x + 6*(B^3*b^3*d^3*n
^2*x^3 + 3*B^3*a*b^2*d^3*n^2*x^2 + 3*B^3*a^2*b*d^3*n^2*x + (B^3*b^3*c^3 - 3
*B^3*a*b^2*c^2*d + 3*B^3*a^2*b*c*d^2)*n^2)*log(e))*log(b*x + a) + 6*((11*B^
3*b^3*d^3*n^2 + 6*A*B^2*b^3*d^3*n)*x^3 + (2*B^3*b^3*c^3 - 9*B^3*a*b^2*c^2*d
 + 18*B^3*a^2*b*c*d^2)*n^2 + 3*(6*A*B^2*a*b^2*d^3*n + (2*B^3*b^3*c*d^2 + 9*
B^3*a*b^2*d^3)*n^2)*x^2 + 6*(A*B^2*b^3*c^3 - 3*A*B^2*a*b^2*c^2*d + 3*A*B^2*
a^2*b*c*d^2)*n + 3*(6*A*B^2*a^2*b*d^3*n - (B^3*b^3*c^2*d - 6*B^3*a*b^2*c*d^
2 - 6*B^3*a^2*b*d^3)*n^2)*x)*log(e))*log(d*x + c) + 6*(18*A^2*B*b^3*c^3 - 5
4*A^2*B*a*b^2*c^2*d + 54*A^2*B*a^2*b*c*d^2 - 18*A^2*B*a^3*d^3 + (4*B^3*b^3*
c^3 - 27*B^3*a*b^2*c^2*d + 108*B^3*a^2*b*c*d^2 - 85*B^3*a^3*d^3)*n^2 + 6*(1
1*(B^3*b^3*c*d^2 - B^3*a*b^2*d^3)*n^2 + 6*(A*B^2*b^3*c*d^2 - A*B^2*a*b^2*d^
3)*n)*x^2 + 6*(2*A*B^2*b^3*c^3 - 9*A*B^2*a*b^2*c^2*d + 18*A*B^2*a^2*b*c*d^2
 - 11*A*B^2*a^3*d^3)*n - 3*((5*B^3*b^3*c^2*d - 54*B^3*a*b^2*c*d^2 + 49*B^3*
a^2*b*d^3)*n^2 + 6*(A*B^2*b^3*c^2*d - 6*A*B^2*a*b^2*c*d^2 + 5*A*B^2*a^2*b*d
^3)*n)*x)*log(e))/(a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*
d^3 + (b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*x^3 + 3*(a*
b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*x^2 + 3*(a^2*b^5

```
*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)^{3}}{(bx+a)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^4,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^4, x)
```

3.171 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^5}\,dx$

Optimal. Leaf size=830

$$-\frac{b^3\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3(c+dx)^4}{4(bc-ad)^4(a+bx)^4}-\frac{3b^3Bn\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2(c+dx)^4}{16(bc-ad)^4(a+bx)^4}-\frac{3b^3B^2n^2\left(A+\right.}{}$$

```
[Out] (6*B^3*d^3*n^3*(c + d*x))/((b*c - a*d)^4*(a + b*x)) - (9*b*B^3*d^2*n^3*(c +
 d*x)^2)/(8*(b*c - a*d)^4*(a + b*x)^2) + (2*b^2*B^3*d*n^3*(c + d*x)^3)/(9*(
b*c - a*d)^4*(a + b*x)^3) - (3*b^3*B^3*n^3*(c + d*x)^4)/(128*(b*c - a*d)^4*
(a + b*x)^4) + (6*B^2*d^3*n^2*(c + d*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x
)^n]))/((b*c - a*d)^4*(a + b*x)) - (9*b*B^2*d^2*n^2*(c + d*x)^2*(A + B*Log[
(e*(a + b*x)^n)/(c + d*x)^n]))/(4*(b*c - a*d)^4*(a + b*x)^2) + (2*b^2*B^2*d
*n^2*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(3*(b*c - a*d)^4
*(a + b*x)^3) - (3*b^3*B^2*n^2*(c + d*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n]))/(32*(b*c - a*d)^4*(a + b*x)^4) + (3*B*d^3*n*(c + d*x)*(A + B*Log[
(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*c - a*d)^4*(a + b*x)) - (9*b*B*d^2*n*(
c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(4*(b*c - a*d)^4*(a
+ b*x)^2) + (b^2*B*d*n*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])
^2)/((b*c - a*d)^4*(a + b*x)^3) - (3*b^3*B*n*(c + d*x)^4*(A + B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])^2)/(16*(b*c - a*d)^4*(a + b*x)^4) + (d^3*(c + d*x)*(
A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/((b*c - a*d)^4*(a + b*x)) - (3*b
*d^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(2*(b*c - a*d)
^4*(a + b*x)^2) + (b^2*d*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n
])^3)/((b*c - a*d)^4*(a + b*x)^3) - (b^3*(c + d*x)^4*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])^3)/(4*(b*c - a*d)^4*(a + b*x)^4)
```

Rubi [C] time = 4.67497, antiderivative size = 2173, normalized size of antiderivative = 2.62, number of steps used = 93, number of rules used = 16, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.485, Rules used = {6742, 2492, 44, 2514, 2490, 32, 2488, 2411, 2343, 2333, 2315, 2491, 2509, 37, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^5,x]
```

```
[Out] -A^3/(4*b*(a + b*x)^4) - (3*A^2*B*n)/(16*b*(a + b*x)^4) - (3*A*B^2*n^2)/(32
*b*(a + b*x)^4) - (3*B^3*n^3)/(128*b*(a + b*x)^4) + (A^2*B*d*n)/(4*b*(b*c -
 a*d)*(a + b*x)^3) + (7*A*B^2*d*n^2)/(24*b*(b*c - a*d)*(a + b*x)^3) + (37*B
```

^3*d*n^3)/(288*b*(b*c - a*d)*(a + b*x)^3) - (3*A^2*B*d^2*n)/(8*b*(b*c - a*d)^2*(a + b*x)^2) - (13*A*B^2*d^2*n^2)/(16*b*(b*c - a*d)^2*(a + b*x)^2) - (79*B^3*d^2*n^3)/(192*b*(b*c - a*d)^2*(a + b*x)^2) + (3*A^2*B*d^3*n)/(4*b*(b*c - a*d)^3*(a + b*x)) + (25*A*B^2*d^3*n^2)/(8*b*(b*c - a*d)^3*(a + b*x)) + (451*B^3*d^3*n^3)/(96*b*(b*c - a*d)^3*(a + b*x)) - (3*b*B^3*d^2*n^3*(c + d*x)^2)/(16*(b*c - a*d)^4*(a + b*x)^2) + (3*A^2*B*d^4*n*Log[a + b*x])/(4*b*(b*c - a*d)^4) + (13*A*B^2*d^4*n^2*Log[a + b*x])/(8*b*(b*c - a*d)^4) + (79*B^3*d^4*n^3*Log[a + b*x])/(96*b*(b*c - a*d)^4) - (3*A^2*B*d^4*n*Log[c + d*x])/(4*b*(b*c - a*d)^4) - (13*A*B^2*d^4*n^2*Log[c + d*x])/(8*b*(b*c - a*d)^4) - (79*B^3*d^4*n^3*Log[c + d*x])/(96*b*(b*c - a*d)^4) - (3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*(a + b*x)^4) - (3*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(a + b*x)^4) - (3*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(32*b*(a + b*x)^4) + (A*B^2*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)*(a + b*x)^3) + (7*B^3*d*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(24*b*(b*c - a*d)*(a + b*x)^3) - (3*A*B^2*d^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*b*(b*c - a*d)^2*(a + b*x)^2) - (7*B^3*d^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(16*b*(b*c - a*d)^2*(a + b*x)^2) + (3*A*B^2*d^3*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*(b*c - a*d)^4*(a + b*x)) + (31*B^3*d^3*n^2*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*(b*c - a*d)^4*(a + b*x)) - (3*b*B^3*d^2*n^2*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*(b*c - a*d)^4*(a + b*x)^2) - (3*A*B^2*d^4*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) - (7*B^3*d^4*n^2*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(b*c - a*d)^4) + (3*A*B^2*d^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*b*(b*c - a*d)^4) + (7*B^3*d^4*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(8*b*(b*c - a*d)^4) - (3*A*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(a + b*x)^4) - (3*B^3*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(16*b*(a + b*x)^4) + (B^3*d*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(b*c - a*d)*(a + b*x)^3) + (3*B^3*d^3*n*(c + d*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*c - a*d)^4*(a + b*x)) - (3*b*B^3*d^2*n*(c + d*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(8*(b*c - a*d)^4*(a + b*x)^2) - (3*B^3*d^4*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(b*c - a*d)^4) + (3*B^3*d^4*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(4*b*(b*c - a*d)^4) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(4*b*(a + b*x)^4) + (3*A*B^2*d^4*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b*(b*c - a*d)^4) + (7*B^3*d^4*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(8*b*(b*c - a*d)^4) + (3*A*B^2*d^4*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(2*b*(b*c - a*d)^4) + (7*B^3*d^4*n^3*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(8*b*(b*c - a*d)^4) + (3*B^3*d^4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(2*b*(b*c - a*d)^4) + (3*B^3*d^4*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*(b*c - a*d)^4) + (3*B^3*d^4*n^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(2*b*(b*c - a*d)^4) - (3*B^3*d^4*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(2*b*(b*c - a*d)^4)

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2491

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_))^3, x_Symbol] :> Dist[d/(d*g - c*h), Int[L
og[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/(g + h*x)^2, x], x] - Dist[h/(d*g - c
*h), Int[((c + d*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(g + h*x)^3, x]
, x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0]
 && EqQ[p + q, 0] && EqQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 0]
```

Rule 2509

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symb
ol] :> Simp[((a + b*x)^(m + 1)*(c + d*x)^(n + 1)*Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^s)/((m + 1)*(b*c - a*d)), x] - Dist[(p*r*s*(b*c - a*d))/((m + 1)
*(b*c - a*d)), Int[(a + b*x)^m*(c + d*x)^n*Log[e*(f*(a + b*x)^p*(c + d*x)^q
)^r]^(s - 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p, q, r, s}, x] && N
eQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ[m + n + 2, 0] && NeQ[m, -1] && IGt
Q[s, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(a+bx)^5}\,dx = \int\left(\frac{A^3}{(a+bx)^5} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^5} + \frac{3AB^2\log^2(e(a+bx)^n(c-\right.$$

$$= -\frac{A^3}{4b(a+bx)^4} + \left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(a+bx)^5}\,dx + \left(3AB^2\right)\int \frac{\log^2(e}{}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{4b(a+bx)^4} - \frac{3AB^2\log^2(e(a+bx)^n(c+}{4b(a+bx)^4}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{4b(a+bx)^4} - \frac{3AB^2\log^2(e(a+bx)^n(c+}{4b(a+bx)^4}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} + \frac{A^2Bdn}{4b(bc-ad)(a+bx)^3} - \frac{3A^2Bd^2n}{8b(bc-ad)^2(a+bx)^2}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} + \frac{A^2Bdn}{4b(bc-ad)(a+bx)^3} - \frac{3A^2Bd^2n}{8b(bc-ad)^2(a+bx)^2}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} + \frac{A^2Bdn}{4b(bc-ad)(a+bx)^3} - \frac{3A^2Bd^2n}{8b(bc-ad)^2(a+bx)^2}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} - \frac{3AB^2n^2}{32b(a+bx)^4} + \frac{A^2Bdn}{4b(bc-ad)(a+bx)^3} + \frac{}{24b(}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} - \frac{3AB^2n^2}{32b(a+bx)^4} + \frac{A^2Bdn}{4b(bc-ad)(a+bx)^3} + \frac{}{24b(}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} - \frac{3AB^2n^2}{32b(a+bx)^4} + \frac{A^2Bdn}{4b(bc-ad)(a+bx)^3} + \frac{}{24b(}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} - \frac{3AB^2n^2}{32b(a+bx)^4} - \frac{3B^3n^3}{128b(a+bx)^4} + \frac{A^2Bd}{4b(bc-ad)(}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} - \frac{3AB^2n^2}{32b(a+bx)^4} - \frac{3B^3n^3}{128b(a+bx)^4} + \frac{A^2Bd}{4b(bc-ad)(}$$

$$= -\frac{A^3}{4b(a+bx)^4} - \frac{3A^2Bn}{16b(a+bx)^4} - \frac{3AB^2n^2}{32b(a+bx)^4} - \frac{3B^3n^3}{128b(a+bx)^4} + \frac{A^2Bd}{4b(bc-ad)(}$$

Mathematica [A] time = 2.251, size = 1370, normalized size = 1.65

$$-\frac{-288B^3d^4n^3\log^3(a+bx)(a+bx)^4+288B^3d^4n^3\log^3(c+dx)(a+bx)^4+72B^2d^4n^2\log^2(c+dx)\left(12A+25Bn+12B\log\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(a + b*x)^5,x]
```

```
[Out] -(-288*B^3*d^4*n^3*(a + b*x)^4*Log[a + b*x]^3 + 288*B^3*d^4*n^3*(a + b*x)^4
*Log[c + d*x]^3 + 72*B^2*d^4*n^2*(a + b*x)^4*Log[c + d*x]^2*(12*A + 25*B*n
+ 12*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + 72*B^2*d^4*n^2*(a + b*x)^4*Log[a
 + b*x]^2*(12*A + 25*B*n + 12*B*n*Log[c + d*x] + 12*B*Log[(e*(a + b*x)^n)/(
c + d*x)^n]) + 12*B*d^4*n*(a + b*x)^4*Log[c + d*x]*(72*A^2 + 300*A*B*n + 41
5*B^2*n^2 + 12*B*(12*A + 25*B*n)*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 72*B^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2) + (b*c - a*d)*(288*A^3*b^3*c^3 - 864*a*
A^3*b^2*c^2*d + 864*a^2*A^3*b*c*d^2 - 288*a^3*A^3*d^3 + 216*A^2*b^3*B*c^3*n
 - 936*a*A^2*b^2*B*c^2*d*n + 1656*a^2*A^2*b*B*c*d^2*n - 1800*a^3*A^2*B*d^3*
n + 108*A*b^3*B^2*c^3*n^2 - 660*a*A*b^2*B^2*c^2*d*n^2 + 1932*a^2*A*b*B^2*c*
d^2*n^2 - 4980*a^3*A*B^2*d^3*n^2 + 27*b^3*B^3*c^3*n^3 - 229*a*b^2*B^3*c^2*d
*n^3 + 1067*a^2*b*B^3*c*d^2*n^3 - 5845*a^3*B^3*d^3*n^3 - 288*A^2*b^3*B*c^2*
d*n*x + 1440*a*A^2*b^2*B*c*d^2*n*x - 3744*a^2*A^2*b*B*d^3*n*x - 336*A*b^3*B
^2*c^2*d*n^2*x + 2544*a*A*b^2*B^2*c*d^2*n^2*x - 13008*a^2*A*b*B^2*d^3*n^2*x
 - 148*b^3*B^3*c^2*d*n^3*x + 1676*a*b^2*B^3*c*d^2*n^3*x - 16468*a^2*b*B^3*d
^3*n^3*x + 432*A^2*b^3*B*c*d^2*n*x^2 - 3024*a*A^2*b^2*B*d^3*n*x^2 + 936*A*b
^3*B^2*c*d^2*n^2*x^2 - 11736*a*A*b^2*B^2*d^3*n^2*x^2 + 690*b^3*B^3*c*d^2*n^
3*x^2 - 15630*a*b^2*B^3*d^3*n^3*x^2 - 864*A^2*b^3*B*d^3*n*x^3 - 3600*A*b^3*
B^2*d^3*n^2*x^3 - 4980*b^3*B^3*d^3*n^3*x^3 + 12*B*(72*A^2*(b*c - a*d)^3 + B
^2*n^2*(-415*a^3*d^3 + a^2*b*d^2*(161*c - 1084*d*x) + a*b^2*d*(-55*c^2 + 21
2*c*d*x - 978*d^2*x^2) + b^3*(9*c^3 - 28*c^2*d*x + 78*c*d^2*x^2 - 300*d^3*x
^3)) + 12*A*B*n*(-25*a^3*d^3 + a^2*b*d^2*(23*c - 52*d*x) + a*b^2*d*(-13*c^2
 + 20*c*d*x - 42*d^2*x^2) + b^3*(3*c^3 - 4*c^2*d*x + 6*c*d^2*x^2 - 12*d^3*x
^3)))*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 72*B^2*(12*A*(b*c - a*d)^3 + B*n*(
-25*a^3*d^3 + a^2*b*d^2*(23*c - 52*d*x) + a*b^2*d*(-13*c^2 + 20*c*d*x - 42*
d^2*x^2) + b^3*(3*c^3 - 4*c^2*d*x + 6*c*d^2*x^2 - 12*d^3*x^3)))*Log[(e*(a +
 b*x)^n)/(c + d*x)^n]^2 + 288*B^3*(b*c - a*d)^3*Log[(e*(a + b*x)^n)/(c + d*
x)^n]^3) - 12*B*d^4*n*(a + b*x)^4*Log[a + b*x]*(72*A^2 + 300*A*B*n + 415*B^
2*n^2 + 72*B^2*n^2*Log[c + d*x]^2 + 12*B*(12*A + 25*B*n)*Log[(e*(a + b*x)^n
)/(c + d*x)^n] + 72*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + 12*B*n*Log[c +
 d*x]*(12*A + 25*B*n + 12*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])))/(1152*b*(b*
c - a*d)^4*(a + b*x)^4)
```

Maple [C] time = 33.085, size = 236754, normalized size = 285.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 3.30885, size = 7128, normalized size = 8.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x, algorithm="maxi
ma")
```

```
[Out] -1/4*B^3*log((b*x + a)^n*e/(d*x + c)^n)^3/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^
3*x^2 + 4*a^3*b^2*x + a^4*b) + 1/1152*(72*(12*d^4*e*n*log(b*x + a)/(b^5*c^4
 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^
4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2
*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*
e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*
e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4
*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b
^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^
2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d
 + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d +
3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*log((b*x + a)^n*e/(d*x + c)^n)^2/e - (12
*(9*b^4*c^4*e^2*n^2 - 64*a*b^3*c^3*d*e^2*n^2 + 216*a^2*b^2*c^2*d^2*e^2*n^2
- 576*a^3*b*c*d^3*e^2*n^2 + 415*a^4*d^4*e^2*n^2 - 300*(b^4*c*d^3*e^2*n^2 -
a*b^3*d^4*e^2*n^2)*x^3 + 6*(13*b^4*c^2*d^2*e^2*n^2 - 176*a*b^3*c*d^3*e^2*n^
2 + 163*a^2*b^2*d^4*e^2*n^2)*x^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^
2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2
*n^2)*log(b*x + a)^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 +
6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(d*
x + c)^2 - 4*(7*b^4*c^3*d*e^2*n^2 - 60*a*b^3*c^2*d^2*e^2*n^2 + 324*a^2*b^2*
c*d^3*e^2*n^2 - 271*a^3*b*d^4*e^2*n^2)*x - 300*(b^4*d^4*e^2*n^2*x^4 + 4*a*b
^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^
4*d^4*e^2*n^2)*log(b*x + a) + 12*(25*b^4*d^4*e^2*n^2*x^4 + 100*a*b^3*d^4*e^
```

2*n^2*x^3 + 150*a^2*b^2*d^4*e^2*n^2*x^2 + 100*a^3*b*d^4*e^2*n^2*x + 25*a^4*d^4*e^2*n^2 - 12*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x + a))*log(d*x + c))*log((b*x + a)^n*e/(d*x + c)^n)/((a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)*e) + (27*b^4*c^4*e^3*n^3 - 256*a*b^3*c^3*d*e^3*n^3 + 1296*a^2*b^2*c^2*d^2*e^3*n^3 - 6912*a^3*b*c*d^3*e^3*n^3 + 5845*a^4*d^4*e^3*n^3 - 4980*(b^4*c*d^3*e^3*n^3 - a*b^3*d^4*e^3*n^3)*x^3 - 288*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a)^3 + 288*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(d*x + c)^3 + 30*(23*b^4*c^2*d^2*e^3*n^3 - 544*a*b^3*c*d^3*e^3*n^3 + 521*a^2*b^2*d^4*e^3*n^3)*x^2 + 1800*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a)^2 + 72*(25*b^4*d^4*e^3*n^3*x^4 + 100*a*b^3*d^4*e^3*n^3*x^3 + 150*a^2*b^2*d^4*e^3*n^3*x^2 + 100*a^3*b*d^4*e^3*n^3*x + 25*a^4*d^4*e^3*n^3 - 12*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a))*log(d*x + c)^2 - 4*(37*b^4*c^3*d*e^3*n^3 - 456*a*b^3*c^2*d^2*e^3*n^3 + 4536*a^2*b^2*c*d^3*e^3*n^3 - 4117*a^3*b*d^4*e^3*n^3)*x - 4980*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a) + 12*(415*b^4*d^4*e^3*n^3*x^4 + 1660*a*b^3*d^4*e^3*n^3*x^3 + 2490*a^2*b^2*d^4*e^3*n^3*x^2 + 1660*a^3*b*d^4*e^3*n^3*x + 415*a^4*d^4*e^3*n^3 + 72*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a)^2 - 300*(b^4*d^4*e^3*n^3*x^4 + 4*a*b^3*d^4*e^3*n^3*x^3 + 6*a^2*b^2*d^4*e^3*n^3*x^2 + 4*a^3*b*d^4*e^3*n^3*x + a^4*d^4*e^3*n^3)*log(b*x + a))*log(d*x + c))/((a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*x)*e^2))/e)*B^3 + 1/96*A*B^2*(12*(12*d^4*e*n*log(b*x + a)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3

```
*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^
3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b
^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*log((b*x + a)^n*e/(d*x + c)^n
)/e - (9*b^4*c^4*e^2*n^2 - 64*a*b^3*c^3*d*e^2*n^2 + 216*a^2*b^2*c^2*d^2*e^2
*n^2 - 576*a^3*b*c*d^3*e^2*n^2 + 415*a^4*d^4*e^2*n^2 - 300*(b^4*c*d^3*e^2*n
^2 - a*b^3*d^4*e^2*n^2)*x^3 + 6*(13*b^4*c^2*d^2*e^2*n^2 - 176*a*b^3*c*d^3*e
^2*n^2 + 163*a^2*b^2*d^4*e^2*n^2)*x^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d
^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^
4*e^2*n^2)*log(b*x + a)^2 + 72*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x
^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*l
og(d*x + c)^2 - 4*(7*b^4*c^3*d*e^2*n^2 - 60*a*b^3*c^2*d^2*e^2*n^2 + 324*a^2
*b^2*c*d^3*e^2*n^2 - 271*a^3*b*d^4*e^2*n^2)*x - 300*(b^4*d^4*e^2*n^2*x^4 +
4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x
 + a^4*d^4*e^2*n^2)*log(b*x + a) + 12*(25*b^4*d^4*e^2*n^2*x^4 + 100*a*b^3*d
^4*e^2*n^2*x^3 + 150*a^2*b^2*d^4*e^2*n^2*x^2 + 100*a^3*b*d^4*e^2*n^2*x + 25
*a^4*d^4*e^2*n^2 - 12*(b^4*d^4*e^2*n^2*x^4 + 4*a*b^3*d^4*e^2*n^2*x^3 + 6*a^
2*b^2*d^4*e^2*n^2*x^2 + 4*a^3*b*d^4*e^2*n^2*x + a^4*d^4*e^2*n^2)*log(b*x +
a))*log(d*x + c))/((a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a
^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4
*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*
b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b
^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x^2 + 4*(a^3*
b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d
^4)*x)*e^2)) - 3/4*A*B^2*log((b*x + a)^n*e/(d*x + c)^n)^2/(b^5*x^4 + 4*a*b^
4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^4*b) + 1/16*(12*d^4*e*n*log(b*x + a
)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^
4) - 12*d^4*e*n*log(d*x + c)/(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4) + (12*b^3*d^3*e*n*x^3 - 3*b^3*c^3*e*n + 13*a*
b^2*c^2*d*e*n - 23*a^2*b*c*d^2*e*n + 25*a^3*d^3*e*n - 6*(b^3*c*d^2*e*n - 7*
a*b^2*d^3*e*n)*x^2 + 4*(b^3*c^2*d*e*n - 5*a*b^2*c*d^2*e*n + 13*a^2*b*d^3*e*
n)*x)/(a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3 + (b^8*c
^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*x^4 + 4*(a*b^7*c^3 - 3*
a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*x^3 + 6*(a^2*b^6*c^3 - 3*a^3
*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^
4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*x))*A^2*B/e - 3/4*A^2*B*log((b*x +
 a)^n*e/(d*x + c)^n)/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x +
 a^4*b) - 1/4*A^3/(b^5*x^4 + 4*a*b^4*x^3 + 6*a^2*b^3*x^2 + 4*a^3*b^2*x + a^
4*b)
```

Fricas [B] time = 2.45033, size = 12382, normalized size = 14.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x, algorithm="fric
as")
```

```
[Out] -1/1152*(288*A^3*b^4*c^4 - 1152*A^3*a*b^3*c^3*d + 1728*A^3*a^2*b^2*c^2*d^2
- 1152*A^3*a^3*b*c*d^3 + 288*A^3*a^4*d^4 + (27*B^3*b^4*c^4 - 256*B^3*a*b^3*
c^3*d + 1296*B^3*a^2*b^2*c^2*d^2 - 6912*B^3*a^3*b*c*d^3 + 5845*B^3*a^4*d^4)
*n^3 - 12*(415*(B^3*b^4*c*d^3 - B^3*a*b^3*d^4)*n^3 + 300*(A*B^2*b^4*c*d^3 -
 A*B^2*a*b^3*d^4)*n^2 + 72*(A^2*B*b^4*c*d^3 - A^2*B*a*b^3*d^4)*n)*x^3 - 288
*(B^3*b^4*d^4*n^3*x^4 + 4*B^3*a*b^3*d^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2
 + 4*B^3*a^3*b*d^4*n^3*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2
*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n^3)*log(b*x + a)^3 + 288*(B^3*b^4*d^4*n^3*x^
4 + 4*B^3*a*b^3*d^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2 + 4*B^3*a^3*b*d^4*n
^3*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3
*b*c*d^3)*n^3)*log(d*x + c)^3 + 288*(B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^
3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3 + B^3*a^4*d^4)*log(e)^3 + 12*(9*A*B^2
*b^4*c^4 - 64*A*B^2*a*b^3*c^3*d + 216*A*B^2*a^2*b^2*c^2*d^2 - 576*A*B^2*a^3
*b*c*d^3 + 415*A*B^2*a^4*d^4)*n^2 + 6*(5*(23*B^3*b^4*c^2*d^2 - 544*B^3*a*b^
3*c*d^3 + 521*B^3*a^2*b^2*d^4)*n^3 + 12*(13*A*B^2*b^4*c^2*d^2 - 176*A*B^2*a
*b^3*c*d^3 + 163*A*B^2*a^2*b^2*d^4)*n^2 + 72*(A^2*B*b^4*c^2*d^2 - 8*A^2*B*a
*b^3*c*d^3 + 7*A^2*B*a^2*b^2*d^4)*n)*x^2 - 72*((25*B^3*b^4*d^4*n^3 + 12*A*B
^2*b^4*d^4*n^2)*x^4 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*
c^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^3 + 4*(12*A*B^2*a*b^3*d^4*n^2 + (3*B^3*b^4*
c*d^3 + 22*B^3*a*b^3*d^4)*n^3)*x^3 - 12*(A*B^2*b^4*c^4 - 4*A*B^2*a*b^3*c^3*
d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^
2*d^4*n^2 - (B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^3)
*x^2 + 4*(12*A*B^2*a^3*b*d^4*n^2 + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 1
8*B^3*a^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^3)*x + 12*(B^3*b^4*d^4*n^2*x^4 +
4*B^3*a*b^3*d^4*n^2*x^3 + 6*B^3*a^2*b^2*d^4*n^2*x^2 + 4*B^3*a^3*b*d^4*n^2*x
 - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c
*d^3)*n^2)*log(e))*log(b*x + a)^2 - 72*((25*B^3*b^4*d^4*n^3 + 12*A*B^2*b^4*
d^4*n^2)*x^4 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*c^2*d^2
 - 48*B^3*a^3*b*c*d^3)*n^3 + 4*(12*A*B^2*a*b^3*d^4*n^2 + (3*B^3*b^4*c*d^3 +
 22*B^3*a*b^3*d^4)*n^3)*x^3 - 12*(A*B^2*b^4*c^4 - 4*A*B^2*a*b^3*c^3*d + 6*A
*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^2*d^4*n
^2 - (B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^3)*x^2 +
4*(12*A*B^2*a^3*b*d^4*n^2 + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 18*B^3*a
^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^3)*x + 12*(B^3*b^4*d^4*n^3*x^4 + 4*B^3*a
*b^3*d^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2 + 4*B^3*a^3*b*d^4*n^3*x - (B^3
*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n
^3)*log(b*x + a) + 12*(B^3*b^4*d^4*n^2*x^4 + 4*B^3*a*b^3*d^4*n^2*x^3 + 6*B^
3*a^2*b^2*d^4*n^2*x^2 + 4*B^3*a^3*b*d^4*n^2*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*
c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n^2)*log(e))*log(d*x + c
```

```
)^2 + 72*(12*A*B^2*b^4*c^4 - 48*A*B^2*a*b^3*c^3*d + 72*A*B^2*a^2*b^2*c^2*d^
2 - 48*A*B^2*a^3*b*c*d^3 + 12*A*B^2*a^4*d^4 - 12*(B^3*b^4*c*d^3 - B^3*a*b^3
*d^4)*n*x^3 + 6*(B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 + 7*B^3*a^2*b^2*d^4)*n
*x^2 - 4*(B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 18*B^3*a^2*b^2*c*d^3 - 13*B
^3*a^3*b*d^4)*n*x + (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*c^
2*d^2 - 48*B^3*a^3*b*c*d^3 + 25*B^3*a^4*d^4)*n)*log(e)^2 + 72*(3*A^2*B*b^4*
c^4 - 16*A^2*B*a*b^3*c^3*d + 36*A^2*B*a^2*b^2*c^2*d^2 - 48*A^2*B*a^3*b*c*d^
3 + 25*A^2*B*a^4*d^4)*n - 4*((37*B^3*b^4*c^3*d - 456*B^3*a*b^3*c^2*d^2 + 45
36*B^3*a^2*b^2*c*d^3 - 4117*B^3*a^3*b*d^4)*n^3 + 12*(7*A*B^2*b^4*c^3*d - 60
*A*B^2*a*b^3*c^2*d^2 + 324*A*B^2*a^2*b^2*c*d^3 - 271*A*B^2*a^3*b*d^4)*n^2 +
 72*(A^2*B*b^4*c^3*d - 6*A^2*B*a*b^3*c^2*d^2 + 18*A^2*B*a^2*b^2*c*d^3 - 13*
A^2*B*a^3*b*d^4)*n)*x - 12*((415*B^3*b^4*d^4*n^3 + 300*A*B^2*b^4*d^4*n^2 +
72*A^2*B*b^4*d^4*n)*x^4 - (9*B^3*b^4*c^4 - 64*B^3*a*b^3*c^3*d + 216*B^3*a^2
*b^2*c^2*d^2 - 576*B^3*a^3*b*c*d^3)*n^3 + 4*(72*A^2*B*a*b^3*d^4*n + 5*(15*B
^3*b^4*c*d^3 + 68*B^3*a*b^3*d^4)*n^3 + 12*(3*A*B^2*b^4*c*d^3 + 22*A*B^2*a*b
^3*d^4)*n^2)*x^3 - 12*(3*A*B^2*b^4*c^4 - 16*A*B^2*a*b^3*c^3*d + 36*A*B^2*a^
2*b^2*c^2*d^2 - 48*A*B^2*a^3*b*c*d^3)*n^2 + 6*(72*A^2*B*a^2*b^2*d^4*n - (13
*B^3*b^4*c^2*d^2 - 176*B^3*a*b^3*c*d^3 - 252*B^3*a^2*b^2*d^4)*n^3 - 12*(A*B
^2*b^4*c^2*d^2 - 8*A*B^2*a*b^3*c*d^3 - 18*A*B^2*a^2*b^2*d^4)*n^2)*x^2 + 72*
(B^3*b^4*d^4*n*x^4 + 4*B^3*a*b^3*d^4*n*x^3 + 6*B^3*a^2*b^2*d^4*n*x^2 + 4*B^
3*a^3*b*d^4*n*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2
- 4*B^3*a^3*b*c*d^3)*n)*log(e)^2 - 72*(A^2*B*b^4*c^4 - 4*A^2*B*a*b^3*c^3*d
+ 6*A^2*B*a^2*b^2*c^2*d^2 - 4*A^2*B*a^3*b*c*d^3)*n + 4*(72*A^2*B*a^3*b*d^4*
n + (7*B^3*b^4*c^3*d - 60*B^3*a*b^3*c^2*d^2 + 324*B^3*a^2*b^2*c*d^3 + 144*B
^3*a^3*b*d^4)*n^3 + 12*(A*B^2*b^4*c^3*d - 6*A*B^2*a*b^3*c^2*d^2 + 18*A*B^2*
a^2*b^2*c*d^3 + 12*A*B^2*a^3*b*d^4)*n^2)*x + 12*((25*B^3*b^4*d^4*n^2 + 12*A
*B^2*b^4*d^4*n)*x^4 + 4*(12*A*B^2*a*b^3*d^4*n + (3*B^3*b^4*c*d^3 + 22*B^3*a
*b^3*d^4)*n^2)*x^3 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*a^2*b^2*c
^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^2*d^4*n - (B^3*b^4*c^2
*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B^2*b^4*c^4
 - 4*A*B^2*a*b^3*c^3*d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n +
 4*(12*A*B^2*a^3*b*d^4*n + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 + 18*B^3*a^
2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^2)*x)*log(e))*log(b*x + a) + 12*((415*B^3
*b^4*d^4*n^3 + 300*A*B^2*b^4*d^4*n^2 + 72*A^2*B*b^4*d^4*n)*x^4 - (9*B^3*b^4
*c^4 - 64*B^3*a*b^3*c^3*d + 216*B^3*a^2*b^2*c^2*d^2 - 576*B^3*a^3*b*c*d^3)*
n^3 + 4*(72*A^2*B*a*b^3*d^4*n + 5*(15*B^3*b^4*c*d^3 + 68*B^3*a*b^3*d^4)*n^3
 + 12*(3*A*B^2*b^4*c*d^3 + 22*A*B^2*a*b^3*d^4)*n^2)*x^3 - 12*(3*A*B^2*b^4*c
^4 - 16*A*B^2*a*b^3*c^3*d + 36*A*B^2*a^2*b^2*c^2*d^2 - 48*A*B^2*a^3*b*c*d^3
)*n^2 + 6*(72*A^2*B*a^2*b^2*d^4*n - (13*B^3*b^4*c^2*d^2 - 176*B^3*a*b^3*c*d
^3 - 252*B^3*a^2*b^2*d^4)*n^3 - 12*(A*B^2*b^4*c^2*d^2 - 8*A*B^2*a*b^3*c*d^3
 - 18*A*B^2*a^2*b^2*d^4)*n^2)*x^2 + 72*(B^3*b^4*d^4*n^3*x^4 + 4*B^3*a*b^3*d
^4*n^3*x^3 + 6*B^3*a^2*b^2*d^4*n^3*x^2 + 4*B^3*a^3*b*d^4*n^3*x - (B^3*b^4*c
^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n^3)*lo
g(b*x + a)^2 + 72*(B^3*b^4*d^4*n*x^4 + 4*B^3*a*b^3*d^4*n*x^3 + 6*B^3*a^2*b^
2*d^4*n*x^2 + 4*B^3*a^3*b*d^4*n*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^
```

```
3*a^2*b^2*c^2*d^2 - 4*B^3*a^3*b*c*d^3)*n)*log(e)^2 - 72*(A^2*B*b^4*c^4 - 4*
A^2*B*a*b^3*c^3*d + 6*A^2*B*a^2*b^2*c^2*d^2 - 4*A^2*B*a^3*b*c*d^3)*n + 4*(7
2*A^2*B*a^3*b*d^4*n + (7*B^3*b^4*c^3*d - 60*B^3*a*b^3*c^2*d^2 + 324*B^3*a^2
*b^2*c*d^3 + 144*B^3*a^3*b*d^4)*n^3 + 12*(A*B^2*b^4*c^3*d - 6*A*B^2*a*b^3*c
^2*d^2 + 18*A*B^2*a^2*b^2*c*d^3 + 12*A*B^2*a^3*b*d^4)*n^2)*x + 12*((25*B^3*
b^4*d^4*n^3 + 12*A*B^2*b^4*d^4*n^2)*x^4 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3
*d + 36*B^3*a^2*b^2*c^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^3 + 4*(12*A*B^2*a*b^3*d
^4*n^2 + (3*B^3*b^4*c*d^3 + 22*B^3*a*b^3*d^4)*n^3)*x^3 - 12*(A*B^2*b^4*c^4
- 4*A*B^2*a*b^3*c^3*d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c*d^3)*n^2
+ 6*(12*A*B^2*a^2*b^2*d^4*n^2 - (B^3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B
^3*a^2*b^2*d^4)*n^3)*x^2 + 4*(12*A*B^2*a^3*b*d^4*n^2 + (B^3*b^4*c^3*d - 6*B
^3*a*b^3*c^2*d^2 + 18*B^3*a^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^3)*x + 12*(B^
3*b^4*d^4*n^2*x^4 + 4*B^3*a*b^3*d^4*n^2*x^3 + 6*B^3*a^2*b^2*d^4*n^2*x^2 + 4
*B^3*a^3*b*d^4*n^2*x - (B^3*b^4*c^4 - 4*B^3*a*b^3*c^3*d + 6*B^3*a^2*b^2*c^2
*d^2 - 4*B^3*a^3*b*c*d^3)*n^2)*log(e))*log(b*x + a) + 12*((25*B^3*b^4*d^4*n
^2 + 12*A*B^2*b^4*d^4*n)*x^4 + 4*(12*A*B^2*a*b^3*d^4*n + (3*B^3*b^4*c*d^3 +
 22*B^3*a*b^3*d^4)*n^2)*x^3 - (3*B^3*b^4*c^4 - 16*B^3*a*b^3*c^3*d + 36*B^3*
a^2*b^2*c^2*d^2 - 48*B^3*a^3*b*c*d^3)*n^2 + 6*(12*A*B^2*a^2*b^2*d^4*n - (B^
3*b^4*c^2*d^2 - 8*B^3*a*b^3*c*d^3 - 18*B^3*a^2*b^2*d^4)*n^2)*x^2 - 12*(A*B^
2*b^4*c^4 - 4*A*B^2*a*b^3*c^3*d + 6*A*B^2*a^2*b^2*c^2*d^2 - 4*A*B^2*a^3*b*c
*d^3)*n + 4*(12*A*B^2*a^3*b*d^4*n + (B^3*b^4*c^3*d - 6*B^3*a*b^3*c^2*d^2 +
18*B^3*a^2*b^2*c*d^3 + 12*B^3*a^3*b*d^4)*n^2)*x)*log(e))*log(d*x + c) + 12*
(72*A^2*B*b^4*c^4 - 288*A^2*B*a*b^3*c^3*d + 432*A^2*B*a^2*b^2*c^2*d^2 - 288
*A^2*B*a^3*b*c*d^3 + 72*A^2*B*a^4*d^4 - 12*(25*(B^3*b^4*c*d^3 - B^3*a*b^3*d
^4)*n^2 + 12*(A*B^2*b^4*c*d^3 - A*B^2*a*b^3*d^4)*n)*x^3 + (9*B^3*b^4*c^4 -
64*B^3*a*b^3*c^3*d + 216*B^3*a^2*b^2*c^2*d^2 - 576*B^3*a^3*b*c*d^3 + 415*B^
3*a^4*d^4)*n^2 + 6*((13*B^3*b^4*c^2*d^2 - 176*B^3*a*b^3*c*d^3 + 163*B^3*a^2
*b^2*d^4)*n^2 + 12*(A*B^2*b^4*c^2*d^2 - 8*A*B^2*a*b^3*c*d^3 + 7*A*B^2*a^2*b
^2*d^4)*n)*x^2 + 12*(3*A*B^2*b^4*c^4 - 16*A*B^2*a*b^3*c^3*d + 36*A*B^2*a^2*
b^2*c^2*d^2 - 48*A*B^2*a^3*b*c*d^3 + 25*A*B^2*a^4*d^4)*n - 4*((7*B^3*b^4*c^
3*d - 60*B^3*a*b^3*c^2*d^2 + 324*B^3*a^2*b^2*c*d^3 - 271*B^3*a^3*b*d^4)*n^2
 + 12*(A*B^2*b^4*c^3*d - 6*A*B^2*a*b^3*c^2*d^2 + 18*A*B^2*a^2*b^2*c*d^3 - 1
3*A*B^2*a^3*b*d^4)*n)*x)*log(e))/(a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3
*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b
^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*
c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^3 + 6*(a^2*b^7
*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)
*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d
^3 + a^7*b^2*d^4)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(b*x+a)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{(bx+a)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(b*x+a)^5,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(b*x + a)^5, x)
```

3.172 $\int \frac{1}{(ag+bgx)^2(A+B\log(e(a+bx)^n(c+dx)^{-n}))} \, dx$

Optimal. Leaf size=96

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{1}{n}}\text{Ei}\left(-\frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

```
[Out] (E^(A/(B*n))*(c + d*x)*((e*(a + b*x)^n)/(c + d*x)^n)^n^(-1)*ExpIntegralEi[-
((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(B*n))])/(B*(b*c - a*d)*g^2*n*(a
+ b*x))
```

Rubi [F] time = 0.0998305, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)} \, dx = \int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)} \, dx$$

Mathematica [F] time = 0.0803575, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

Maple [F] time = 3.688, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

Fricas [A] time = 1.02981, size = 149, normalized size = 1.55

$$\frac{e^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)}{(Bbc-Bad)g^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
fricas")
```

```
[Out] e^((B*log(e) + A)/(B*n))*log_integral((d*x + c)*e^(-(B*log(e) + A)/(B*n))/(
b*x + a))/((B*b*c - B*a*d)*g^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^2\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

3.173 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\,dx$

Optimal. Leaf size=180

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5b}-\frac{Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}-\frac{Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}+\frac{Bg^4(bc-ad)^5\,\mathrm{l}}{5bd^5}$$

```
[Out] -(B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(10*b*
d^3) - (B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) + (B*(b*c - a*d)*g^4*(a
 + b*x)^4)/(20*b*d) + (B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5) + (g^4*(
a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(5*b)
```

Rubi [A] time = 0.124199, antiderivative size = 180, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5b}-\frac{Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{10bd^3}-\frac{Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}+\frac{Bg^4(bc-ad)^5\,\mathrm{l}}{5bd^5}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(10*b*
d^3) - (B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) + (B*(b*c - a*d)*g^4*(a
 + b*x)^4)/(20*b*d) + (B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5) + (g^4*(
a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(5*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right) dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5b} - \frac{B\int \frac{(-bc+ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5b} + \frac{\left(B(bc-ad)g^4\right)\int \frac{(a+bx)^4}{c+dx}\,dx}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5b} + \frac{\left(B(bc-ad)g^4\right)\int \left(-\frac{b(bc-ad)^3}{d^4} + \frac{b(bc-ad)^2}{d^3}\right.}{}$$

$$= -\frac{B(bc-ad)^4g^4x}{5d^4} + \frac{B(bc-ad)^3g^4(a+bx)^2}{10bd^3} - \frac{B(bc-ad)^2g^4(a+bx)^3}{15bd^2} + \frac{B(}{}$$

Mathematica [A] time = 0.100868, size = 142, normalized size = 0.79

$$\frac{g^4\left((a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right) - \frac{B(ad-bc)\left(6d^2(a+bx)^2(bc-ad)^2+4d^3(a+bx)^3(ad-bc)-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(a+bx)^4\right)}{12d^5}\right)}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g^4*(-(B*(-(b*c) + a*d)*(-12*b*d*(b*c - a*d)^3*x + 6*d^2*(b*c - a*d)^2*(a
+ b*x)^2 + 4*d^3*(-(b*c) + a*d)*(a + b*x)^3 + 3*d^4*(a + b*x)^4 + 12*(b*c -
 a*d)^4*Log[c + d*x]))/(12*d^5) + (a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a +
 b*x)])))/(5*b)
```

Maple [B] time = 0.201, size = 2930, normalized size = 16.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] 1/10*b^4*e^2*B*g^4/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*c^5+1/15/b*e^3*B*g^
4*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^5-1/15*b^4*e^3*B*g^4/d^2/(-e/(b*x+
a)*a*d+b*e/(b*x+a)*c)^3*c^5-2/3*b^2*e^3*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c
)^3*a^2*c^3-b*e^2*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^3*c^2+1/5*b^4*e^
5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*c^
5+2*b*B*g^4/d^2*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^3*c^2-2*b^2*B*g^4
/d^3*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^2*c^3+b^3*B*g^4/d^4*ln(b*(d*
e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*c^4*a+1/4*e^4*B*g^4*d^3/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)^4*a^4*c-1/3*e^3*B*g^4*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^4*
c+e^5*A*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^4*d^4*c+1/2*e^2*B*g^4/(-e/(b
*x+a)*a*d+b*e/(b*x+a)*c)^2*a^4*c*d+1/5/b*e*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a
)*c)*a^5*d-1/4*b^3*e^4*B*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a*c^4+2/3*b*e
^3*B*g^4*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^3*c^2-1/2*b^3*e^2*B*g^4/d^2/(
-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a*c^4+1/5*b^4*e^5*A*g^4/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)^5*c^5-1/5*b^4*B*g^4/d^5*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)
*c^5-B*g^4/d*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^4*c-1/5/b*e^5*A*g^4/
(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^5*d^5-1/10/b*e^2*B*g^4*d^2/(-e/(b*x+a)*a
*d+b*e/(b*x+a)*c)^2*a^5-1/20/b*e^4*B*g^4*d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)
^4*a^5+1/20*b^4*e^4*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^5-1/5*b^4*e*
B*g^4/d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*c^5-e*B*g^4/(-e/(b*x+a)*a*d+b*e/(b
*x+a)*c)*a^4*c+1/5/b*B*g^4*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^5+2*b^
2*e^5*A*g^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^2*c^3*d^2-b^3*e^5*A*g^4/(-e/
(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a*c^4*d+e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+
a))*d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^4*c-1/5/b*e^5*B*g^4*ln(d*e/b-e*(
a*d-b*c)/b/(b*x+a))*d^5/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^5-1/2*b*e^4*B*g^
4*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^3*c^2+1/2*b^2*e^4*B*g^4*d/(-e/(b*x
+a)*a*d+b*e/(b*x+a)*c)^4*a^2*c^3+b^2*e^2*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a
)*c)^2*a^2*c^3-2*b^2*e*B*g^4/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^2*c^3+b^3
*e*B*g^4/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a*c^4-2*b*e^5*A*g^4/(-e/(b*x+a)
*a*d+b*e/(b*x+a)*c)^5*a^3*c^2*d^3+2*b*e*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)
*c)*a^3*c^2+1/3*b^3*e^3*B*g^4/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^4*a-2*b*
e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c
)^5*a^3*c^2+2*b^2*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(b*x+a)
*a*d+b*e/(b*x+a)*c)^5*a^2*c^3-b^3*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))
*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a*c^4+1/5/b*e^5*B*g^4*ln(d*e/b-e*(a*d-b
*c)/b/(b*x+a))*d^5/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^10/(b*x+a)^5+1/5*b^9*
```

```
e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^5/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c
)^5*c^10/(b*x+a)^5-252/5*b^4*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/
(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^5*c^5/(b*x+a)^5-2*e^5*B*g^4*ln(d*e/b-e*(a*d-
b*c)/b/(b*x+a))*d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^9*c/(b*x+a)^5+9*b*e^
5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^
5*a^8*c^2/(b*x+a)^5-24*b^2*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-
e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^7*c^3/(b*x+a)^5+42*b^3*e^5*B*g^4*ln(d*e/b-
e*(a*d-b*c)/b/(b*x+a))*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^6*c^4/(b*x+a)^5
+42*b^5*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d/(-e/(b*x+a)*a*d+b*e/(b*
x+a)*c)^5*a^4*c^6/(b*x+a)^5-24*b^6*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a)
)/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^3*c^7/(b*x+a)^5+9*b^7*e^5*B*g^4*ln
(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^5*a^2*c^8/
(b*x+a)^5-2*b^8*e^5*B*g^4*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^4/(-e/(b*x+a)*a
*d+b*e/(b*x+a)*c)^5*a*c^9/(b*x+a)^5
```

Maximा [B]

time = 1.29752, size = 836, normalized size = 4.64

$$\frac{1}{5}Ab^4g^4x^5 + Aab^3g^4x^4 + 2\,Aa^2b^2g^4x^3 + 2\,Aa^3bg^4x^2 + \left(x\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right) - \frac{a\log(bx+a)}{b} + \frac{c\log(dx+c)}{d}\right)Ba^4g$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b + c*log(d*x
 + c)/d)*B*a^4*g^4 + 2*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + a^2*log(
b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*B*a^3*b*g^4 + (2
*x^3*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*
log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2
*d^2))*B*a^2*b^2*g^4 + 1/6*(6*x^4*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + 6*
a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*
x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B
*a*b^3*g^4 + 1/60*(12*x^5*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - 12*a^5*log
(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 -
4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4
*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

Fricas [B] time = 1.35211, size = 910, normalized size = 5.06

$$\frac{12\,Ab^5d^5g^4x^5 - 12\,Ba^5d^5g^4\log(bx+a) + 3\left(Bb^5cd^4 + (20\,A - B)ab^4d^5\right)g^4x^4 - 4\left(Bb^5c^2d^3 - 5\,Bab^4cd^4 - 2\,(15\,A - 2\,B)a^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 - 12*B*a^5*d^5*g^4*log(b*x + a) + 3*(B*b^5*c*d^4
 + (20*A - B)*a*b^4*d^5)*g^4*x^4 - 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 - 2*(
15*A - 2*B)*a^2*b^3*d^5)*g^4*x^3 + 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 1
0*B*a^2*b^3*c*d^4 + 2*(10*A - 3*B)*a^3*b^2*d^5)*g^4*x^2 - 12*(B*b^5*c^4*d -
 5*B*a*b^4*c^3*d^2 + 10*B*a^2*b^3*c^2*d^3 - 10*B*a^3*b^2*c*d^4 - (5*A - 4*B
)*a^4*b*d^5)*g^4*x + 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2
 - 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 12*(B*b^5*d^5
*g^4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*
d^5*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^5)
```

Sympy [B] time = 8.53226, size = 993, normalized size = 5.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b**4*g**4*x**5/5 - B*a**5*g**4*log(x + (B*a**6*d**5*g**4/b + 5*B*a**5*c*d
**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b**2*c**3*d**2*g**4 - 5*B
*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4)/(B*a**5*d**5*g**4 + 5*B*a**4*b
*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d**2*g**
4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*b) + B*c*g**4*(5*a**4*d*
*4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**
4)*log(x + (6*B*a**5*c*d**4*g**4 - 10*B*a**4*b*c**2*d**3*g**4 + 10*B*a**3*b
**2*c**3*d**2*g**4 - 5*B*a**2*b**3*c**4*d*g**4 + B*a*b**4*c**5*g**4 - B*a*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4) + B*b*c**2*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**
2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/(B*a**5*d**5*g**4 + 5*B*
a**4*b*c*d**4*g**4 - 10*B*a**3*b**2*c**2*d**3*g**4 + 10*B*a**2*b**3*c**3*d*
*2*g**4 - 5*B*a*b**4*c**4*d*g**4 + B*b**5*c**5*g**4))/(5*d**5) + (B*a**4*g*
*4*x + 2*B*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g**4*x**3 + B*a*b**3*g**4*x**4
```

```
+ B*b**4*g**4*x**5/5)*log(e*(c + d*x)/(a + b*x)) + x**4*(20*A*a*b**3*d*g**4
 - B*a*b**3*d*g**4 + B*b**4*c*g**4)/(20*d) + x**3*(30*A*a**2*b**2*d**2*g**4
 - 4*B*a**2*b**2*d**2*g**4 + 5*B*a*b**3*c*d*g**4 - B*b**4*c**2*g**4)/(15*d*
*2) + x**2*(20*A*a**3*b*d**3*g**4 - 6*B*a**3*b*d**3*g**4 + 10*B*a**2*b**2*c
*d**2*g**4 - 5*B*a*b**3*c**2*d*g**4 + B*b**4*c**3*g**4)/(10*d**3) + x*(5*A*
a**4*d**4*g**4 - 4*B*a**4*d**4*g**4 + 10*B*a**3*b*c*d**3*g**4 - 10*B*a**2*b
**2*c**2*d**2*g**4 + 5*B*a*b**3*c**3*d*g**4 - B*b**4*c**4*g**4)/(5*d**4)
```

Giac [B] time = 89.5295, size = 635, normalized size = 3.53

$$-\frac{Ba^5g^4\log(bx+a)}{5\,b} + \frac{1}{5}\left(Ab^4g^4 + Bb^4g^4\right)x^5 + \frac{\left(Bb^4cg^4 + 20\,Aab^3dg^4 + 19\,Bab^3dg^4\right)x^4}{20\,d} - \frac{\left(Bb^4c^2g^4 - 5\,Bab^3cdg^4 - 30\,A\right.}{15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] -1/5*B*a^5*g^4*log(b*x + a)/b + 1/5*(A*b^4*g^4 + B*b^4*g^4)*x^5 + 1/20*(B*b
^4*c*g^4 + 20*A*a*b^3*d*g^4 + 19*B*a*b^3*d*g^4)*x^4/d - 1/15*(B*b^4*c^2*g^4
 - 5*B*a*b^3*c*d*g^4 - 30*A*a^2*b^2*d^2*g^4 - 26*B*a^2*b^2*d^2*g^4)*x^3/d^2
 + 1/5*(B*b^4*g^4*x^5 + 5*B*a*b^3*g^4*x^4 + 10*B*a^2*b^2*g^4*x^3 + 10*B*a^3
*b*g^4*x^2 + 5*B*a^4*g^4*x)*log((d*x + c)/(b*x + a)) + 1/10*(B*b^4*c^3*g^4
- 5*B*a*b^3*c^2*d*g^4 + 10*B*a^2*b^2*c*d^2*g^4 + 20*A*a^3*b*d^3*g^4 + 14*B*
a^3*b*d^3*g^4)*x^2/d^3 - 1/5*(B*b^4*c^4*g^4 - 5*B*a*b^3*c^3*d*g^4 + 10*B*a^
2*b^2*c^2*d^2*g^4 - 10*B*a^3*b*c*d^3*g^4 - 5*A*a^4*d^4*g^4 - B*a^4*d^4*g^4)
*x/d^4 + 1/5*(B*b^4*c^5*g^4 - 5*B*a*b^3*c^4*d*g^4 + 10*B*a^2*b^2*c^3*d^2*g^
4 - 10*B*a^3*b*c^2*d^3*g^4 + 5*B*a^4*c*d^4*g^4)*log(d*x + c)/d^5
```

3.174 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\,dx$

Optimal. Leaf size=149

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{4b}+\frac{Bg^3x(bc-ad)^3}{4d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}+\frac{Bg^3(a+bx)}{12b}$$

```
[Out] (B*(b*c - a*d)^3*g^3*x)/(4*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(8*b*d^
2) + (B*(b*c - a*d)*g^3*(a + b*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*g^3*Log[c
+ d*x])/(4*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/
(4*b)
```

Rubi [A] time = 0.101091, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{4b}+\frac{Bg^3x(bc-ad)^3}{4d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{8bd^2}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{4bd^4}+\frac{Bg^3(a+bx)}{12b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^3*x)/(4*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(8*b*d^
2) + (B*(b*c - a*d)*g^3*(a + b*x)^3)/(12*b*d) - (B*(b*c - a*d)^4*g^3*Log[c
+ d*x])/(4*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/
(4*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b} - \frac{B\int\frac{(-bc+ad)g^4(a+bx)^3}{c+dx}\,dx}{4bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b} + \frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3}{c+dx}\,dx}{4b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b} + \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2}{d^3} - \frac{b(bc-ad)(a+}{d^2}\right.}{4b}$$

$$= \frac{B(bc-ad)^3g^3x}{4d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2}{8bd^2} + \frac{B(bc-ad)g^3(a+bx)^3}{12bd} - \frac{B(bc}{}$$

Mathematica [A] time = 0.0800694, size = 120, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{6d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g^3*((B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x
)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/(6*d^4) + (a + b*x
)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])))/(4*b)
```

Maple [B] time = 0.158, size = 2191, normalized size = 14.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] 2*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)
*c)^4*a^7/(b*x+a)^4*c+3/2*b*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(
-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^2*c^2-b^2*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/
b/(b*x+a))*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a*c^3-1/4*b^7*e^4*B*g^3*ln(d*
e/b-e*(a*d-b*c)/b/(b*x+a))/d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^8/(b*x+a)
^4-35/2*b^3*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(
b*x+a)*c)^4*a^4*c^4/(b*x+a)^4-1/4/b*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a
))*d^4/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^8/(b*x+a)^4+14*b^4*e^4*B*g^3*ln(d
*e/b-e*(a*d-b*c)/b/(b*x+a))/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^3*c^5/(b*x
+a)^4-7*b^5*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^2/(-e/(b*x+a)*a*d+b
*e/(b*x+a)*c)^4*a^2*c^6/(b*x+a)^4+14*b^2*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(
b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^5*c^3/(b*x+a)^4*d-7*b*e^4*B*g^3*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^6*c^
2/(b*x+a)^4+2*b^6*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^3/(-e/(b*x+a)
*a*d+b*e/(b*x+a)*c)^4*a*c^7/(b*x+a)^4+1/4*b^3*e^4*A*g^3/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)^4*c^4+1/4*b^3*B*g^3/d^4*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)
*c^4-B*g^3/d*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^3*c-e*B*g^3/(-e/(b*x
+a)*a*d+b*e/(b*x+a)*c)*a^3*c-1/3*b^2*e^3*B*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*
c)^3*a*c^3-3/4*b*e^2*B*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^2*c^2+1/4*b^3
*e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4
*c^4-b^2*B*g^3/d^3*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*c^3*a+3/2*b*B*g^
3/d^2*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^2*c^2+1/4/b*e^4*A*g^3/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^4*d^4+1/4*b^3*e*B*g^3/d^3/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)*c^4+1/4/b*e*B*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^4*d+1/4/b*e^
4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^
4*d^4+3/2*b*e*B*g^3/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^2*c^2-b^2*e^4*A*g^3/
(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*c^3*a*d+1/2*b*e^3*B*g^3/(-e/(b*x+a)*a*d+b*
e/(b*x+a)*c)^3*a^2*c^2*d+1/2*b^2*e^2*B*g^3/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)
^2*c^3*a-e^4*B*g^3*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(-e/(b*x+a)*a*d+b*e/
(b*x+a)*c)^4*a^3*c+3/2*b*e^4*A*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^2*c^2
*d^2+1/12/b*e^3*B*g^3*d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^4-1/8/b*e^2*B*
g^3*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^4-1/8*b^3*e^2*B*g^3/d^2/(-e/(b*x
+a)*a*d+b*e/(b*x+a)*c)^2*c^4+1/4/b*B*g^3*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))
-d*e)*a^4-b^2*e*B*g^3/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*c^3*a+1/12*b^3*e^3
*B*g^3/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^4-1/3*e^3*B*g^3*d^2/(-e/(b*x+a)
*a*d+b*e/(b*x+a)*c)^3*a^3*c+1/2*e^2*B*g^3*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^
2*a^3*c-e^4*A*g^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^4*a^3*d^3*c
```

Maxima [B] time = 1.1676, size = 589, normalized size = 3.95

$$\frac{1}{4}\,Ab^3g^3x^4 + Aab^2g^3x^3 + \frac{3}{2}\,Aa^2bg^3x^2 + \left(x\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right) - \frac{a\log(bx+a)}{b} + \frac{c\log(dx+c)}{d}\right)Ba^3g^3 + \frac{3}{2}\left(x^2\log\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(d*e*x/(b
*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b + c*log(d*x + c)/d)*B*a^3*g^3 +
 3/2*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + a^2*log(b*x + a)/b^2 - c^2
*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + 1/2*(2*x^3*log(d*e*x
/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d
^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*a*b^2
*g^3 + 1/24*(6*x^4*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + 6*a^4*log(b*x + a
)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^
2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^3 + A*a^
3*g^3*x
```

Fricas [B] time = 1.15715, size = 664, normalized size = 4.46

$$\frac{6\,Ab^4d^4g^3x^4 - 6\,Ba^4d^4g^3\log(bx+a) + 2\left(Bb^4cd^3 + (12\,A-B)ab^3d^4\right)g^3x^3 - 3\left(Bb^4c^2d^2 - 4\,Bab^3cd^3 - 3\,(4\,A-B)a^2b^2d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 - 6*B*a^4*d^4*g^3*log(b*x + a) + 2*(B*b^4*c*d^3 +
 (12*A - B)*a*b^3*d^4)*g^3*x^3 - 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - 3*(4*
A - B)*a^2*b^2*d^4)*g^3*x^2 + 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*
b^2*c*d^3 + (4*A - 3*B)*a^3*b*d^4)*g^3*x - 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
 6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 6*(B*b^4*d^4*g^3
*x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*
x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^4)
```

Sympy [B] time = 5.8668, size = 719, normalized size = 4.83

$$\frac{Ab^3g^3x^4}{4} - \frac{Ba^4g^3\log\left(x + \frac{\frac{Ba^5d^4g^3}{b}+4Ba^4cd^3g^3-6Ba^3bc^2d^2g^3+4Ba^2b^2c^3dg^3-Bab^3c^4g^3}{Ba^4d^4g^3+4Ba^3bcd^3g^3-6Ba^2b^2c^2d^2g^3+4Bab^3c^3dg^3-Bb^4c^4g^3}\right)}{4b} + \frac{Bcg^3\left(2ad-bc\right)\left(2a^2d^2-2abcd+b^2c^2\right)\log\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b**3*g**3*x**4/4 - B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*b) + B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(4*d**4) + (B*a**3*g**3*x + 3*B*a**2
*b*g**3*x**2/2 + B*a*b**2*g**3*x**3 + B*b**3*g**3*x**4/4)*log(e*(c + d*x)/(
a + b*x)) + x**3*(12*A*a*b**2*d*g**3 - B*a*b**2*d*g**3 + B*b**3*c*g**3)/(12
*d) + x**2*(12*A*a**2*b*d**2*g**3 - 3*B*a**2*b*d**2*g**3 + 4*B*a*b**2*c*d*g
**3 - B*b**3*c**2*g**3)/(8*d**2) + x*(4*A*a**3*d**3*g**3 - 3*B*a**3*d**3*g*
*3 + 6*B*a**2*b*c*d**2*g**3 - 4*B*a*b**2*c**2*d*g**3 + B*b**3*c**3*g**3)/(4
*d**3)
```

Giac [B] time = 20.9284, size = 460, normalized size = 3.09

$$-\frac{Ba^4g^3\log\left(bx+a\right)}{4\,b} + \frac{1}{4}\left(Ab^3g^3+Bb^3g^3\right)x^4 + \frac{\left(Bb^3cg^3+12\,Aab^2dg^3+11\,Bab^2dg^3\right)x^3}{12\,d} + \frac{1}{4}\left(Bb^3g^3x^4+4\,Bab^2g^3x^3+6\,B\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] -1/4*B*a^4*g^3*log(b*x + a)/b + 1/4*(A*b^3*g^3 + B*b^3*g^3)*x^4 + 1/12*(B*b
^3*c*g^3 + 12*A*a*b^2*d*g^3 + 11*B*a*b^2*d*g^3)*x^3/d + 1/4*(B*b^3*g^3*x^4
+ 4*B*a*b^2*g^3*x^3 + 6*B*a^2*b*g^3*x^2 + 4*B*a^3*g^3*x)*log((d*x + c)/(b*x
 + a)) - 1/8*(B*b^3*c^2*g^3 - 4*B*a*b^2*c*d*g^3 - 12*A*a^2*b*d^2*g^3 - 9*B*
a^2*b*d^2*g^3)*x^2/d^2 + 1/4*(B*b^3*c^3*g^3 - 4*B*a*b^2*c^2*d*g^3 + 6*B*a^2
```

```
*b*c*d^2*g^3 + 4*A*a^3*d^3*g^3 + B*a^3*d^3*g^3)*x/d^3 - 1/4*(B*b^3*c^4*g^3
- 4*B*a*b^2*c^3*d*g^3 + 6*B*a^2*b*c^2*d^2*g^3 - 4*B*a^3*c*d^3*g^3)*log(-d*x
 - c)/d^4
```

3.175 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right) dx$

Optimal. Leaf size=118

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3b}-\frac{Bg^2x(bc-ad)^2}{3d^2}+\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

```
[Out] -(B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2)/(6*b*d)
+ (B*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3) + (g^2*(a + b*x)^3*(A + B*Lo
g[(e*(c + d*x))/(a + b*x)]))/(3*b)
```

Rubi [A] time = 0.0806846, antiderivative size = 118, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3b}-\frac{Bg^2x(bc-ad)^2}{3d^2}+\frac{Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2(a+bx)^2(bc-ad)}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] -(B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2)/(6*b*d)
+ (B*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3) + (g^2*(a + b*x)^3*(A + B*Lo
g[(e*(c + d*x))/(a + b*x)]))/(3*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b} - \frac{B\int \frac{(-bc+ad)g^3(a+bx)^2}{c+dx}dx}{3bg}$$
$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b} + \frac{\left(B(bc-ad)g^2\right)\int \frac{(a+bx)^2}{c+dx}dx}{3b}$$
$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b} + \frac{\left(B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{d^2}+\frac{b(a+bx)}{d}+\right.}{3b}$$
$$= -\frac{B(bc-ad)^2g^2x}{3d^2} + \frac{B(bc-ad)g^2(a+bx)^2}{6bd} + \frac{B(bc-ad)^3g^2\log(c+dx)}{3bd^3} + $$

Mathematica [A] time = 0.0506713, size = 99, normalized size = 0.84

$$\frac{g^2\left(\frac{B(bc-ad)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{2d^3}+(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g^2*((B*(b*c - a*d)*(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c -
 a*d)^2*Log[c + d*x]))/(2*d^3) + (a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a +
b*x)])))/(3*b)
```

Maple [B] time = 0.159, size = 1537, normalized size = 13.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] -1/3/b*e^3*B*g^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(-e/(b*x+a)*a*d+b*e/(b
*x+a)*c)^3*a^3+1/3/b*e^3*B*g^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(-e/(b*x
+a)*a*d+b*e/(b*x+a)*c)^3*a^6/(b*x+a)^3+1/3*b^5*e^3*B*g^2*ln(d*e/b-e*(a*d-b*
c)/b/(b*x+a))/d^3/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^6/(b*x+a)^3-b*e^3*B*g^
2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^2*a*d-
20/3*b^2*e^3*B*g^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x
+a)*c)^3*a^3/(b*x+a)^3*c^3-B*g^2/d*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*
a^2*c+1/3*b^2*e^3*A*g^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^3-1/3*b^2*B*g^2/
d^3*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*c^3-e*B*g^2/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)*a^2*c-2*b^4*e^3*B*g^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d^2/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)^3*a*c^5/(b*x+a)^3+5*b*e^3*B*g^2*ln(d*e/b-e*(a*d-b
*c)/b/(b*x+a))*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^4/(b*x+a)^3*c^2+1/2*e^2
*B*g^2*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^2*c+5*b^3*e^3*B*g^2*ln(d*e/b-e*
(a*d-b*c)/b/(b*x+a))/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^2*c^4/(b*x+a)^3+e
^3*B*g^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)
^3*a^2*c+b*e*B*g^2/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*c^2*a-b*e^3*A*g^2/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)^3*a*c^2*d-1/3*b^2*e*B*g^2/d^2/(-e/(b*x+a)*a*d+b*e
/(b*x+a)*c)*c^3+1/3/b*e*B*g^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^3*d-1/3/b*e^
3*A*g^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^3*d^3-1/6/b*e^2*B*g^2*d^2/(-e/(b
*x+a)*a*d+b*e/(b*x+a)*c)^2*a^3-1/2*b*e^2*B*g^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*
c)^2*a*c^2+1/6*b^2*e^2*B*g^2/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*c^3+b*B*g^2
/d^2*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a*c^2+1/3*b^2*e^3*B*g^2*ln(d*e
/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*c^3+e^3*A*g^2/(-
e/(b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^2*c*d^2+1/3/b*B*g^2*ln(b*(d*e/b-e*(a*d-b*c
)/b/(b*x+a))-d*e)*a^3-2*e^3*B*g^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)^3*a^5/(b*x+a)^3*c
```

Maxima [B] time = 1.20332, size = 375, normalized size = 3.18

$$\frac{1}{3}Ab^2g^2x^3 + Aabg^2x^2 + \left(x\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right) - \frac{a\log(bx+a)}{b} + \frac{c\log(dx+c)}{d}\right)Ba^2g^2 + \left(x^2\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right) + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(d*e*x/(b*x + a) + c*e/(b*x + a))
 - a*log(b*x + a)/b + c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(d*e*x/(b*x + a
) + c*e/(b*x + a)) + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a
```

```
*d)*x/(b*d))*B*a*b*g^2 + 1/6*(2*x^3*log(d*e*x/(b*x + a) + c*e/(b*x + a)) -
2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2
- 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

Fricas [B] time = 1.06778, size = 467, normalized size = 3.96

$$\frac{2\,Ab^3d^3g^2x^3 - 2\,Ba^3d^3g^2\log(bx+a) + \left(Bb^3cd^2 + (6\,A-B)ab^2d^3\right)g^2x^2 - 2\left(Bb^3c^2d - 3\,Bab^2cd^2 - (3\,A-2\,B)a^2bd^3\right)g^2}{6\,bd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 - 2*B*a^3*d^3*g^2*log(b*x + a) + (B*b^3*c*d^2 + (6
*A - B)*a*b^2*d^3)*g^2*x^2 - 2*(B*b^3*c^2*d - 3*B*a*b^2*c*d^2 - (3*A - 2*B)
*a^2*b*d^3)*g^2*x + 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*l
og(d*x + c) + 2*(B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*
g^2*x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^3)
```

Sympy [B] time = 4.00286, size = 503, normalized size = 4.26

$$\frac{Ab^2g^2x^3}{3} - \frac{Ba^3g^2\log\left(x + \frac{\frac{Ba^4d^3g^2}{b} + 3Ba^3cd^2g^2 - 3Ba^2bc^2dg^2 + Bab^2c^3g^2}{Ba^3d^3g^2 + 3Ba^2bcd^2g^2 - 3Bab^2c^2dg^2 + Bb^3c^3g^2}\right)}{3b} + \frac{Bcg^2\left(3a^2d^2 - 3abcd + b^2c^2\right)\log\left(x + \frac{4Ba^3cd^2g^2 - 3Ba^2bc^2d}{}\right.}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b**2*g**2*x**3/3 - B*a**3*g**2*log(x + (B*a**4*d**3*g**2/b + 3*B*a**3*c*d
**2*g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2)/(B*a**3*d**3*g**2 +
 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**2 + B*b**3*c**3*g**2))/(3*b)
 + B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (4*B*a**3*c*d**2*
g**2 - 3*B*a**2*b*c**2*d*g**2 + B*a*b**2*c**3*g**2 - B*a*c*g**2*(3*a**2*d**
2 - 3*a*b*c*d + b**2*c**2) + B*b*c**2*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*
c**2)/d)/(B*a**3*d**3*g**2 + 3*B*a**2*b*c*d**2*g**2 - 3*B*a*b**2*c**2*d*g**
2 + B*b**3*c**3*g**2))/(3*d**3) + (B*a**2*g**2*x + B*a*b*g**2*x**2 + B*b**2
*g**2*x**3/3)*log(e*(c + d*x)/(a + b*x)) + x**2*(6*A*a*b*d*g**2 - B*a*b*d*g
```

```
**2 + B*b**2*c*g**2)/(6*d) + x*(3*A*a**2*d**2*g**2 - 2*B*a**2*d**2*g**2 + 3
*B*a*b*c*d*g**2 - B*b**2*c**2*g**2)/(3*d**2)
```

Giac [B] time = 4.9494, size = 305, normalized size = 2.58

$$-\frac{Ba^3g^2\log(bx+a)}{3\,b}+\frac{1}{3}\left(Ab^2g^2+Bb^2g^2\right)x^3+\frac{\left(Bb^2cg^2+6\,Aabdg^2+5\,Babdg^2\right)x^2}{6\,d}+\frac{1}{3}\left(Bb^2g^2x^3+3\,Babg^2x^2+3\,Ba^2g^2x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] -1/3*B*a^3*g^2*log(b*x + a)/b + 1/3*(A*b^2*g^2 + B*b^2*g^2)*x^3 + 1/6*(B*b^
2*c*g^2 + 6*A*a*b*d*g^2 + 5*B*a*b*d*g^2)*x^2/d + 1/3*(B*b^2*g^2*x^3 + 3*B*a
*b*g^2*x^2 + 3*B*a^2*g^2*x)*log((d*x + c)/(b*x + a)) - 1/3*(B*b^2*c^2*g^2 -
 3*B*a*b*c*d*g^2 - 3*A*a^2*d^2*g^2 - B*a^2*d^2*g^2)*x/d^2 + 1/3*(B*b^2*c^3*
g^2 - 3*B*a*b*c^2*d*g^2 + 3*B*a^2*c*d^2*g^2)*log(d*x + c)/d^3
```

3.176 $\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\,dx$

Optimal. Leaf size=81

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}+\frac{Bgx(bc-ad)}{2d}$$

```
[Out] (B*(b*c - a*d)*g*x)/(2*d) - (B*(b*c - a*d)^2*g*Log[c + d*x])/(2*b*d^2) + (g
*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*b)
```

Rubi [A] time = 0.0547031, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{2bd^2}+\frac{Bgx(bc-ad)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (B*(b*c - a*d)*g*x)/(2*d) - (B*(b*c - a*d)^2*g*Log[c + d*x])/(2*b*d^2) + (g
*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)dx &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b}-\frac{B\int \frac{(bc-ad)g^2(-a-bx)}{c+dx}dx}{2bg}\\ &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b}-\frac{(B(bc-ad)g)\int \frac{-a-bx}{c+dx}dx}{2b}\\ &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b}-\frac{(B(bc-ad)g)\int \left(-\frac{b}{d}+\frac{bc-ad}{d(c+dx)}\right)dx}{2b}\\ &= \frac{B(bc-ad)gx}{2d}-\frac{B(bc-ad)^2g\log(c+dx)}{2bd^2}+\frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2b}\end{aligned}$$

Mathematica [A] time = 0.0369662, size = 69, normalized size = 0.85

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+\frac{B(bc-ad)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] (g*((B*(b*c - a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2 + (a + b*x)^2
*(A + B*Log[(e*(c + d*x))/(a + b*x)])))/(2*b)
```

Maple [B] time = 0.161, size = 951, normalized size = 11.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] 1/2/b*e^2*A*g/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^2*d^2-e^2*A*g/(-e/(b*x+a)*
a*d+b*e/(b*x+a)*c)^2*a*d*c+1/2*b*e^2*A*g/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*c
^2+1/2/b*B*g*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a^2-B*g/d*ln(b*(d*e/b-
e*(a*d-b*c)/b/(b*x+a))-d*e)*a*c+1/2*b*B*g/d^2*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*
x+a))-d*e)*c^2+1/2/b*e*B*g/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*a^2*d-e*B*g/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)*a*c+1/2*b*e*B*g/d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)*
c^2+1/2/b*e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(b*x+a)*a*d+b*e/(
b*x+a)*c)^2*a^2-e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d/(-e/(b*x+a)*a*d+b
*e/(b*x+a)*c)^2*a*c-1/2/b*e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(-e/(
b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^4/(b*x+a)^2+2*e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/
(b*x+a))*d/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^3/(b*x+a)^2*c-3*b*e^2*B*g*ln(
d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*a^2/(b*x+a)^2
*c^2+2*b^2*e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/d/(-e/(b*x+a)*a*d+b*e/(b
*x+a)*c)^2*a/(b*x+a)^2*c^3+1/2*b*e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(-
e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*c^2-1/2*b^3*e^2*B*g*ln(d*e/b-e*(a*d-b*c)/b/(
b*x+a))/d^2/(-e/(b*x+a)*a*d+b*e/(b*x+a)*c)^2*c^4/(b*x+a)^2
```

Maxima [A] time = 1.16557, size = 193, normalized size = 2.38

$$\frac{1}{2}\,Abgx^2 + \left(x\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right) - \frac{a\log(bx+a)}{b} + \frac{c\log(dx+c)}{d}\right)Bag + \frac{1}{2}\left(x^2\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right) + \frac{a^2\log(bx}{b^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b
+ c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) +
 a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*B*b*g +
 A*a*g*x
```

Fricas [A] time = 1.0672, size = 278, normalized size = 3.43

$$\frac{Ab^2d^2gx^2 - Ba^2d^2g\log(bx+a) + \left(Bb^2cd + (2A-B)abd^2\right)gx - \left(Bb^2c^2 - 2\,Babcd\right)g\log(dx+c) + \left(Bb^2d^2gx^2 + 2\,Babd^2\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 - B*a^2*d^2*g*log(b*x + a) + (B*b^2*c*d + (2*A - B)*a*
b*d^2)*g*x - (B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^2 +
2*B*a*b*d^2*g*x)*log((d*e*x + c*e)/(b*x + a)))/(b*d^2)
```

Sympy [B] time = 2.54912, size = 257, normalized size = 3.17

$$\frac{Abgx^2}{2} - \frac{Ba^2g\log\left(x + \frac{\frac{Ba^3d^2g}{b}+2Ba^2cdg-Babc^2g}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{2b} + \frac{Bcg\left(2ad-bc\right)\log\left(x + \frac{3Ba^2cdg-Babc^2g-Bacg(2ad-bc)+\frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g+2Babcdg-Bb^2c^2g}\right)}{2d^2} + \Big(Bagx +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] A*b*g*x**2/2 - B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/(2*b) + B*c*g*(2*a*
d - b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B
*b*c**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))
/(2*d**2) + (B*a*g*x + B*b*g*x**2/2)*log(e*(c + d*x)/(a + b*x)) + x*(2*A*a*
d*g - B*a*d*g + B*b*c*g)/(2*d)
```

Giac [A] time = 2.27699, size = 153, normalized size = 1.89

$$-\frac{Ba^2g\log\left(bx+a\right)}{2\,b} + \frac{1}{2}\left(Abg + Bbg\right)x^2 + \frac{1}{2}\left(Bbgx^2 + 2\,Bagx\right)\log\left(\frac{dx+c}{bx+a}\right) + \frac{\left(Bbcg + 2\,Aadg + Badg\right)x}{2\,d} - \frac{\Big(Bbc^2g - 2\,B}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] -1/2*B*a^2*g*log(b*x + a)/b + 1/2*(A*b*g + B*b*g)*x^2 + 1/2*(B*b*g*x^2 + 2*
B*a*g*x)*log((d*x + c)/(b*x + a)) + 1/2*(B*b*c*g + 2*A*a*d*g + B*a*d*g)*x/d
 - 1/2*(B*b*c^2*g - 2*B*a*c*d*g)*log(-d*x - c)/d^2
```

3.177 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=81

$$-\frac{B\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/
(b*g)) - (B*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*g)
```

Rubi [A] time = 0.211494, antiderivative size = 122, normalized size of antiderivative = 1.51, number of steps used = 10, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg}-\frac{B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}+\frac{B\log^2(g(a+bx))}{2bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x),x]
```

```
[Out] (B*Log[g*(a + b*x)]^2)/(2*b*g) - (B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g
+ b*g*x])/(b*g) + ((A + B*Log[(e*(c + d*x))/(a + b*x)])*Log[a*g + b*g*x])/(
b*g) - (B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\log(ag+bgx)}{e(c+dx)}dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\log(ag+bgx)}{c+dx}dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \left(-\frac{be\log(ag+bgx)}{a+bx}+\frac{de\log(ag+bgx)}{c+dx}\right)dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} + \frac{B\int \frac{\log(ag+bgx)}{a+bx}dx}{g} - \frac{(Bd)\int \frac{\log(ag+bgx)}{c+dx}dx}{bg}$$

$$= -\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} + B\int \frac{\log\left(\frac{bg(c+dx)}{bcg-adg}\right)}{ag+bgx}$$

$$= -\frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} + \frac{B\,\text{Subst}\left(\int \frac{\log(x)}{x}d\right.}{bg}$$

$$= \frac{B\log^2(g(a+bx))}{2bg} - \frac{B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{bg} -$$

Mathematica [A] time = 0.0427005, size = 95, normalized size = 1.17

$$\frac{\log(g(a+bx))\left(2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)-B\log\left(\frac{b(c+dx)}{bc-ad}\right)+A\right)+B\log(g(a+bx))\right)-2B\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)}{2bg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x),x]
```

```
[Out] (Log[g*(a + b*x)]*(B*Log[g*(a + b*x)] + 2*(A - B*Log[(b*(c + d*x))/(b*c - a
*d)] + B*Log[(e*(c + d*x))/(a + b*x)])) - 2*B*PolyLog[2, (d*(a + b*x))/(-(b
*c) + a*d)])/(2*b*g)
```

Maple [B] time = 0.057, size = 419, normalized size = 5.2

$$-\frac{Aad}{bg(ad-bc)}\ln\left(b\left(\frac{de}{b}-\frac{e(ad-bc)}{b(bx+a)}\right)-de\right)+\frac{Ac}{g(ad-bc)}\ln\left(b\left(\frac{de}{b}-\frac{e(ad-bc)}{b(bx+a)}\right)-de\right)-\frac{Bad}{bg(ad-bc)}\text{dilog}\left(-\frac{1}{de}\left(b\left(\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x)
```

```
[Out] -1/b/g/(a*d-b*c)*A*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a*d+1/g/(a*d-b*c
)*A*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*c-1/b/g/(a*d-b*c)*B*dilog(-(b*(
d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)/d/e)*a*d+1/g/(a*d-b*c)*B*dilog(-(b*(d*e/b
-e*(a*d-b*c)/b/(b*x+a))-d*e)/d/e)*c-1/b/g/(a*d-b*c)*B*ln(d*e/b-e*(a*d-b*c)/
b/(b*x+a))*ln(-(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)/d/e)*a*d+1/g/(a*d-b*c)
*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*ln(-(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e
)/d/e)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$B\left(\frac{\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int-\frac{bdx\log\left(e\right)+bc\log\left(e\right)-\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^2dgx^2+abcg+\left(b^2cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+ag\right)}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] B*(log(b*x + a)*log(d*x + c)/(b*g) - integrate(-(b*d*x*log(e) + b*c*log(e)
- (2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a
*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(\frac{dex+ce}{bx+a}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B*log((d*e*x + c*e)/(b*x + a)) + A)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(dx+c)e}{bx+a}\right)+A}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)*e/(b*x + a)) + A)/(b*g*x + a*g), x)
```

3.178 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=64

$$-\frac{A-B}{bg^2(a+bx)}-\frac{B(c+dx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{g^2(a+bx)(bc-ad)}$$

```
[Out] -((A - B)/(b*g^2*(a + b*x))) - (B*(c + d*x)*Log[(e*(c + d*x))/(a + b*x)])/(
(b*c - a*d)*g^2*(a + b*x))
```

Rubi [A] time = 0.0767233, antiderivative size = 101, normalized size of antiderivative = 1.58, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{bg^2(a+bx)}+\frac{Bd\log(a+bx)}{bg^2(bc-ad)}-\frac{Bd\log(c+dx)}{bg^2(bc-ad)}+\frac{B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] B/(b*g^2*(a + b*x)) + (B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (B*d*Log[c +
 d*x])/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(b*g^2*(a
 + b*x))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)}+\frac{B\int\frac{-bc+ad}{g(a+bx)^2(c+dx)}\,dx}{bg}\\
&= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2}\\
&= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2}-\frac{bd}{(bc-ad)^2(a+bx)}+\frac{d^2}{(bc-ad)^2(c+dx)}\right)dx}{bg^2}\\
&= \frac{B}{bg^2(a+bx)}+\frac{Bd\log(a+bx)}{b(bc-ad)g^2}-\frac{Bd\log(c+dx)}{b(bc-ad)g^2}-\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{bg^2(a+bx)}
\end{aligned}$$

Mathematica [A] time = 0.0593092, size = 86, normalized size = 1.34

$$\frac{-(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A-B\right)-Bd(a+bx)\log(c+dx)+Bd(a+bx)\log(a+bx)}{bg^2(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^2,x]
```

```
[Out] (B*d*(a + b*x)*Log[a + b*x] - B*d*(a + b*x)*Log[c + d*x] - (b*c - a*d)*(A -
 B + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^2*(a + b*x))
```

Maple [B] time = 0.051, size = 520, normalized size = 8.1

$$\frac{Ad^2a}{b\,(ad-bc)^2\,g^2}-\frac{Adc}{(ad-bc)^2\,g^2}-\frac{Aa^2d^2}{b\,(ad-bc)^2\,g^2\,(bx+a)}+2\,\frac{Aadc}{(ad-bc)^2\,g^2\,(bx+a)}-\frac{bAc^2}{(ad-bc)^2\,g^2\,(bx+a)}+\frac{Bd^2a}{b\,(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x)
```

```
[Out] 1/b/(a*d-b*c)^2/g^2*A*d^2*a-1/(a*d-b*c)^2/g^2*A*d*c-1/b/(a*d-b*c)^2/g^2*A/(
b*x+a)*a^2*d^2+2/(a*d-b*c)^2/g^2*A/(b*x+a)*a*d*c-b/(a*d-b*c)^2/g^2*A/(b*x+a
)*c^2+1/b/(a*d-b*c)^2/g^2*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2*a-1/(a*d-b*
c)^2/g^2*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d*c-1/b/(a*d-b*c)^2/g^2*B*ln(d*e
/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*a^2*d^2+2/(a*d-b*c)^2/g^2*B*ln(d*e/b-e*(a
*d-b*c)/b/(b*x+a))/(b*x+a)*a*d*c-b/(a*d-b*c)^2/g^2*B*ln(d*e/b-e*(a*d-b*c)/b
/(b*x+a))/(b*x+a)*c^2+1/b/(a*d-b*c)^2/g^2*B/(b*x+a)*a^2*d^2-2/(a*d-b*c)^2/g
^2*B/(b*x+a)*a*d*c+b/(a*d-b*c)^2/g^2*B/(b*x+a)*c^2-1/b/(a*d-b*c)^2/g^2*B*d^
2*a+1/(a*d-b*c)^2/g^2*B*d*c
```

Maxima [B] time = 1.11624, size = 181, normalized size = 2.83

$$-B\left(\frac{\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)}{b^2g^2x+abg^2}-\frac{1}{b^2g^2x+abg^2}-\frac{d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}+\frac{d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)-\frac{A}{b^2g^2x+abg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x, algorithm="maxima")
```

```
[Out] -B*(log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^2*g^2*x + a*b*g^2) - 1/(b^2*g^2
*x + a*b*g^2) - d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + d*log(d*x + c)/((b^2
*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.01728, size = 177, normalized size = 2.77

$$-\frac{(A-B)bc-(A-B)ad+(Bbdx+Bbc)\log\left(\frac{dex+ce}{bx+a}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x, algorithm="fricas")
```

```
[Out] -((A - B)*b*c - (A - B)*a*d + (B*b*d*x + B*b*c)*log((d*e*x + c*e)/(b*x + a)
))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d)*g^2)
```

Sympy [B] time = 1.8312, size = 231, normalized size = 3.61

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{abg^2+b^2g^2x}+\frac{Bd\log\left(x+\frac{-\frac{Ba^2d^3}{ad-bc}+\frac{2Babcd^2}{ad-bc}+Bad^2-\frac{Bb^2c^2d}{ad-bc}+Bbcd}{2Bbd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{Bd\log\left(x+\frac{\frac{Ba^2d^3}{ad-bc}-\frac{2Babcd^2}{ad-bc}+Bad^2+\frac{Bb^2c^2d}{ad-bc}+Bbcd}{2Bbd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{A-B}{abg^2+b^2g^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(a*b*g**2 + b**2*g**2*x) + B*d*log(x + (-B*a*
*2*d**3/(a*d - b*c) + 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 - B*b**2*c**2*d
/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) - B*d*log(x + (B
*a**2*d**3/(a*d - b*c) - 2*B*a*b*c*d**2/(a*d - b*c) + B*a*d**2 + B*b**2*c**
2*d/(a*d - b*c) + B*b*c*d)/(2*B*b*d**2))/(b*g**2*(a*d - b*c)) - (A - B)/(a*
b*g**2 + b**2*g**2*x)
```

Giac [A] time = 1.32796, size = 151, normalized size = 2.36

$$\frac{Bd\log\left(bx+a\right)}{b^2cg^2-abdg^2}-\frac{Bd\log\left(dx+c\right)}{b^2cg^2-abdg^2}-\frac{B\log\left(\frac{dx+c}{bx+a}\right)}{b^2g^2x+abg^2}-\frac{A}{b^2g^2x+abg^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] B*d*log(b*x + a)/(b^2*c*g^2 - a*b*d*g^2) - B*d*log(d*x + c)/(b^2*c*g^2 - a*
b*d*g^2) - B*log((d*x + c)/(b*x + a))/(b^2*g^2*x + a*b*g^2) - A/(b^2*g^2*x
+ a*b*g^2)
```

3.179 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=144

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}-\frac{Bd}{2bg^3(a+bx)(bc-ad)}+\frac{B}{4bg^3(a+bx)^2}$$

```
[Out] B/(4*b*g^3*(a + b*x)^2) - (B*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Lo
g[a + b*x])/(2*b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*x])/(2*b*(b*c - a*d)
^2*g^3) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(2*b*g^3*(a + b*x)^2)
```

Rubi [A] time = 0.104102, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{2bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{2bg^3(bc-ad)^2}-\frac{Bd}{2bg^3(a+bx)(bc-ad)}+\frac{B}{4bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] B/(4*b*g^3*(a + b*x)^2) - (B*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Lo
g[a + b*x])/(2*b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*x])/(2*b*(b*c - a*d)
^2*g^3) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(2*b*g^3*(a + b*x)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^3}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{-bc+ad}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{2bg^3}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}-\frac{d^3}{(bc-ad)^3}\right.}{2bg^3}$$

$$= \frac{B}{4bg^3(a+bx)^2}-\frac{Bd}{2b(bc-ad)g^3(a+bx)}-\frac{Bd^2\log(a+bx)}{2b(bc-ad)^2g^3}+\frac{Bd^2\log(c+dx)}{2b(bc-ad)^2g^3}-\frac{A+B\log\left(\right.}{2bg^3(a+}$$

Mathematica [A] time = 0.0983657, size = 128, normalized size = 0.89

$$-\frac{(bc-ad)\left(-2aAd+2B(bc-ad)\log\left(\frac{e(c+dx)}{a+bx}\right)+3aBd+2Abc-bBc+2bBdx\right)-2Bd^2(a+bx)^2\log(c+dx)+2Bd^2(a+}{4bg^3(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^3,x]
```

```
[Out] -(2*B*d^2*(a + b*x)^2*Log[a + b*x] - 2*B*d^2*(a + b*x)^2*Log[c + d*x] + (b*
c - a*d)*(2*A*b*c - b*B*c - 2*a*A*d + 3*a*B*d + 2*b*B*d*x + 2*B*(b*c - a*d)
*Log[(e*(c + d*x))/(a + b*x)]))/(4*b*(b*c - a*d)^2*g^3*(a + b*x)^2)
```

Maple [B] time = 0.053, size = 753, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2/(a*d-b*c)^3/g^3*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2*c+1/2/b/(a*d-b*c
)^3/g^3*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3*a+1/2*b/(a*d-b*c)^3/g^3*B*d/(
b*x+a)*c^2+3/2/(a*d-b*c)^3/g^3*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*
a^2*d^2*c-3/2*b/(a*d-b*c)^3/g^3*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2
*a*d*c^2+1/4/b/(a*d-b*c)^3/g^3*B/(b*x+a)^2*a^3*d^3+1/2/b/(a*d-b*c)^3/g^3*B*
d^3/(b*x+a)*a^2+1/2*b^2/(a*d-b*c)^3/g^3*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(
b*x+a)^2*c^3-1/2/b/(a*d-b*c)^3/g^3*A/(b*x+a)^2*a^3*d^3-3/4/b/(a*d-b*c)^3/g^
3*B*d^3*a-1/4*b^2/(a*d-b*c)^3/g^3*B/(b*x+a)^2*c^3+1/2*b^2/(a*d-b*c)^3/g^3*A
/(b*x+a)^2*c^3+1/2/b/(a*d-b*c)^3/g^3*A*d^3*a-1/2/(a*d-b*c)^3/g^3*A*d^2*c+3/
4*b/(a*d-b*c)^3/g^3*B/(b*x+a)^2*a*d*c^2-3/2*b/(a*d-b*c)^3/g^3*A/(b*x+a)^2*a
*d*c^2-1/(a*d-b*c)^3/g^3*B*d^2/(b*x+a)*a*c+3/2/(a*d-b*c)^3/g^3*A/(b*x+a)^2*
a^2*d^2*c-3/4/(a*d-b*c)^3/g^3*B/(b*x+a)^2*a^2*d^2*c-1/2/b/(a*d-b*c)^3/g^3*B
*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*a^3*d^3+3/4/(a*d-b*c)^3/g^3*B*d^
2*c
```

Maxima [A] time = 1.24118, size = 344, normalized size = 2.39

$$-\frac{1}{4}B\left(\frac{2\,bdx - bc + 3\,ad}{\left(b^4c - ab^3d\right)g^3x^2 + 2\left(ab^3c - a^2b^2d\right)g^3x + \left(a^2b^2c - a^3bd\right)g^3} + \frac{2\,\log\left(\frac{dex}{bx+a} + \frac{ce}{bx+a}\right)}{b^3g^3x^2 + 2\,ab^2g^3x + a^2bg^3} + \frac{2\,d^2\log\left(bx+a\right)}{\left(b^3c^2 - 2\,ab^2cd + a^2bd\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x, algorithm="maxima")
```

```
[Out] -1/4*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a
^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*log(d*e*x/(b*x + a) + c*e/
(b*x + a))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/(
(b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2
*a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*
g^3)
```

Fricas [A] time = 1.02353, size = 455, normalized size = 3.16

$$-\frac{(2\,A-B)b^2c^2 - 4\,(A-B)abcd + (2\,A-3\,B)a^2d^2 + 2\left(Bb^2cd - Babd^2\right)x - 2\left(Bb^2d^2x^2 + 2\,Babd^2x - Bb^2c^2 + 2\,Babcd\right)\log}{4\left(\left(b^5c^2 - 2\,ab^4cd + a^2b^3d^2\right)g^3x^2 + 2\left(ab^4c^2 - 2\,a^2b^3cd + a^3b^2d^2\right)g^3x + \left(a^2b^3c^2 - 2\,a^3b^2cd + a^4bd^2\right)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*A - B)*b^2*c^2 - 4*(A - B)*a*b*c*d + (2*A - 3*B)*a^2*d^2 + 2*(B*b^
2*c*d - B*a*b*d^2)*x - 2*(B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a
*b*c*d)*log((d*e*x + c*e)/(b*x + a)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2
)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^
2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 3.23947, size = 422, normalized size = 2.93

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}+\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{2bg^3(ad-bc)^2}-\frac{Bd^2\log\left(x+\frac{\frac{Ba^3d^5}{(ad-bc)^2}-\frac{3Ba^2bcd^4}{(ad-bc)^2}}{}\right.}{2bg^3(a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b**3*g**
3*x**2) + B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*d**4/(
a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b**3*c**
3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2)
 - B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d - b*
c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d**2/(
a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + (-2*A
*a*d + 2*A*b*c + 3*B*a*d - B*b*c + 2*B*b*d*x)/(4*a**3*b*d*g**3 - 4*a**2*b**
2*c*g**3 + x**2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 -
 8*a*b**3*c*g**3))
```

Giac [A] time = 1.3898, size = 327, normalized size = 2.27

$$-\frac{Bd^2\log(bx+a)}{2\left(b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3\right)}+\frac{Bd^2\log(dx+c)}{2\left(b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3\right)}-\frac{B\log\left(\frac{dx+c}{bx+a}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}-\frac{}{4\left(b^4cg^3x^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] -1/2*B*d^2*log(b*x + a)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) + 1
/2*B*d^2*log(d*x + c)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/2
*B*log((d*x + c)/(b*x + a))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) - 1/4
*(2*B*b*d*x + 2*A*b*c + B*b*c - 2*A*a*d + B*a*d)/(b^4*c*g^3*x^2 - a*b^3*d*g
^3*x^2 + 2*a*b^3*c*g^3*x - 2*a^2*b^2*d*g^3*x + a^2*b^2*c*g^3 - a^3*b*d*g^3)
```

3.180 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=175

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{3bg^4(a+bx)^3}+\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}+\frac{\cdots}{9bg^4(a\cdots}$$

```
[Out] B/(9*b*g^4*(a + b*x)^3) - (B*d)/(6*b*(b*c - a*d)*g^4*(a + b*x)^2) + (B*d^2)
/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (B*d^3*Log[a + b*x])/(3*b*(b*c - a*d)^
3*g^4) - (B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(c +
d*x))/(a + b*x)])/(3*b*g^4*(a + b*x)^3)
```

Rubi [A] time = 0.131136, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{3bg^4(a+bx)^3}+\frac{Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd}{6bg^4(a+bx)^2(bc-ad)}+\frac{\cdots}{9bg^4(a\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^4,x]
```


```
[Out] B/(9*b*g^4*(a + b*x)^3) - (B*d)/(6*b*(b*c - a*d)*g^4*(a + b*x)^2) + (B*d^2)
/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (B*d^3*Log[a + b*x])/(3*b*(b*c - a*d)^
3*g^4) - (B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(c +
d*x))/(a + b*x)])/(3*b*g^4*(a + b*x)^3)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^4}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bg^4(a+bx)^3}+\frac{B\int \frac{-bc+ad}{g^3(a+bx)^4(c+dx)}\,dx}{3bg} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bg^4(a+bx)^3}-\frac{(B(bc-ad))\int \frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bg^4(a+bx)^3}-\frac{(B(bc-ad))\int \left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)^2}-\frac{bd^3}{(bc-ad)^4(\cdots}\right.}{3bg^4} \\
&= \frac{B}{9bg^4(a+bx)^3}-\frac{Bd}{6b(bc-ad)g^4(a+bx)^2}+\frac{Bd^2}{3b(bc-ad)^2g^4(a+bx)}+\frac{Bd^3\log(a+bx)}{3b(bc-ad)^3g^4}-\frac{Bd^3\,\mathrm{l}\cdots}{3b(b\cdots}
\end{aligned}$$

Mathematica [A] time = 0.157511, size = 141, normalized size = 0.81

$$\frac{\frac{B\left((bc-ad)\left(11a^2d^2+abd(15dx-7c)+b^2\left(2c^2-3cdx+6d^2x^2\right)\right)-6d^3(a+bx)^3\log(c+dx)+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}-6\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{18bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^4,x]
```

```
[Out] ((B*((b*c - a*d)*(11*a^2*d^2 + a*b*d*(-7*c + 15*d*x) + b^2*(2*c^2 - 3*c*d*x
 + 6*d^2*x^2)) + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c +
 d*x]))/(b*c - a*d)^3 - 6*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(18*b*g^4*(
a + b*x)^3)
```

Maple [B] time = 0.056, size = 1012, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3/b/(a*d-b*c)^4/g^4*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^4*d^4-
2*b/(a*d-b*c)^4/g^4*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^2*d^2*c^2
-1/3/(a*d-b*c)^4/g^4*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3*c+1/9*b^3/(a*d-b
*c)^4/g^4*B/(b*x+a)^3*c^4-1/3*b^3/(a*d-b*c)^4/g^4*A/(b*x+a)^3*c^4-1/2/(a*d-
b*c)^4/g^4*B*d^3/(b*x+a)^2*a^2*c+4/3*b^2/(a*d-b*c)^4/g^4*A/(b*x+a)^3*a*d*c^
3-4/9*b^2/(a*d-b*c)^4/g^4*B/(b*x+a)^3*c^3*a*d-4/9/(a*d-b*c)^4/g^4*B/(b*x+a)
^3*a^3*d^3*c-2/3/(a*d-b*c)^4/g^4*B*d^3/(b*x+a)*c*a+4/3*b^2/(a*d-b*c)^4/g^4*
B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a*d*c^3+4/3/(a*d-b*c)^4/g^4*B*l
n(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^3*d^3*c+1/2*b/(a*d-b*c)^4/g^4*B*
d^2/(b*x+a)^2*c^2*a-2*b/(a*d-b*c)^4/g^4*A/(b*x+a)^3*a^2*d^2*c^2+2/3*b/(a*d-
b*c)^4/g^4*B/(b*x+a)^3*a^2*d^2*c^2-11/18/b/(a*d-b*c)^4/g^4*B*d^4*a+1/3/b/(a
*d-b*c)^4/g^4*A*d^4*a+4/3/(a*d-b*c)^4/g^4*A/(b*x+a)^3*a^3*d^3*c-1/3/(a*d-b*
c)^4/g^4*A*d^3*c+1/6/b/(a*d-b*c)^4/g^4*B*d^4/(b*x+a)^2*a^3-1/6*b^2/(a*d-b*c
)^4/g^4*B*d/(b*x+a)^2*c^3+1/3/b/(a*d-b*c)^4/g^4*B*d^4/(b*x+a)*a^2+1/3/b/(a*
d-b*c)^4/g^4*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4*a-1/3*b^3/(a*d-b*c)^4/g^
4*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*c^4-1/3/b/(a*d-b*c)^4/g^4*A/(
b*x+a)^3*a^4*d^4+11/18/(a*d-b*c)^4/g^4*B*d^3*c+1/9/b/(a*d-b*c)^4/g^4*B/(b*x
+a)^3*a^4*d^4+1/3*b/(a*d-b*c)^4/g^4*B*d^2/(b*x+a)*c^2
```

Maxima [B] time = 1.26679, size = 578, normalized size = 3.3

$$\frac{1}{18}B\left(\frac{6\,b^2d^2x^2+2\,b^2c^2-7\,abcd+11\,a^2d^2-3\left(b^2cd-5\,abd^2\right)x}{\left(b^6c^2-2\,ab^5cd+a^2b^4d^2\right)g^4x^3+3\left(ab^5c^2-2\,a^2b^4cd+a^3b^3d^2\right)g^4x^2+3\left(a^2b^4c^2-2\,a^3b^3cd+a^4b^2d^2\right)g^4x+\left(a^3b^3c^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x, algorithm="maxima")
```

```
[Out] 1/18*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2
 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) - 6*log
```

```
(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^
2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d
 + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^
2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 1.02002, size = 826, normalized size = 4.72

$$-\frac{2\,(3\,A-B)b^3c^3-9\,(2\,A-B)ab^2c^2d+18\,(A-B)a^2bcd^2-(6\,A-11\,B)a^3d^3-6\left(Bb^3cd^2-Bab^2d^3\right)x^2+3\left(Bb^3c^2d-6\,Ba\right.}{18\left(\left(b^7c^3-3\,ab^6c^2d+3\,a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3\,a^2b^5c^2d+3\,a^3b^4cd^2-a^4b^3d^3\right)g^4x^2+3\left(a\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x, algorithm="fricas")
```

```
[Out] -1/18*(2*(3*A - B)*b^3*c^3 - 9*(2*A - B)*a*b^2*c^2*d + 18*(A - B)*a^2*b*c*d
^2 - (6*A - 11*B)*a^3*d^3 - 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 + 3*(B*b^3*c^
2*d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 6*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3
*x^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log
((d*e*x + c*e)/(b*x + a)))/((b^7*c^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^
3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4
*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^
5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b
*d^3)*g^4)
```

Sympy [B] time = 5.22966, size = 656, normalized size = 3.75

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}+\frac{Bd^3\log\left(x+\frac{-\frac{Ba^4d^7}{(ad-bc)^3}+\frac{4Ba^3bcd^6}{(ad-bc)^3}-\frac{6Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{4Bab^3c^3d^4}{(ad-bc)^3}+Bad^4-\frac{Bb^4c^4d^3}{(ad-bc)^3}+Bbcd^3}{2Bbd^4}\right)}{3bg^4\,(ad-bc)^3}-\frac{Bd^3\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9*a*b**
3*g**4*x**2 + 3*b**4*g**4*x**3) + B*d**3*log(x + (-B*a**4*d**7/(a*d - b*c)*
```

```
*3 + 4*B*a**3*b*c*d**6/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5/(a*d - b*c)
**3 + 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + B*a*d**4 - B*b**4*c**4*d**3/(a*
d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) - B*d**3*
log(x + (B*a**4*d**7/(a*d - b*c)**3 - 4*B*a**3*b*c*d**6/(a*d - b*c)**3 + 6*
B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4/(a*d - b*c)**3
+ B*a*d**4 + B*b**4*c**4*d**3/(a*d - b*c)**3 + B*b*c*d**3)/(2*B*b*d**4))/(3
*b*g**4*(a*d - b*c)**3) + (-6*A*a**2*d**2 + 12*A*a*b*c*d - 6*A*b**2*c**2 +
11*B*a**2*d**2 - 7*B*a*b*c*d + 2*B*b**2*c**2 + 6*B*b**2*d**2*x**2 + x*(15*B
*a*b*d**2 - 3*B*b**2*c*d))/(18*a**5*b*d**2*g**4 - 36*a**4*b**2*c*d*g**4 + 1
8*a**3*b**3*c**2*g**4 + x**3*(18*a**2*b**4*d**2*g**4 - 36*a*b**5*c*d*g**4 +
 18*b**6*c**2*g**4) + x**2*(54*a**3*b**3*d**2*g**4 - 108*a**2*b**4*c*d*g**4
 + 54*a*b**5*c**2*g**4) + x*(54*a**4*b**2*d**2*g**4 - 108*a**3*b**3*c*d*g**
4 + 54*a**2*b**4*c**2*g**4))
```

Giac [B] time = 1.39764, size = 609, normalized size = 3.48

$$\frac{Bd^3 \log (bx+a)}{3 \left(b^4c^3g^4 - 3\,ab^3c^2dg^4 + 3\,a^2b^2cd^2g^4 - a^3bd^3g^4\right)} - \frac{Bd^3 \log (dx+c)}{3 \left(b^4c^3g^4 - 3\,ab^3c^2dg^4 + 3\,a^2b^2cd^2g^4 - a^3bd^3g^4\right)} - \frac{B}{3 \left(b^4g^4x^3 + 3\,ab^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] 1/3*B*d^3*log(b*x + a)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g^4 + 3*a^2*b^2*c*d^2*g
^4 - a^3*b*d^3*g^4) - 1/3*B*d^3*log(d*x + c)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g
^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*log((d*x + c)/(b*x + a))/
(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 1/18*(6*B*b
^2*d^2*x^2 - 3*B*b^2*c*d*x + 15*B*a*b*d^2*x - 6*A*b^2*c^2 - 4*B*b^2*c^2 + 1
2*A*a*b*c*d + 5*B*a*b*c*d - 6*A*a^2*d^2 + 5*B*a^2*d^2)/(b^6*c^2*g^4*x^3 - 2
*a*b^5*c*d*g^4*x^3 + a^2*b^4*d^2*g^4*x^3 + 3*a*b^5*c^2*g^4*x^2 - 6*a^2*b^4*
c*d*g^4*x^2 + 3*a^3*b^3*d^2*g^4*x^2 + 3*a^2*b^4*c^2*g^4*x - 6*a^3*b^3*c*d*g
^4*x + 3*a^4*b^2*d^2*g^4*x + a^3*b^3*c^2*g^4 - 2*a^4*b^2*c*d*g^4 + a^5*b*d^
2*g^4)
```

3.181 $\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=206

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}-\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}-\frac{}{12bg^5(a}$$

```
[Out] B/(16*b*g^5*(a + b*x)^4) - (B*d)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3) + (B*d^
2)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3)/(4*b*(b*c - a*d)^3*g^5*(a
+ b*x)) - (B*d^4*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x
])/(4*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(4*b*g^5*
(a + b*x)^4)
```

Rubi [A] time = 0.14864, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^3}{4bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{8bg^5(a+bx)^2(bc-ad)^2}-\frac{Bd^4\log(a+bx)}{4bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{4bg^5(bc-ad)^4}-\frac{}{12bg^5(a}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] B/(16*b*g^5*(a + b*x)^4) - (B*d)/(12*b*(b*c - a*d)*g^5*(a + b*x)^3) + (B*d^
2)/(8*b*(b*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3)/(4*b*(b*c - a*d)^3*g^5*(a
+ b*x)) - (B*d^4*Log[a + b*x])/(4*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x
])/(4*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x))/(a + b*x)])/(4*b*g^5*
(a + b*x)^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(ag+bgx)^5}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4bg^5(a+bx)^4}+\frac{B\int\frac{-bc+ad}{g^4(a+bx)^5(c+dx)}\,dx}{4bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4bg^5(a+bx)^4}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^5(c+dx)}\,dx}{4bg^5}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{4bg^5(a+bx)^4}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^5}-\frac{bd}{(bc-ad)^2(a+bx)^4}+\frac{bd^2}{(bc-ad)^3(a+bx)^3}-\frac{b}{(bc-ad)}\right.}{4bg^5}$$

$$= \frac{B}{16bg^5(a+bx)^4}-\frac{Bd}{12b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2}{8b(bc-ad)^2g^5(a+bx)^2}-\frac{Bd^3}{4b(bc-ad)^3g^5(a+}$$

Mathematica [A] time = 0.202056, size = 166, normalized size = 0.81

$$\frac{\frac{B(ad-bc)\left(\frac{12d^3(bc-ad)}{a+bx}-\frac{6d^2(bc-ad)^2}{(a+bx)^2}+\frac{4d(bc-ad)^3}{(a+bx)^3}-\frac{3(bc-ad)^4}{(a+bx)^4}+12d^4\log(a+bx)-12d^4\log(c+dx)\right)}{12(bc-ad)^5}-\frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A}{(a+bx)^4}}{4bg^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])/(a*g + b*g*x)^5,x]
```

```
[Out] ((B*(-(b*c) + a*d)*((-3*(b*c - a*d)^4)/(a + b*x)^4 + (4*d*(b*c - a*d)^3)/(a
 + b*x)^3 - (6*d^2*(b*c - a*d)^2)/(a + b*x)^2 + (12*d^3*(b*c - a*d))/(a + b
*x) + 12*d^4*Log[a + b*x] - 12*d^4*Log[c + d*x]))/(12*(b*c - a*d)^5) - (A +
 B*Log[(e*(c + d*x))/(a + b*x)])/(a + b*x)^4)/(4*b*g^5)
```

Maple [B] time = 0.053, size = 1306, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x)
```

```
[Out] -1/4/(a*d-b*c)^5/g^5*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4*c+1/4*b^4/(a*d-b
*c)^5/g^5*A/(b*x+a)^4*c^5-1/16*b^4/(a*d-b*c)^5/g^5*B/(b*x+a)^4*c^5-5/4*b^3/
(a*d-b*c)^5/g^5*A/(b*x+a)^4*a*d*c^4-5/2*b/(a*d-b*c)^5/g^5*A/(b*x+a)^4*a^3*d
^3*c^2+5/8*b/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^3*d^3*c^2+5/4/(a*d-b*c)^5/g^5*B*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^4*d^4*c-1/4/b/(a*d-b*c)^5/g^5*B
*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^5*d^5+5/2*b^2/(a*d-b*c)^5/g^5*
A/(b*x+a)^4*a^2*d^2*c^3-5/8*b^2/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^2*d^2*c^3+5/1
6*b^3/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a*d*c^4+1/2*b/(a*d-b*c)^5/g^5*B*d^3/(b*x+
a)^3*a^2*c^2-1/3*b^2/(a*d-b*c)^5/g^5*B*d^2/(b*x+a)^3*a*c^3+3/8*b/(a*d-b*c)^
5/g^5*B*d^3/(b*x+a)^2*a*c^2-1/4/(a*d-b*c)^5/g^5*A*d^4*c-25/48/b/(a*d-b*c)^5
/g^5*B*d^5*a+25/48/(a*d-b*c)^5/g^5*B*d^4*c+1/4/b/(a*d-b*c)^5/g^5*B*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))*d^5*a+1/4*b^4/(a*d-b*c)^5/g^5*B*ln(d*e/b-e*(a*d-b*c
)/b/(b*x+a))/(b*x+a)^4*c^5+5/2*b^2/(a*d-b*c)^5/g^5*B*ln(d*e/b-e*(a*d-b*c)/b
/(b*x+a))/(b*x+a)^4*a^2*d^2*c^3-3/8/(a*d-b*c)^5/g^5*B*d^4/(b*x+a)^2*a^2*c-1
/2/(a*d-b*c)^5/g^5*B*d^4/(b*x+a)*a*c+1/4/b/(a*d-b*c)^5/g^5*B*d^5/(b*x+a)*a^
2+1/4*b/(a*d-b*c)^5/g^5*B*d^3/(b*x+a)*c^2+1/8/b/(a*d-b*c)^5/g^5*B*d^5/(b*x+
a)^2*a^3-1/8*b^2/(a*d-b*c)^5/g^5*B*d^2/(b*x+a)^2*c^3+1/12/b/(a*d-b*c)^5/g^5
*B*d^5/(b*x+a)^3*a^4+1/12*b^3/(a*d-b*c)^5/g^5*B*d/(b*x+a)^3*c^4+5/4/(a*d-b*
c)^5/g^5*A/(b*x+a)^4*a^4*d^4*c-1/4/b/(a*d-b*c)^5/g^5*A/(b*x+a)^4*a^5*d^5+1/
4/b/(a*d-b*c)^5/g^5*A*d^5*a-5/4*b^3/(a*d-b*c)^5/g^5*B*ln(d*e/b-e*(a*d-b*c)/
b/(b*x+a))/(b*x+a)^4*a*d*c^4-5/2*b/(a*d-b*c)^5/g^5*B*ln(d*e/b-e*(a*d-b*c)/b
/(b*x+a))/(b*x+a)^4*a^3*d^3*c^2+1/16/b/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^5*d^5-
5/16/(a*d-b*c)^5/g^5*B/(b*x+a)^4*a^4*d^4*c-1/3/(a*d-b*c)^5/g^5*B*d^4/(b*x+a
)^3*a^3*c
```

Maxima [B] time = 1.1692, size = 873, normalized size = 4.24

$$-\frac{1}{48}B\left(\frac{12\,b^3d^3x^3 - 3\,b^3c^3 + 13\,ab^2c^2d - 23\,a^2bcd^2 + 25\,a^3}{\left(b^8c^3 - 3\,ab^7c^2d + 3\,a^2b^6cd^2 - a^3b^5d^3\right)g^5x^4 + 4\left(ab^7c^3 - 3\,a^2b^6c^2d + 3\,a^3b^5cd^2 - a^4b^4d^3\right)g^5x^3 + 6\left(a^2b^6c^3 - 3\,a^3b^5\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x, algorithm="maxima")
```

```
[Out] -1/48*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25
*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3
)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)
*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3
)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^
5) + 12*log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/(
(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)
*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 1.10845, size = 1284, normalized size = 6.23

$$-\frac{3\,(4\,A-B)b^4c^4-16\,(3\,A-B)ab^3c^3d+36\,(2\,A-B)a^2b^2c^2d^2-48\,(A-B)a^3bcd^3+(12\,A-25\,B)a^4d^4+12\,\Bigl(Bb^4cd^3-B}{48\,\Bigl(\Bigl(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\Bigr)g^5x^4+4\,\Bigl(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6c^2d^2-4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x, algorithm="fricas")
```

```
[Out] -1/48*(3*(4*A - B)*b^4*c^4 - 16*(3*A - B)*a*b^3*c^3*d + 36*(2*A - B)*a^2*b^
2*c^2*d^2 - 48*(A - B)*a^3*b*c*d^3 + (12*A - 25*B)*a^4*d^4 + 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 + 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 12*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*
B*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3
*b*c*d^3)*log((d*e*x + c*e)/(b*x + a)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b
^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*
b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*
(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*
b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4
*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^
6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

Sympy [B] time = 7.93603, size = 944, normalized size = 4.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(c + d*x)/(a + b*x))/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x + 24*a**
2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) + B*d**4*log(x +
 (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10*B*a**
3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4 -
 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a*d - b
*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) - B*d**4*log(x
 + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 10*B*a*
*3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*c)**4
+ 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(a*d -
b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(4*b*g**5*(a*d - b*c)**4) + (-12*A*a**3
*d**3 + 36*A*a**2*b*c*d**2 - 36*A*a*b**2*c**2*d + 12*A*b**3*c**3 + 25*B*a**
3*d**3 - 23*B*a**2*b*c*d**2 + 13*B*a*b**2*c**2*d - 3*B*b**3*c**3 + 12*B*b**
3*d**3*x**3 + x**2*(42*B*a*b**2*d**3 - 6*B*b**3*c*d**2) + x*(52*B*a**2*b*d*
*3 - 20*B*a*b**2*c*d**2 + 4*B*b**3*c**2*d))/(48*a**7*b*d**3*g**5 - 144*a**6
*b**2*c*d**2*g**5 + 144*a**5*b**3*c**2*d*g**5 - 48*a**4*b**4*c**3*g**5 + x*
*4*(48*a**3*b**5*d**3*g**5 - 144*a**2*b**6*c*d**2*g**5 + 144*a*b**7*c**2*d*
g**5 - 48*b**8*c**3*g**5) + x**3*(192*a**4*b**4*d**3*g**5 - 576*a**3*b**5*c
*d**2*g**5 + 576*a**2*b**6*c**2*d*g**5 - 192*a*b**7*c**3*g**5) + x**2*(288*
a**5*b**3*d**3*g**5 - 864*a**4*b**4*c*d**2*g**5 + 864*a**3*b**5*c**2*d*g**5
 - 288*a**2*b**6*c**3*g**5) + x*(192*a**6*b**2*d**3*g**5 - 576*a**5*b**3*c*
d**2*g**5 + 576*a**4*b**4*c**2*d*g**5 - 192*a**3*b**5*c**3*g**5))
```

Giac [B] time = 1.35681, size = 967, normalized size = 4.69

$$-\frac{Bd^4 \log(bx+a)}{4\left(b^5c^4g^5 - 4\,ab^4c^3dg^5 + 6\,a^2b^3c^2d^2g^5 - 4\,a^3b^2cd^3g^5 + a^4bd^4g^5\right)} + \frac{Bd^4 \log(dx+c)}{4\left(b^5c^4g^5 - 4\,ab^4c^3dg^5 + 6\,a^2b^3c^2d^2g^5 - 4\,a^3b^2cd^3g^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] -1/4*B*d^4*log(b*x + a)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^
2*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) + 1/4*B*d^4*log(d*x + c)/(b^5*
```

```
c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^5 +
 a^4*b*d^4*g^5) - 1/4*B*log((d*x + c)/(b*x + a))/(b^5*g^5*x^4 + 4*a*b^4*g^5
*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/48*(12*B*b^3*d^
3*x^3 - 6*B*b^3*c*d^2*x^2 + 42*B*a*b^2*d^3*x^2 + 4*B*b^3*c^2*d*x - 20*B*a*b
^2*c*d^2*x + 52*B*a^2*b*d^3*x + 12*A*b^3*c^3 + 9*B*b^3*c^3 - 36*A*a*b^2*c^2
*d - 23*B*a*b^2*c^2*d + 36*A*a^2*b*c*d^2 + 13*B*a^2*b*c*d^2 - 12*A*a^3*d^3
+ 13*B*a^3*d^3)/(b^8*c^3*g^5*x^4 - 3*a*b^7*c^2*d*g^5*x^4 + 3*a^2*b^6*c*d^2*
g^5*x^4 - a^3*b^5*d^3*g^5*x^4 + 4*a*b^7*c^3*g^5*x^3 - 12*a^2*b^6*c^2*d*g^5*
x^3 + 12*a^3*b^5*c*d^2*g^5*x^3 - 4*a^4*b^4*d^3*g^5*x^3 + 6*a^2*b^6*c^3*g^5*
x^2 - 18*a^3*b^5*c^2*d*g^5*x^2 + 18*a^4*b^4*c*d^2*g^5*x^2 - 6*a^5*b^3*d^3*g
^5*x^2 + 4*a^3*b^5*c^3*g^5*x - 12*a^4*b^4*c^2*d*g^5*x + 12*a^5*b^3*c*d^2*g^
5*x - 4*a^6*b^2*d^3*g^5*x + a^4*b^4*c^3*g^5 - 3*a^5*b^3*c^2*d*g^5 + 3*a^6*b
^2*c*d^2*g^5 - a^7*b*d^3*g^5)
```

3.182 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\,dx$

Optimal. Leaf size=503

$$\frac{2B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{5bd^5}-\frac{2Bg^4(bc-ad)^5\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5bd^5}-\frac{2Bg^4(c+dx)(bc-ad)^4\left(\right.}{5d^5}$$

```
[Out] (13*B^2*(b*c - a*d)^4*g^4*x)/(30*d^4) - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^
2)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g^4*(a + b*x)^3)/(30*b*d^2) - (5*B^2*(b*
c - a*d)^5*g^4*Log[a + b*x])/(6*b*d^5) - (13*B^2*(b*c - a*d)^5*g^4*Log[(c +
 d*x)/(a + b*x)])/(30*b*d^5) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[
(e*(c + d*x))/(a + b*x)]))/(5*b*d^3) - (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(
A + B*Log[(e*(c + d*x))/(a + b*x)]))/(15*b*d^2) + (B*(b*c - a*d)*g^4*(a + b
*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(10*b*d) - (2*B*(b*c - a*d)^4*g
^4*(c + d*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(5*d^5) + (g^4*(a + b*x)
^5*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2)/(5*b) - (2*B*(b*c - a*d)^5*g^4*(
A + B*Log[(e*(c + d*x))/(a + b*x)])*Log[1 - (d*(a + b*x))/(b*(c + d*x))])/(
5*b*d^5) + (2*B^2*(b*c - a*d)^5*g^4*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))]
)/(5*b*d^5)
```

Rubi [A] time = 0.818276, antiderivative size = 557, normalized size of antiderivative = 1.11, number of steps used = 28, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}+\frac{2Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{5bd^5}+\frac{Bg^4(a+bx)^2(bc-ad)^3\left(B\log\right.}{5bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (13*B^2*(b*c - a*d)^4*g^4*x)/(30*d^4
) - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(60*b*d^3) + (B^2*(b*c - a*d)^2*g
^4*(a + b*x)^3)/(30*b*d^2) - (5*B^2*(b*c - a*d)^5*g^4*Log[c + d*x])/(6*b*d^
5) + (2*B^2*(b*c - a*d)^5*g^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x
])/(5*b*d^5) - (B^2*(b*c - a*d)^5*g^4*Log[c + d*x]^2)/(5*b*d^5) - (2*B^2*(b
*c - a*d)^4*g^4*(a + b*x)*Log[(e*(c + d*x))/(a + b*x)])/(5*b*d^4) + (B*(b*c
 - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(5*b*d^3) -
 (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(
```

```
15*b*d^2) + (B*(b*c - a*d)*g^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*
x)]))/(10*b*d) + (2*B*(b*c - a*d)^5*g^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x
))/(a + b*x)]))/(5*b*d^5) + (g^4*(a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a +
b*x)])^2)/(5*b) + (2*B^2*(b*c - a*d)^5*g^4*PolyLog[2, (b*(c + d*x))/(b*c -
a*d)])/(5*b*d^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b} - \frac{(2B)\int\frac{(bc-ad)g^5(a+bx)^4\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}\cdots}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int\frac{(a+bx)^4\left(-A-B\log\left(\frac{e(c+\cdots}{a+\cdots}\right.\right.}{c+dx}\cdots}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3\left(-A-B\log\cdots\right.}{d^4}\cdots\right.}{\cdots}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{5b} - \frac{\left(2B(bc-ad)g^4\right)\int(a+bx)^3\left(-A-B\cdots\right.}{5d}$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{5bd^3} - \frac{2B\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} - \frac{2B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{5bd^4} + \frac{B(bc-ad)\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} - \frac{2B^2(bc-ad)^5g^4\log(c+dx)}{5bd^5} - \frac{2B^2(bc-ad)^4g^4(a+\cdots}{5bd\cdots}$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \cdots$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \cdots$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \cdots$$

$$= -\frac{2AB(bc-ad)^4g^4x}{5d^4} + \frac{13B^2(bc-ad)^4g^4x}{30d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{60bd^3} + \cdots$$

Mathematica [A] time = 0.524062, size = 512, normalized size = 1.02

$$g^4\left((a+bx)^5\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2-\frac{B(bc-ad)\left(-12B(bc-ad)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-12d^2(a+bx)^2(bc-ad)^2(\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 - (B*(b*c - a*d)*(
24*A*b*d*(b*c - a*d)^3*x + 24*B*(b*c - a*d)^4*Log[a + b*x] - 4*B*(b*c - a*d
)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x])
- B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2 +
 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) - 12*B*(b*c - a*d)^3*(b*
d*x + (-(b*c) + a*d)*Log[c + d*x]) + 24*b*B*(b*c - a*d)^3*(c + d*x)*Log[(e*
(c + d*x))/(a + b*x)] - 12*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(c +
 d*x))/(a + b*x)]) + 8*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e*(c + d*x))
/(a + b*x)]) - 6*d^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 24*
(b*c - a*d)^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 12*B*(b*c
 - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x
] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(12*d^5)))/(5*b)
```

Maple [F] time = 2.313, size = 0, normalized size = 0.

$$\int\left(bgx+ag\right)^4\left(A+B\ln\left(\frac{e\,(dx+c)}{bx+a}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [B] time = 1.84687, size = 3233, normalized size = 6.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b +
 c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)
) + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*A*B*
a^3*b*g^4 + 2*(2*x^3*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x +
 a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 -
a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 1/3*(6*x^4*log(d*e*x/(b*x + a) + c
*e/(b*x + a)) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c
*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^
3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/30*(12*x^5*log(d*e*x/(b*x + a) + c*e/(b*
x + a)) - 12*a^5*log(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (3*(b^4*c*d^3
 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*
b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 + A^2*a^4*g^4
*x + 1/30*((12*g^4*log(e) - 25*g^4)*b^4*c^5 - (60*g^4*log(e) - 113*g^4)*a*b
^3*c^4*d + 4*(30*g^4*log(e) - 49*g^4)*a^2*b^2*c^3*d^2 - 12*(10*g^4*log(e) -
 13*g^4)*a^3*b*c^2*d^3 + 12*(5*g^4*log(e) - 4*g^4)*a^4*c*d^4)*B^2*log(d*x +
 c)/d^5 - 2/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 1
0*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x + a)*log(
(b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*
d^5) + 1/60*(12*B^2*b^5*d^5*g^4*x^5*log(e)^2 + 6*(b^5*c*d^4*g^4*log(e) + (1
0*g^4*log(e)^2 - g^4*log(e))*a*b^4*d^5)*B^2*x^4 - 2*((4*g^4*log(e) - g^4)*b
^5*c^2*d^3 - 2*(10*g^4*log(e) - g^4)*a*b^4*c*d^4 - (60*g^4*log(e)^2 - 16*g^
4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 + ((12*g^4*log(e) - 7*g^4)*b^5*c^3*d^2
 - 3*(20*g^4*log(e) - 9*g^4)*a*b^4*c^2*d^3 + 3*(40*g^4*log(e) - 11*g^4)*a^2
*b^3*c*d^4 + (120*g^4*log(e)^2 - 72*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^2*x
^2 - 2*((12*g^4*log(e) - 13*g^4)*b^5*c^4*d - (60*g^4*log(e) - 59*g^4)*a*b^4
*c^3*d^2 + 6*(20*g^4*log(e) - 17*g^4)*a^2*b^3*c^2*d^3 - (120*g^4*log(e) - 7
9*g^4)*a^3*b^2*c*d^4 - (30*g^4*log(e)^2 - 48*g^4*log(e) + 23*g^4)*a^4*b*d^5
)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*a^2*b^
3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x + B^2*a^
5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4 - 10*
a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 - 2*(12*B^2*b^
5*d^5*g^4*x^5*log(e) + 3*(b^5*c*d^4*g^4 + (20*g^4*log(e) - g^4)*a*b^4*d^5)*
B^2*x^4 - 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - 2*(15*g^4*log(e) - 2*g^4
)*a^2*b^3*d^5)*B^2*x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*
b^3*c*d^4*g^4 + 2*(10*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 12*(b^5*c^
4*d*g^4 - 5*a*b^4*c^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g
^4 - (5*g^4*log(e) - 4*g^4)*a^4*b*d^5)*B^2*x - (12*a*b^4*c^4*d*g^4 - 54*a^2
*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 - (12*g^4*lo
```

```
g(e) - 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) + 2*(12*B^2*b^5*d^5*g^4*x^5*log(e
) + 3*(b^5*c*d^4*g^4 + (20*g^4*log(e) - g^4)*a*b^4*d^5)*B^2*x^4 - 4*(b^5*c^
2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - 2*(15*g^4*log(e) - 2*g^4)*a^2*b^3*d^5)*B^2*
x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 + 2*(
10*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 12*(b^5*c^4*d*g^4 - 5*a*b^4*c
^3*d^2*g^4 + 10*a^2*b^3*c^2*d^3*g^4 - 10*a^3*b^2*c*d^4*g^4 - (5*g^4*log(e)
- 4*g^4)*a^4*b*d^5)*B^2*x - 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x
^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*
d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \left(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2a^2b^2g^4x^2 +\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((d*e*x + c*e)/(b
*x + a))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x
^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log((d*e*x + c*e)/(b*x + a)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^4 \left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^4*(B*log((d*x + c)*e/(b*x + a)) + A)^2, x)
```

3.183 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx$

Optimal. Leaf size=420

$$-\frac{B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{2bd^4}+\frac{Bg^3(bc-ad)^4\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bd^4}+\frac{Bg^3(c+dx)(bc-ad)^3\left(B\right.}{2d^4}$$

```
[Out] (-5*B^2*(b*c - a*d)^3*g^3*x)/(12*d^3) + (B^2*(b*c - a*d)^2*g^3*(a + b*x)^2)
/(12*b*d^2) + (11*B^2*(b*c - a*d)^4*g^3*Log[a + b*x])/(12*b*d^4) + (5*B^2*(
b*c - a*d)^4*g^3*Log[(c + d*x)/(a + b*x)])/(12*b*d^4) - (B*(b*c - a*d)^2*g^
3*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(4*b*d^2) + (B*(b*c - a
*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(6*b*d) + (B*(b*c
 - a*d)^3*g^3*(c + d*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*d^4) + (g^
3*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2)/(4*b) + (B*(b*c - a*d
)^4*g^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])*Log[1 - (d*(a + b*x))/(b*(c +
d*x))])/(2*b*d^4) - (B^2*(b*c - a*d)^4*g^3*PolyLog[2, (d*(a + b*x))/(b*(c +
 d*x))])/(2*b*d^4)
```

Rubi [A] time = 0.648144, antiderivative size = 474, normalized size of antiderivative = 1.13, number of steps used = 24, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bd^4}-\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bd^4}-\frac{Bg^3(a+bx)^2(bc-ad)^2\left(B\log\left(\right.\right.}{4bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (5*B^2*(b*c - a*d)^3*g^3*x)/(12*d^3) +
(B^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/(12*b*d^2) + (11*B^2*(b*c - a*d)^4*g^3*
Log[c + d*x])/(12*b*d^4) - (B^2*(b*c - a*d)^4*g^3*Log[-((d*(a + b*x))/(b*c
- a*d))]*Log[c + d*x])/(2*b*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[c + d*x]^2)/(
4*b*d^4) + (B^2*(b*c - a*d)^3*g^3*(a + b*x)*Log[(e*(c + d*x))/(a + b*x)])/(
2*b*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b
*x)]))/(4*b*d^2) + (B*(b*c - a*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/
(a + b*x)]))/(6*b*d) - (B*(b*c - a*d)^4*g^3*Log[c + d*x]*(A + B*Log[(e*(c +
 d*x))/(a + b*x)]))/(2*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x))/(
a + b*x)])^2)/(4*b) - (B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c + d*x))/(b*c
```

```
- a*d)])/(2*b*d^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{B\int \frac{(bc-ad)g^4(a+bx)^3\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}dx}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}}{2b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{d^3}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int(a+bx)^2\left(-A-B\log\right.}{2d}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4bd^2} + \frac{B(bc-}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} + \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{2bd^3} - \frac{B(bc-ad)^2g^3(}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} + \frac{B^2(bc-ad)^4g^3\log(c+dx)}{2bd^4} + \frac{B^2(bc-ad)^3g^3(a+bx)}{2bd^3}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} + \frac{11B^2(}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} + \frac{11B^2(}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} + \frac{11B^2(}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{2d^3} - \frac{5B^2(bc-ad)^3g^3x}{12d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{12bd^2} + \frac{11B^2(}{}$$

Mathematica [A] time = 0.35497, size = 392, normalized size = 0.93

$$g^3\left(\frac{B(bc-ad)\left(-3B(bc-ad)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2d^3(a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+3d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right.\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(b*c - a*d)*(
6*A*b*d*(b*c - a*d)^2*x + 6*B*(b*c - a*d)^3*Log[a + b*x] - B*(b*c - a*d)*(2
*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x]) - 3*B*
(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 6*b*B*(b*c - a*d)^2*(
c + d*x)*Log[(e*(c + d*x))/(a + b*x)] + 3*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A
 + B*Log[(e*(c + d*x))/(a + b*x)]) + 2*d^3*(a + b*x)^3*(A + B*Log[(e*(c + d
*x))/(a + b*x)]) - 6*(b*c - a*d)^3*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a
 + b*x)]) - 3*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c
 + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^4))
)/(4*b)
```

Maple [F] time = 1.958, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 \left(A + B\ln\left(\frac{e\,(dx + c)}{bx + a}\right)\right)^2 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [B] time = 1.68998, size = 2342, normalized size = 5.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a)/b + c*log(d*x + c)/d)*A*B
*a^3*g^3 + 3*(x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + a^2*log(b*x + a)/b
^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3 + (2*x^3*log
(d*e*x/(b*x + a) + c*e/(b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x
+ c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A
```

```
*B*a*b^2*g^3 + 1/12*(6*x^4*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + 6*a^4*log
(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*b^3*
g^3 + A^2*a^3*g^3*x - 1/12*((6*g^3*log(e) - 11*g^3)*b^3*c^4 - 2*(12*g^3*log
(e) - 19*g^3)*a*b^2*c^3*d + 9*(4*g^3*log(e) - 5*g^3)*a^2*b*c^2*d^2 - 6*(4*g
^3*log(e) - 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 1/2*(b^4*c^4*g^3 - 4*a
*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d^4*g^3)*(
log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c
 - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 2*(b^4*c*d^3
*g^3*log(e) + (6*g^3*log(e)^2 - g^3*log(e))*a*b^3*d^4)*B^2*x^3 - ((3*g^3*lo
g(e) - g^3)*b^4*c^2*d^2 - 2*(6*g^3*log(e) - g^3)*a*b^3*c*d^3 - (18*g^3*log(
e)^2 - 9*g^3*log(e) + g^3)*a^2*b^2*d^4)*B^2*x^2 + ((6*g^3*log(e) - 5*g^3)*b
^4*c^3*d - (24*g^3*log(e) - 17*g^3)*a*b^3*c^2*d^2 + (36*g^3*log(e) - 19*g^3
)*a^2*b^2*c*d^3 + (12*g^3*log(e)^2 - 18*g^3*log(e) + 7*g^3)*a^3*b*d^4)*B^2*
x + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a)^2 + 3*(B^2*b^
4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2
*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3
 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 - (6*B^2*b^4*d^4*g^3*x^4*log(e) +
 2*(b^4*c*d^3*g^3 + (12*g^3*log(e) - g^3)*a*b^3*d^4)*B^2*x^3 - 3*(b^4*c^2*d
^2*g^3 - 4*a*b^3*c*d^3*g^3 - 3*(4*g^3*log(e) - g^3)*a^2*b^2*d^4)*B^2*x^2 +
6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 + (4*g^3*log(e
) - 3*g^3)*a^3*b*d^4)*B^2*x + (6*a*b^3*c^3*d*g^3 - 21*a^2*b^2*c^2*d^2*g^3 +
 26*a^3*b*c*d^3*g^3 + (6*g^3*log(e) - 11*g^3)*a^4*d^4)*B^2)*log(b*x + a) +
(6*B^2*b^4*d^4*g^3*x^4*log(e) + 2*(b^4*c*d^3*g^3 + (12*g^3*log(e) - g^3)*a*
b^3*d^4)*B^2*x^3 - 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 - 3*(4*g^3*log(e)
 - g^3)*a^2*b^2*d^4)*B^2*x^2 + 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a
^2*b^2*c*d^3*g^3 + (4*g^3*log(e) - 3*g^3)*a^3*b*d^4)*B^2*x - 6*(B^2*b^4*d^4
*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*
b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c))/(b*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\frac{de}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
```

```
3*g^3)*log((d*e*x + c*e)/(b*x + a))^2 + 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^
3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*log((d*e*x + c*e)/(b*x + a)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx + ag)^3 \left(B \log \left(\frac{(dx + c)e}{bx + a}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((d*x + c)*e/(b*x + a)) + A)^2, x)
```

3.184 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx$

Optimal. Leaf size=335

$$\frac{2B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}-\frac{2Bg^2(bc-ad)^3\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bd^3}-\frac{2Bg^2(c+dx)(bc-ad)^2}{3d^3}$$

```
[Out] (B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) - (B^2*(b*c - a*d)^3*g^2*Log[a + b*x])/(b
*d^3) - (B^2*(b*c - a*d)^3*g^2*Log[(c + d*x)/(a + b*x)])/(3*b*d^3) + (B*(b*
c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*d) - (2
*B*(b*c - a*d)^2*g^2*(c + d*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*d^3
) + (g^2*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2)/(3*b) - (2*B*(
b*c - a*d)^3*g^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])*Log[1 - (d*(a + b*x))
/(b*(c + d*x))])/(3*b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*PolyLog[2, (d*(a + b*
x))/(b*(c + d*x))])/(3*b*d^3)
```

Rubi [A] time = 0.555908, antiderivative size = 389, normalized size of antiderivative = 1.16, number of steps used = 20, number of rules used = 13, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.406, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{2B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}+\frac{2Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bd^3}-\frac{2ABg^2x(bc-ad)^2}{3d^2}+\frac{Bg^2(a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) -
(B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (2*B^2*(b*c - a*d)^3*g^2*Log
[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (B^2*(b*c - a*d)^3
*g^2*Log[c + d*x]^2)/(3*b*d^3) - (2*B^2*(b*c - a*d)^2*g^2*(a + b*x)*Log[(e*
(c + d*x))/(a + b*x)])/(3*b*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Lo
g[(e*(c + d*x))/(a + b*x)]))/(3*b*d) + (2*B*(b*c - a*d)^3*g^2*Log[c + d*x]*
(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*d^3) + (g^2*(a + b*x)^3*(A + B*L
og[(e*(c + d*x))/(a + b*x)])^2)/(3*b) + (2*B^2*(b*c - a*d)^3*g^2*PolyLog[2,
 (b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{(2B)\int \frac{(bc-ad)g^3(a+bx)^2\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int \frac{(a+bx)^2\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)\left(-A-B\log\left(\frac{e}{}\right.\right.}{d^2}\right.}{}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3b} - \frac{\left(2B(bc-ad)g^2\right)\int(a+bx)\left(-A-B\log\right.}{3d}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3bd} + \frac{2B(bc}{}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} - \frac{2B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{3bd^2} + \frac{B(bc-ad)g^2}{}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} - \frac{2B^2(bc-ad)^3g^2\log(c+dx)}{3bd^3} - \frac{2B^2(bc-ad)^2g^2(a+}{3bd^2}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c+dx)}{bd^3} - \frac{2B^2}{}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c+dx)}{bd^3} + \frac{2B^2}{}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c+dx)}{bd^3} + \frac{2B^2}{}$$

$$= -\frac{2AB(bc-ad)^2g^2x}{3d^2} + \frac{B^2(bc-ad)^2g^2x}{3d^2} - \frac{B^2(bc-ad)^3g^2\log(c+dx)}{bd^3} + \frac{2B^2}{}$$

Mathematica [A] time = 0.238731, size = 290, normalized size = 0.87

$$\frac{g^2\left((a+bx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2 - \frac{B(bc-ad)\left(-B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-d^2(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right.\right.\right.}{}\right.}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 - (B*(b*c - a*d)*(
2*A*b*d*(b*c - a*d)*x + 2*B*(b*c - a*d)^2*Log[a + b*x] - B*(b*c - a*d)*(b*d
*x + (-(b*c) + a*d)*Log[c + d*x]) + 2*b*B*(b*c - a*d)*(c + d*x)*Log[(e*(c +
 d*x))/(a + b*x)] - d^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]) -
2*(b*c - a*d)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - B*(b*c
- a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(3*b)
```

Maple [F] time = 1.943, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^{2} \left(A + B \ln \left(\frac{e\left(dx + c\right)}{bx + a}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [B] time = 1.76125, size = 1582, normalized size = 4.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(d*e*x/(b*x + a) + c*e/(b*x
 + a)) - a*log(b*x + a)/b + c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log(d*e*
x/(b*x + a) + c*e/(b*x + a)) + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2
+ (b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 1/3*(2*x^3*log(d*e*x/(b*x + a) + c*e/(
b*x + a)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a
*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 + A^2*a^2*g^2
*x + 1/3*((2*g^2*log(e) - 3*g^2)*b^2*c^3 - (6*g^2*log(e) - 7*g^2)*a*b*c^2*d
 + 2*(3*g^2*log(e) - 2*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 2/3*(b^3*c^3*
g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x + a)*lo
```

```
g((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(
b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 + (b^3*c*d^2*g^2*log(e) + (3*g^2
*log(e)^2 - g^2*log(e))*a*b^2*d^3)*B^2*x^2 - ((2*g^2*log(e) - g^2)*b^3*c^2*
d - 2*(3*g^2*log(e) - g^2)*a*b^2*c*d^2 - (3*g^2*log(e)^2 - 4*g^2*log(e) + g
^2)*a^2*b*d^3)*B^2*x + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B
^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + (B^2*b^3*d^3*g^2*x^3
 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^3*c^3*g^2 - 3*a*b^2
*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 - (2*B^2*b^3*d^3*g^2*x^
3*log(e) + (b^3*c*d^2*g^2 + (6*g^2*log(e) - g^2)*a*b^2*d^3)*B^2*x^2 - 2*(b^
3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 - (3*g^2*log(e) - 2*g^2)*a^2*b*d^3)*B^2*x -
 (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 - (2*g^2*log(e) - 3*g^2)*a^3*d^3)*B
^2)*log(b*x + a) + (2*B^2*b^3*d^3*g^2*x^3*log(e) + (b^3*c*d^2*g^2 + (6*g^2*
log(e) - g^2)*a*b^2*d^3)*B^2*x^2 - 2*(b^3*c^2*d*g^2 - 3*a*b^2*c*d^2*g^2 - (
3*g^2*log(e) - 2*g^2)*a^2*b*d^3)*B^2*x - 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b
^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a))*log
(d*x + c))/(b*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{dex + ce}{bx + a}\right)^2 + 2\left(ABb^2g^2x^2 + 2\,ABab\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((d*e*x + c*e)/(b*x + a))^2 + 2*(A*B*b
^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^2)*log((d*e*x + c*e)/(b*x + a)), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)^2 \left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((d*x + c)*e/(b*x + a)) + A)^2, x)
```

3.185 $\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx$

Optimal. Leaf size=202

$$-\frac{B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}+\frac{Bg(bc-ad)^2\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bd^2}+\frac{Bg(c+dx)(bc-ad)\left(B\log\left(\right.\right.}{d^2}$$

```
[Out] (B^2*(b*c - a*d)^2*g*Log[a + b*x])/(b*d^2) + (B*(b*c - a*d)*g*(c + d*x)*(A
+ B*Log[(e*(c + d*x))/(a + b*x)]))/d^2 + (g*(a + b*x)^2*(A + B*Log[(e*(c +
d*x))/(a + b*x)])^2)/(2*b) + (B*(b*c - a*d)^2*g*(A + B*Log[(e*(c + d*x))/(a
 + b*x)])*Log[1 - (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) - (B^2*(b*c - a*d)^
2*g*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2)
```

Rubi [A] time = 0.417675, antiderivative size = 284, normalized size of antiderivative = 1.41, number of steps used = 16, number of rules used = 12, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}-\frac{Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (A*B*(b*c - a*d)*g*x)/d + (B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) - (B^2
*(b*c - a*d)^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d^2) +
(B^2*(b*c - a*d)^2*g*Log[c + d*x]^2)/(2*b*d^2) + (B^2*(b*c - a*d)*g*(a + b*
x)*Log[(e*(c + d*x))/(a + b*x)])/(b*d) - (B*(b*c - a*d)^2*g*Log[c + d*x]*(A
 + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*d^2) + (g*(a + b*x)^2*(A + B*Log[(e*
(c + d*x))/(a + b*x)])^2)/(2*b) - (B^2*(b*c - a*d)^2*g*PolyLog[2, (b*(c + d
*x))/(b*c - a*d)])/(b*d^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{B\int \frac{(bc-ad)g^2(a+bx)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}dx}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int \frac{(a+bx)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{c+dx}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{d} + \right.}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2b} - \frac{(B(bc-ad)g)\int \left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{d}$$

$$= \frac{AB(bc-ad)gx}{d} - \frac{B(bc-ad)^2 g\log(c+dx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bd^2} + \frac{g(a+b}{}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{bd} - \frac{B(bc-ad)^2 g\log(c}{}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2 g\log(c+dx)}{bd^2} + \frac{B^2(bc-ad)g(a+bx)\log\left(\right.}{bd}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2 g\log(c+dx)}{bd^2} + \frac{B^2(bc-ad)g(a+bx)\log\left(\right.}{bd}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2 g\log(c+dx)}{bd^2} - \frac{B^2(bc-ad)^2 g\log\left(-\frac{d(a+bx)}{bc-ad}\right.}{bd^2}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2 g\log(c+dx)}{bd^2} - \frac{B^2(bc-ad)^2 g\log\left(-\frac{d(a+bx)}{bc-ad}\right.}{bd^2}$$

$$= \frac{AB(bc-ad)gx}{d} + \frac{B^2(bc-ad)^2 g\log(c+dx)}{bd^2} - \frac{B^2(bc-ad)^2 g\log\left(-\frac{d(a+bx)}{bc-ad}\right.}{bd^2}$$

Mathematica [A] time = 0.185652, size = 203, normalized size = 1.

$$\frac{g\left(\frac{B(bc-ad)\left(-B(bc-ad)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)+2bB(c+dx)\log\left(\frac{e(c+dx)}{a+bx}\right)+2B(\right.}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(b*c - a*d)*(2*
A*b*d*x + 2*B*(b*c - a*d)*Log[a + b*x] + 2*b*B*(c + d*x)*Log[(e*(c + d*x))/
(a + b*x)] - 2*(b*c - a*d)*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]
) - B*(b*c - a*d)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log
[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^2))/(2*b)
```

Maple [F] time = 1.7, size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)\left(A + B\ln\left(\frac{e\,(dx + c)}{bx + a}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [B] time = 1.69013, size = 836, normalized size = 4.14

$$\frac{1}{2}A^2bgx^2 + 2\left(x\log\left(\frac{dex}{bx + a} + \frac{ce}{bx + a}\right) - \frac{a\log\left(bx + a\right)}{b} + \frac{c\log\left(dx + c\right)}{d}\right)ABag + \left(x^2\log\left(\frac{dex}{bx + a} + \frac{ce}{bx + a}\right) + \frac{a^2\log\left(bx\right.}{b^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - a*log(b*x + a
)/b + c*log(d*x + c)/d)*A*B*a*g + (x^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))
 + a^2*log(b*x + a)/b^2 - c^2*log(d*x + c)/d^2 + (b*c - a*d)*x/(b*d))*A*B*b
*g + A^2*a*g*x - ((g*log(e) - g)*b*c^2 - (2*g*log(e) - g)*a*c*d)*B^2*log(d*
x + c)/d^2 + (b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b*x + a)*log((b*d*x
 + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b*d^2) +
 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(b^2*c*d*g*log(e) + (g*log(e)^2 - g*lo
g(e))*a*b*d^2)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2
*g)*log(b*x + a)^2 + (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x - (b^2*c^2*g -
2*a*b*c*d*g)*B^2)*log(d*x + c)^2 - 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(
```

```
e) - g)*a*b*d^2 + b^2*c*d*g)*B^2*x + ((g*log(e) - g)*a^2*d^2 + a*b*c*d*g)*B
^2)*log(b*x + a) + 2*(B^2*b^2*d^2*g*x^2*log(e) + ((2*g*log(e) - g)*a*b*d^2
+ b^2*c*d*g)*B^2*x - (B^2*b^2*d^2*g*x^2 + 2*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g
)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{dex+ce}{bx+a}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{dex+ce}{bx+a}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d*e*x + c*e)/(b*x
 + a))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((d*e*x + c*e)/(b*x + a)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((d*x + c)*e/(b*x + a)) + A)^2, x)
```

3.186 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=128

$$-\frac{2B\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg}+\frac{2B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{bg}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2
)/(b*g)) - (2*B*(A + B*Log[(e*(c + d*x))/(a + b*x)])*PolyLog[2, (b*(c + d*x
))/(d*(a + b*x))])/(b*g) + (2*B^2*PolyLog[3, (b*(c + d*x))/(d*(a + b*x))])/
(b*g)
```

Rubi [B] time = 4.42328, antiderivative size = 719, normalized size of antiderivative = 5.62, number of steps used = 47, number of rules used = 24, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.75, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6691, 6741, 6742, 2499, 2302, 30, 2396, 2433, 2374, 6589, 2500, 2440, 2434, 2375, 2317}

$$-\frac{2AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{2B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(c+dx)}{a+bx}\right)+\log\left(\frac{1}{a+bx}\right)+\log(c+dx)\right)}{bg}-\frac{2B^2\text{PolyLog}\left(3,\right.}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x),x]
```

```
[Out] (A*B*Log[g*(a + b*x)]^2)/(b*g) + (B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (B^2*Lo
g[(a + b*x)^(-1)]^2*Log[c + d*x])/(b*g) - (2*B^2*Log[(a + b*x)^(-1)]*Log[g*
(a + b*x)]*Log[c + d*x])/(b*g) - (B^2*Log[g*(a + b*x)]^2*Log[c + d*x])/(b*g
) + (B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]^2)/(b*g) - (B^2*Log
[g*(a + b*x)]*Log[c + d*x]^2)/(b*g) + (B^2*Log[(a + b*x)^(-1)]^2*Log[(b*(c
+ d*x))/(b*c - a*d)])/(b*g) + (B^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*
c - a*d)])/(b*g) - (2*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x])/
(b*g) + (2*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*(Log[(a + b*x)^(-1)] + Log[c
+ d*x] - Log[(e*(c + d*x))/(a + b*x)])*Log[a*g + b*g*x])/(b*g) + ((A + B*Lo
g[(e*(c + d*x))/(a + b*x)])^2*Log[a*g + b*g*x])/(b*g) - (B^2*Log[(b*(c + d*
x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g) + (B^2*Log[(e*(c + d*x))/(a + b*
x)]*Log[a*g + b*g*x]^2)/(b*g) - (2*A*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*
d))])/(b*g) - (2*B^2*Log[(a + b*x)^(-1)]*PolyLog[2, -((d*(a + b*x))/(b*c -
a*d))])/(b*g) + (2*B^2*(Log[(a + b*x)^(-1)] + Log[c + d*x] - Log[(e*(c + d*
```

```
x))/(a + b*x)])*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (2*B^2*Lo
g[c + d*x]*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*g) - (2*B^2*PolyLog[3,
 -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (2*B^2*PolyLog[3, (b*(c + d*x))/(b*
c - a*d)])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6691

```
Int[(u_)^(m_.)*((a_.)*(u_)^(n_) + (v_))^(p_.)*(w_), x_Symbol] :> Int[u^(m +
 n*p)*(a + v/u^n)^p*w, x] /; FreeQ[{a, m, n}, x] && IntegerQ[p] &&  !GtQ[n,
 0] &&  !FreeQ[v, x]
```

Rule 6741

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
```

```
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx}{e(c+dx)}}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)\left(\frac{de}{a+bx}-\frac{be(c+dx)}{(a+bx)^2}\right)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx}{c+dx}}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{\left(de-\frac{be(c+dx)}{a+bx}\right)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{c+dx}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(bc-ad)e\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int \frac{\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{(bc-ad)(a+bx)} + \frac{d(}{}\right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{(2Bd)\int}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \left(\frac{A\log(ag+bgx)}{-a-bx} + \frac{B\log\left(\frac{e(c+dx)}{a+bx}\right)\log(ag+bgx)}{-a-bx}\right)dx}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2AB)\int \frac{\log(ag+bgx)}{-a-bx}\,dx}{g} - \frac{\left(2B^2\right)\int \frac{\log\left(\frac{e(c+dx)}{a+bx}\right)\log(ag}{-a-bx}}{g}$$

$$= -\frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2\log(ag+bgx)}{bg} + \frac{B^2\log\left(\frac{e(c+}{a+b}\right.}{}$$

$$= -\frac{2AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{2B^2\log\left(\frac{b(c+dx)}{bc-ad}\right)\left(\log\left(\frac{1}{a+bx}\right)+\log(c+dx)-\log\left(\frac{e(}{}\right.\right.}{bg}$$

$$= \frac{AB\log^2(g(a+bx))}{bg} - \frac{2B^2\log\left(\frac{1}{a+bx}\right)\log(g(a+bx))\log(c+dx)}{bg} - \frac{B^2\log(g(a+bx))\log^2}{bg}$$

$$= \frac{AB\log^2(g(a+bx))}{} - \frac{2B^2\log\left(\frac{1}{a+bx}\right)\log(g(a+bx))\log(c+dx)}{} + \frac{B^2\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log^2}{}$$

Mathematica [A] time = 0.276452, size = 251, normalized size = 1.96

$$2AB\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)-2B^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\log\left(\frac{e(c+dx)}{a+bx}\right)+2B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)+A^2\log(a+bx)+2AB\log$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x),x]
```

```
[Out] (-(A*B*Log[a/b + x]^2) + A^2*Log[a + b*x] + 2*A*B*Log[a/b + x]*Log[a + b*x]
 - 2*A*B*Log[c/d + x]*Log[a + b*x] + 2*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(
-(b*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(c + d*x))/(a + b*x)] - B^2*Log[
(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(c + d*x))/(a + b*x)]^2 + 2*A*B*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)] - 2*B^2*Log[(e*(c + d*x))/(a + b*x)]*PolyLo
g[2, (b*(c + d*x))/(d*(a + b*x))] + 2*B^2*PolyLog[3, (b*(c + d*x))/(d*(a +
b*x))])/(b*g)
```

Maple [B] time = 0.067, size = 906, normalized size = 7.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x)
```

```
[Out] -1/b/g/(a*d-b*c)*A^2*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*a*d+1/g/(a*d-b
*c)*A^2*ln(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)*c-1/b/g/(a*d-b*c)*B^2*ln(d*
e/b-e*(a*d-b*c)/b/(b*x+a))^2*ln(1-b/d/e*(d*e/b-e*(a*d-b*c)/b/(b*x+a)))*a*d+
1/g/(a*d-b*c)*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2*ln(1-b/d/e*(d*e/b-e*(a*
d-b*c)/b/(b*x+a)))*c-2/b/g/(a*d-b*c)*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*po
lylog(2,b/d/e*(d*e/b-e*(a*d-b*c)/b/(b*x+a)))*a*d+2/g/(a*d-b*c)*B^2*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))*polylog(2,b/d/e*(d*e/b-e*(a*d-b*c)/b/(b*x+a)))*c+2/
b/g/(a*d-b*c)*B^2*polylog(3,b/d/e*(d*e/b-e*(a*d-b*c)/b/(b*x+a)))*a*d-2/g/(a
*d-b*c)*B^2*polylog(3,b/d/e*(d*e/b-e*(a*d-b*c)/b/(b*x+a)))*c-2/b/g/(a*d-b*c
)*A*B*dilog(-(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)/d/e)*a*d+2/g/(a*d-b*c)*A
*B*dilog(-(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)/d/e)*c-2/b/g/(a*d-b*c)*A*B*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*ln(-(b*(d*e/b-e*(a*d-b*c)/b/(b*x+a))-d*e)/d
/e)*a*d+2/g/(a*d-b*c)*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*ln(-(b*(d*e/b-e*(
a*d-b*c)/b/(b*x+a))-d*e)/d/e)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{B^2 \log(bx+a)\log(dx+c)^2}{bg} + \frac{A^2 \log\left(bgx+ag\right)}{bg} - \int -\frac{B^2 bc \log(e)^2 + 2\,ABbc \log(e) + \left(B^2 bdx + B^2 bc\right)\log(bx+a)^2 +}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x, algorithm="maxima")
```

```
[Out] B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - integr
ate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + (B^2*b*d*x + B^2*b*c)*log(b*x +
 a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x - 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) + 2*(B^2*b*c*log(e) + A*B*b
*c + (B^2*b*d*log(e) + A*B*b*d)*x - (2*B^2*b*d*x + (b*c + a*d)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2 \log\left(\frac{dex+ce}{bx+a}\right)^2 + 2\,AB \log\left(\frac{dex+ce}{bx+a}\right) + A^2}{bgx+ag}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((d*e*x + c*e)/(b*x + a))^2 + 2*A*B*log((d*e*x + c*e)/(b*x
 + a)) + A^2)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g),x)
```

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)*e/(b*x + a)) + A)^2/(b*g*x + a*g), x)
```

3.187 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=153

$$-\frac{(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}+\frac{2AB(c+dx)}{g^2(a+bx)(bc-ad)}+\frac{2B^2(c+dx)\log\left(\frac{e(c+dx)}{a+bx}\right)}{g^2(a+bx)(bc-ad)}-\frac{2B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] (2*A*B*(c + d*x))/((b*c - a*d)*g^2*(a + b*x)) - (2*B^2*(c + d*x))/((b*c - a
*d)*g^2*(a + b*x)) + (2*B^2*(c + d*x)*Log[(e*(c + d*x))/(a + b*x)])/((b*c -
 a*d)*g^2*(a + b*x)) - ((c + d*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2)/(
(b*c - a*d)*g^2*(a + b*x))
```

Rubi [C] time = 0.762186, antiderivative size = 470, normalized size of antiderivative = 3.07, number of steps used = 26, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{2B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}+\frac{2Bd\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg^2(bc-ad)}-\frac{2Bd\log(c+dx)\left(B\dots\right.}{bg^2(bc\dots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-2*B^2)/(b*g^2*(a + b*x)) - (2*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) + (2*B^2*d*Log[c + d*x])/(b*(b*c
- a*d)*g^2) - (2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(
b*c - a*d)*g^2) + (B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (2*B^2*d*Log
[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) + (2*B*(A + B
*Log[(e*(c + d*x))/(a + b*x)]))/(b*g^2*(a + b*x)) + (2*B*d*Log[a + b*x]*(A
+ B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^2) - (2*B*d*Log[c + d*x
]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^2) - (A + B*Log[(e
*(c + d*x))/(a + b*x)])^2/(b*g^2*(a + b*x)) - (2*B^2*d*PolyLog[2, -((d*(a +
 b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (2*B^2*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)^2(a+bx)} + \frac{d^2\left(-A\right.}{(b}\right.}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(2Bd)\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{(bc-ad)g^2} + \frac{(2Bd^2}{}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^2} - \frac{2Bd\log(c+dx)\left(A+\right.}{b(bc-ad}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^2} - \frac{2Bd\log(c+dx)\left(A+\right.}{b(bc-ad}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^2} - \frac{2Bd\log(c+dx)\left(A+\right.}{b(bc-ad}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} + \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{bg^2(a+bx)} + \frac{2Bd\log}{}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{2B^2d\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{b(bc-ad)g^2} -$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{2B^2d\log\left(-\frac{d(}{b}\right.}{b(bc}$$

$$= -\frac{2B^2}{bg^2(a+bx)} - \frac{2B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{2B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{2B^2d\log\left(-\frac{d(}{b}\right.}{b(bc}$$

Mathematica [C] time = 0.494578, size = 314, normalized size = 2.05

$$-\frac{\frac{B\left(-Bd(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(a+bx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2(bc-a}{bc-}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(2*B*(b*c - a*d + d*(a + b*x
)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 2*(b*c - a*d)*(A + B*Log[(e*(c
 + d*x))/(a + b*x)]) - 2*d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(c + d*x))/
(a + b*x)]) + 2*d*(a + b*x)*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)
]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a + b*x)*((2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

Maple [B] time = 0.05, size = 1251, normalized size = 8.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x)
```

```
[Out] 1/b/(a*d-b*c)^2/g^2*A^2*d^2*a-1/(a*d-b*c)^2/g^2*A^2*d*c+2/(a*d-b*c)^2/g^2*A
*B*d*c-2/b/(a*d-b*c)^2/g^2*A*B*d^2*a+2/b/(a*d-b*c)^2/g^2*A*B/(b*x+a)*a^2*d^
2-1/b/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)*a^2*d^2
+2/b/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*a^2*d^2-2*
b/(a*d-b*c)^2/g^2*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*c^2+2/b/(a*d-
b*c)^2/g^2*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2*a+2/(a*d-b*c)^2/g^2*B^2*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)*a*d*c-4/(a*d-b*c)^2/g^2*A*B/(b*x+
a)*a*d*c-4/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*a*d*
c-1/b/(a*d-b*c)^2/g^2*A^2/(b*x+a)*a^2*d^2-b/(a*d-b*c)^2/g^2*A^2/(b*x+a)*c^2
-2*b/(a*d-b*c)^2/g^2*B^2/(b*x+a)*c^2-1/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-
b*c)/b/(b*x+a))^2*d*c+2/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))
*d*c+4/(a*d-b*c)^2/g^2*B^2/(b*x+a)*a*d*c+2*b/(a*d-b*c)^2/g^2*A*B/(b*x+a)*c^
2-2/b/(a*d-b*c)^2/g^2*B^2/(b*x+a)*a^2*d^2+2*b/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-
e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*c^2-2/(a*d-b*c)^2/g^2*A*B*ln(d*e/b-e*(a*d-b*
c)/b/(b*x+a))*d*c+1/b/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2
*d^2*a-b/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)*c^2-
2/b/(a*d-b*c)^2/g^2*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2*a+2/(a*d-b*c)^2
/g^2*A^2/(b*x+a)*a*d*c+2/b/(a*d-b*c)^2/g^2*B^2*d^2*a-2/(a*d-b*c)^2/g^2*B^2*
d*c+4/(a*d-b*c)^2/g^2*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*a*d*c-2/b
/(a*d-b*c)^2/g^2*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)*a^2*d^2
```

Maxima [B] time = 1.29471, size = 562, normalized size = 3.67

$$\left(2\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{(b^2c-abd)g^2}-\frac{d\log(dx+c)}{(b^2c-abd)g^2}\right)\log\left(\frac{dex}{bx+a}+\frac{ce}{bx+a}\right)+\frac{(bdx+ad)\log(bx+a)^2+(bdx+ad)\log(d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x, algorithm="maxima
")
```

```
[Out] (2*(1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(
d*x + c)/((b^2*c - a*b*d)*g^2))*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + ((b*
d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d -
2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a))
*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))*B
^2 - 2*A*B*(log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^2*g^2*x + a*b*g^2) - 1/
(b^2*g^2*x + a*b*g^2) - d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + d*log(d*x +
c)/((b^2*c - a*b*d)*g^2)) - B^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^2
*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.01157, size = 319, normalized size = 2.08

$$-\frac{(A^2-2\,AB+2\,B^2)bc-(A^2-2\,AB+2\,B^2)ad+(B^2bdx+B^2bc)\log\left(\frac{dex+ce}{bx+a}\right)^2+2\left((AB-B^2)bdx+(AB-B^2)bc\right)\log\left(\right.}{(b^3c-ab^2d)g^2x+(ab^2c-a^2bd)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x, algorithm="fricas
")
```

```
[Out] -((A^2 - 2*A*B + 2*B^2)*b*c - (A^2 - 2*A*B + 2*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((d*e*x + c*e)/(b*x + a))^2 + 2*((A*B - B^2)*b*d*x + (A*B - B^2)*b*
c)*log((d*e*x + c*e)/(b*x + a)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*
b*d)*g^2)
```

Sympy [B] time = 3.7579, size = 430, normalized size = 2.81

$$\frac{2Bd\left(A-B\right)\log\left(x+\frac{2ABad^2+2ABbcd-2B^2ad^2-2B^2bcd-\frac{2Ba^2d^3(A-B)}{ad-bc}+\frac{4Babcd^2(A-B)}{ad-bc}-\frac{2Bb^2c^2d(A-B)}{ad-bc}}{4ABbd^2-4B^2bd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{2Bd\left(A-B\right)\log\left(x+\frac{2ABad^2+2ABbcd}{}\right.}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**2,x)
```

```
[Out] 2*B*d*(A - B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d - 2*B**2*a*d**2 - 2*B**2*
b*c*d - 2*B*a**2*d**3*(A - B)/(a*d - b*c) + 4*B*a*b*c*d**2*(A - B)/(a*d - b
*c) - 2*B*b**2*c**2*d*(A - B)/(a*d - b*c))/(4*A*B*b*d**2 - 4*B**2*b*d**2))/
(b*g**2*(a*d - b*c)) - 2*B*d*(A - B)*log(x + (2*A*B*a*d**2 + 2*A*B*b*c*d -
2*B**2*a*d**2 - 2*B**2*b*c*d + 2*B*a**2*d**3*(A - B)/(a*d - b*c) - 4*B*a*b*
c*d**2*(A - B)/(a*d - b*c) + 2*B*b**2*c**2*d*(A - B)/(a*d - b*c))/(4*A*B*b*
d**2 - 4*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B + 2*B**2)*log(e*(c +
d*x)/(a + b*x))/(a*b*g**2 + b**2*g**2*x) + (B**2*c + B**2*d*x)*log(e*(c + d
*x)/(a + b*x))**2/(a**2*d*g**2 - a*b*c*g**2 + a*b*d*g**2*x - b**2*c*g**2*x)
 - (A**2 - 2*A*B + 2*B**2)/(a*b*g**2 + b**2*g**2*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2}{\left(bgx+ag\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)*e/(b*x + a)) + A)^2/(b*g*x + a*g)^2, x)
```

3.188 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=296

$$\frac{bB(c+dx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2g^3(a+bx)^2(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2}{g^3(a+bx)(bc-ad)^2}-\frac{2ABd(c+\cdots}{g^3(a+bx)(bc\cdots}$$

```
[Out] (-2*A*B*d*(c + d*x))/((b*c - a*d)^2*g^3*(a + b*x)) + (2*B^2*d*(c + d*x))/((
b*c - a*d)^2*g^3*(a + b*x)) - (b*B^2*(c + d*x)^2)/(4*(b*c - a*d)^2*g^3*(a +
 b*x)^2) - (2*B^2*d*(c + d*x)*Log[(e*(c + d*x))/(a + b*x)])/((b*c - a*d)^2*
g^3*(a + b*x)) + (b*B*(c + d*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*
(b*c - a*d)^2*g^3*(a + b*x)^2) + (d*(c + d*x)*(A + B*Log[(e*(c + d*x))/(a +
 b*x)])^2)/((b*c - a*d)^2*g^3*(a + b*x)) - (b*(c + d*x)^2*(A + B*Log[(e*(c
+ d*x))/(a + b*x)])^2)/(2*(b*c - a*d)^2*g^3*(a + b*x)^2)
```

Rubi [C] time = 0.910413, antiderivative size = 578, normalized size of antiderivative = 1.95, number of steps used = 30, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}-\frac{Bd^2\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)\left(B\log\cdots\right.}{bg^3(bc-\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -B^2/(4*b*g^3*(a + b*x)^2) + (3*B^2*d)/(2*b*(b*c - a*d)*g^3*(a + b*x)) + (3
*B^2*d^2*Log[a + b*x])/(2*b*(b*c - a*d)^2*g^3) - (B^2*d^2*Log[a + b*x]^2)/(
2*b*(b*c - a*d)^2*g^3) - (3*B^2*d^2*Log[c + d*x])/(2*b*(b*c - a*d)^2*g^3) +
 (B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*
g^3) - (B^2*d^2*Log[c + d*x]^2)/(2*b*(b*c - a*d)^2*g^3) + (B^2*d^2*Log[a +
b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) + (B*(A + B*Log[
(e*(c + d*x))/(a + b*x)]))/(2*b*g^3*(a + b*x)^2) - (B*d*(A + B*Log[(e*(c +
d*x))/(a + b*x)]))/(b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Log[a + b*x]*(A +
 B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*
x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(b*(b*c - a*d)^2*g^3) - (A + B*Log
[(e*(c + d*x))/(a + b*x)])^2/(2*b*g^3*(a + b*x)^2) + (B^2*d^2*PolyLog[2, -(
(d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3) + (B^2*d^2*PolyLog[2, (b
```

```
*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int\frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(B(bc-ad))\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)^2(a+bx)^2} + \frac{bd^2\left(-\cdots\right.}{(\cdots}\right.}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(Bd^2\right)\int\frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{(bc-ad)^2g^3} - \frac{\left(Bd^3\right)\cdots}{\cdots}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2bg^3(a+bx)^2} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{Bd^2\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right.\right.}{b(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2bg^3(a+bx)^2} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{Bd^2\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right.\right.}{b(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{2bg^3(a+bx)^2} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{Bd^2\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right.\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{3B^2d^2\log(c+dx)}{2b(bc-ad)^2g^3} + \frac{B\left(\cdots\right.}{\cdots}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{3B^2d^2\log(c+dx)}{2b(bc-ad)^2g^3} + \frac{B^2\cdots}{\cdots}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+bx)}{2b(bc-ad)^2g^3} - \frac{3B\cdots}{2\cdots}$$

$$= -\frac{B^2}{4bg^3(a+bx)^2} + \frac{3B^2d}{2b(bc-ad)g^3(a+bx)} + \frac{3B^2d^2\log(a+bx)}{2b(bc-ad)^2g^3} - \frac{B^2d^2\log^2(a+bx)}{2b(bc-ad)^2g^3} - \frac{3B\cdots}{2\cdots}$$

Mathematica [C] time = 0.476015, size = 444, normalized size = 1.5

$$\frac{B\left(-2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2Bd^2(a+bx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^3,x]
```

```
[Out] (-2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(4*B*d*(a + b*x)*(b*c - a*d
 + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*((b*c - a*d)^2
+ 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2*(a
+ b*x)^2*Log[c + d*x]) + 2*(b*c - a*d)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)
]) + 4*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 4*
d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) + 4*d^2*(
a + b*x)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]) - 2*B*d^2*(a +
 b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2
*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d^2*(a + b*x)^2*((2*Log[(d
*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(4*b*g^3*(a + b*x)^2)
```

Maple [B] time = 0.053, size = 1934, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x)
```

```
[Out] b/(a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d/(b*x+a)*c^2-3/2/b/(
a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3*a+3/2/(a*d-b*c)^3/g^
3*A*B*d^2*c+b/(a*d-b*c)^3/g^3*A*B*d/(b*x+a)*c^2+1/b/(a*d-b*c)^3/g^3*A*B*d^3
/(b*x+a)*a^2-3/4*b/(a*d-b*c)^3/g^3*B^2/(b*x+a)^2*c^2*a*d+1/2/b/(a*d-b*c)^3/
g^3*A*B/(b*x+a)^2*a^3*d^3-3/2*b/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*a*d*c^2+1/b/(
a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(b*x+a)*a^2-3/2/(a*d
-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*a^2*d^2*c+1/b/(a*
d-b*c)^3/g^3*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3*a-1/2/b/(a*d-b*c)^3/g^
3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^2*a^3*d^3-3/2/(a*d-b*c)^3/g
^3*A*B/(b*x+a)^2*a^2*d^2*c-2/(a*d-b*c)^3/g^3*A*B*d^2/(b*x+a)*a*c+b^2/(a*d-b
*c)^3/g^3*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*c^3+1/2/b/(a*d-b*c)
^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*a^3*d^3-3/2/b/(a*d-b*c
)^3/g^3*A*B*d^3*a+3/2/(a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2
/(b*x+a)^2*a^2*d^2*c-2/(a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*
d^2/(b*x+a)*a*c+1/2/b/(a*d-b*c)^3/g^3*A^2*d^3*a-1/2/(a*d-b*c)^3/g^3*A^2*d^2
*c-7/4/(a*d-b*c)^3/g^3*B^2*d^2*c-1/2/(a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*
c)/b/(b*x+a))^2*d^2*c+3/4/(a*d-b*c)^3/g^3*B^2/(b*x+a)^2*a^2*d^2*c+3/(a*d-b*
c)^3/g^3*B^2*d^2/(b*x+a)*c*a+1/2*b^2/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*c^3+1/4*
```

```
b^2/(a*d-b*c)^3/g^3*B^2/(b*x+a)^2*c^3+3/2/(a*d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a
*d-b*c)/b/(b*x+a))*d^2*c-1/4/b/(a*d-b*c)^3/g^3*B^2/(b*x+a)^2*a^3*d^3-3/2/b/
(a*d-b*c)^3/g^3*B^2*d^3/(b*x+a)*a^2-1/(a*d-b*c)^3/g^3*A*B*ln(d*e/b-e*(a*d-b
*c)/b/(b*x+a))*d^2*c+7/4/b/(a*d-b*c)^3/g^3*B^2*d^3*a-1/2*b^2/(a*d-b*c)^3/g^
3*A*B/(b*x+a)^2*c^3-1/2/b/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*a^3*d^3-1/2*b^2/(a*
d-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*c^3+1/2/b/(a*d-b
*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2*d^3*a+1/2*b^2/(a*d-b*c)^3/g
^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^2*c^3-3/2*b/(a*d-b*c)^3/g^
3*B^2*d/(b*x+a)*c^2+3/2/(a*d-b*c)^3/g^3*A^2/(b*x+a)^2*a^2*d^2*c-3*b/(a*d-b*
c)^3/g^3*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*c^2*a*d-1/b/(a*d-b*c
)^3/g^3*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*a^3*d^3-3/2*b/(a*d-b*
c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^2*c^2*a*d+3/2*b/(a*d
-b*c)^3/g^3*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^2*c^2*a*d+3/2*b/(a*
d-b*c)^3/g^3*A*B/(b*x+a)^2*c^2*a*d+3/(a*d-b*c)^3/g^3*A*B*ln(d*e/b-e*(a*d-b*
c)/b/(b*x+a))/(b*x+a)^2*a^2*d^2*c
```

Maxima [B] time = 1.54714, size = 1143, normalized size = 3.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x, algorithm="maxima
")
```

```
[Out] -1/4*(2*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c -
a^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^
2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*
c*d + a^2*b*d^2)*g^3))*log(d*e*x/(b*x + a) + c*e/(b*x + a)) + (b^2*c^2 - 8*
a*b*c*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^
2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a
*b*d^2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2
*d^2*x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2
)*log(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*
d^2*g^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*
c^2*g^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 - 1/2*A*B*((2*b*d*x
- b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x +
 (a^2*b^2*c - a^3*b*d)*g^3) + 2*log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^3*g
^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^
2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*
b*d^2)*g^3)) - 1/2*B^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^3*g^3*x^2
+ 2*a*b^2*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b
```

```
*g^3)
```

Fricas [A] time = 1.0752, size = 767, normalized size = 2.59

$$-\frac{\left(2\,A^2-2\,AB+B^2\right)b^2c^2-4\left(A^2-2\,AB+2\,B^2\right)abcd+\left(2\,A^2-6\,AB+7\,B^2\right)a^2d^2-2\left(B^2b^2d^2x^2+2\,B^2abd^2x-B^2b^2c^2+\right.}{4\left(\left(b^5c^2-2\,ab^4cd+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x, algorithm="fricas
")
```

```
[Out] -1/4*((2*A^2 - 2*A*B + B^2)*b^2*c^2 - 4*(A^2 - 2*A*B + 2*B^2)*a*b*c*d + (2*
A^2 - 6*A*B + 7*B^2)*a^2*d^2 - 2*(B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b
^2*c^2 + 2*B^2*a*b*c*d)*log((d*e*x + c*e)/(b*x + a))^2 + 2*((2*A*B - 3*B^2)
*b^2*c*d - (2*A*B - 3*B^2)*a*b*d^2)*x - 2*((2*A*B - 3*B^2)*b^2*d^2*x^2 - (2
*A*B - B^2)*b^2*c^2 + 4*(A*B - B^2)*a*b*c*d - 2*(B^2*b^2*c*d - 2*(A*B - B^2
)*a*b*d^2)*x)*log((d*e*x + c*e)/(b*x + a)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b
^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*
b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 6.71012, size = 892, normalized size = 3.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**3,x)
```

```
[Out] B*d**2*(2*A - 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 - 3*B**2*a*d**3 -
 3*B**2*b*c*d**2 - B*a**3*d**5*(2*A - 3*B)/(a*d - b*c)**2 + 3*B*a**2*b*c*d*
*4*(2*A - 3*B)/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3*(2*A - 3*B)/(a*d - b*c
)**2 + B*b**3*c**3*d**2*(2*A - 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 - 6*B**2*
b*d**3))/(2*b*g**3*(a*d - b*c)**2) - B*d**2*(2*A - 3*B)*log(x + (2*A*B*a*d*
*3 + 2*A*B*b*c*d**2 - 3*B**2*a*d**3 - 3*B**2*b*c*d**2 + B*a**3*d**5*(2*A -
3*B)/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4*(2*A - 3*B)/(a*d - b*c)**2 + 3*B*a*
b**2*c**2*d**3*(2*A - 3*B)/(a*d - b*c)**2 - B*b**3*c**3*d**2*(2*A - 3*B)/(a
*d - b*c)**2)/(4*A*B*b*d**3 - 6*B**2*b*d**3))/(2*b*g**3*(a*d - b*c)**2) + (
```

```
2*B**2*a*c*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(c +
 d*x)/(a + b*x))**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*g
**3*x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*g
**3*x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**3
*x**2) + (-2*A*B*a*d + 2*A*B*b*c + 3*B**2*a*d - B**2*b*c + 2*B**2*b*d*x)*lo
g(e*(c + d*x)/(a + b*x))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + 4*a**2*b**
2*d*g**3*x - 4*a*b**3*c*g**3*x + 2*a*b**3*d*g**3*x**2 - 2*b**4*c*g**3*x**2)
 + (-2*A**2*a*d + 2*A**2*b*c + 6*A*B*a*d - 2*A*B*b*c - 7*B**2*a*d + B**2*b*
c + x*(4*A*B*b*d - 6*B**2*b*d))/(4*a**3*b*d*g**3 - 4*a**2*b**2*c*g**3 + x**
2*(4*a*b**3*d*g**3 - 4*b**4*c*g**3) + x*(8*a**2*b**2*d*g**3 - 8*a*b**3*c*g*
*3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)*e/(b*x + a)) + A)^2/(b*g*x + a*g)^3, x)
```

3.189 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=399

$$\frac{2b^2B(c+dx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{2Bd^3\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{2Bd^2(c+dx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{g^4(a+bx)(bc-ad)^3}-\frac{bBd(}{}$$

```
[Out] (-2*B^2*d^2*(c + d*x))/((b*c - a*d)^3*g^4*(a + b*x)) + (b*B^2*d*(c + d*x)^2
)/(2*(b*c - a*d)^3*g^4*(a + b*x)^2) - (2*b^2*B^2*(c + d*x)^3)/(27*(b*c - a*
d)^3*g^4*(a + b*x)^3) + (B^2*d^3*Log[(c + d*x)/(a + b*x)]^2)/(3*b*(b*c - a*
d)^3*g^4) + (2*B*d^2*(c + d*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/((b*c
- a*d)^3*g^4*(a + b*x)) - (b*B*d*(c + d*x)^2*(A + B*Log[(e*(c + d*x))/(a +
b*x)]))/((b*c - a*d)^3*g^4*(a + b*x)^2) + (2*b^2*B*(c + d*x)^3*(A + B*Log[(
e*(c + d*x))/(a + b*x)]))/(9*(b*c - a*d)^3*g^4*(a + b*x)^3) - (2*B*d^3*Log[
(c + d*x)/(a + b*x)]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*(b*c - a*d)
^3*g^4) - (A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(3*b*g^4*(a + b*x)^3)
```

Rubi [C] time = 1.07406, antiderivative size = 680, normalized size of antiderivative = 1.7, number of steps used = 34, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{2B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}+\frac{2Bd^3\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(c+dx)}{3bg^4(}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-2*B^2)/(27*b*g^4*(a + b*x)^3) + (5*B^2*d)/(18*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (11*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (11*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)^3
*g^4) + (11*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*Log[
-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (B^2*
d^3*Log[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (2*B^2*d^3*Log[a + b*x]*Log[(
b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) + (2*B*(A + B*Log[(e*(c
+ d*x))/(a + b*x)]))/(9*b*g^4*(a + b*x)^3) - (B*d*(A + B*Log[(e*(c + d*x))/
(a + b*x)]))/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (2*B*d^2*(A + B*Log[(e*(c
+ d*x))/(a + b*x)]))/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (2*B*d^3*Log[a + b
```

```
*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*(b*c - a*d)^3*g^4) - (2*B*d^
3*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(3*b*(b*c - a*d)^3*g^4
) - (A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(3*b*g^4*(a + b*x)^3) - (2*B^2*d
^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b*(b*c - a*d)^3*g^4) - (2*B
^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
```

```
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^4} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)^2(a+bx)^3} + \frac{bd^2(}{}\right.}{3b}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^4}\,dx}{3g^4} - \frac{\left(2Bd^3\right)\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{3(bc-ad)^3g^4} + \frac{(2}{}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{9bg^4(a+bx)^3} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{2Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} + \frac{2Ba}{}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{9bg^4(a+bx)^3} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{2Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} + \frac{2Ba}{}$$

$$= \frac{2B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{9bg^4(a+bx)^3} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{2Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} + \frac{2Ba}{}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+}{9b(bc-ad)^3g}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+}{9b(bc-ad)^3g}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+}{9b(bc-ad)^3g}$$

$$= -\frac{2B^2}{27bg^4(a+bx)^3} + \frac{5B^2d}{18b(bc-ad)g^4(a+bx)^2} - \frac{11B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{11B^2d^3\log(a+}{9b(bc-ad)^3g}$$

Mathematica [C] time = 0.790161, size = 585, normalized size = 1.47

$$-\frac{B\left(-18Bd^3(a+bx)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18Bd^3(a+bx)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -(18*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(36*B*d^2*(a + b*x)^2*(b*c
 - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*(a +
b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[
a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*d*(b*
c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)^3*Lo
g[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 12*(b*c - a*d)^3*(A + B*Log[
(e*(c + d*x))/(a + b*x)]) + 18*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[(e*(c +
 d*x))/(a + b*x)]) + 36*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Log[(e*(c + d
*x))/(a + b*x)]) - 36*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Log[(e*(c + d*x))
/(a + b*x)]) + 36*d^3*(a + b*x)^3*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a
+ b*x)]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 18*B*d
^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c
+ d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^3)/(54*b*g^
4*(a + b*x)^3)
```

Maple [B] time = 0.055, size = 2758, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3/(a*d-b*c)^4/g^4*A^2*d^3*c+8/3/(a*d-b*c)^4/g^4*A*B*ln(d*e/b-e*(a*d-b*c)
/b/(b*x+a))/(b*x+a)^3*a^3*d^3*c-2*b/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e*(a*d-b*c
)/b/(b*x+a))^2/(b*x+a)^3*a^2*d^2*c^2-2/3/b/(a*d-b*c)^4/g^4*A*B*ln(d*e/b-e*(
a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^4*d^4+4/3*b^2/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-
e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^3*c^3*a*d+b/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e
*(a*d-b*c)/b/(b*x+a))*d^2/(b*x+a)^2*a*c^2+4/3*b/(a*d-b*c)^4/g^4*B^2*ln(d*e/
b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^2*d^2*c^2-8/9*b^2/(a*d-b*c)^4/g^4*B^2*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a*d*c^3+8/3*b^2/(a*d-b*c)^4/g^4*A
*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*c^3*a*d-4*b/(a*d-b*c)^4/g^4*A*
B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^2*d^2*c^2-8/9*b^2/(a*d-b*c)^4
/g^4*A*B/(b*x+a)^3*a*d*c^3+4/3*b/(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a^2*d^2*c^2+
b/(a*d-b*c)^4/g^4*A*B*d^2/(b*x+a)^2*a*c^2-4/3/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-
e*(a*d-b*c)/b/(b*x+a))*d^3/(b*x+a)*a*c+1/3/b/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e
*(a*d-b*c)/b/(b*x+a))*d^4/(b*x+a)^2*a^3-1/3*b^2/(a*d-b*c)^4/g^4*B^2*ln(d*e/
```

```
b-e*(a*d-b*c)/b/(b*x+a))*d/(b*x+a)^2*c^3-1/3/b/(a*d-b*c)^4/g^4*B^2*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^3*a^4*d^4+2/9/b/(a*d-b*c)^4/g^4*B^2*ln(d*
e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^4*d^4+85/54/b/(a*d-b*c)^4/g^4*B^2*d^
4*a+8/27/(a*d-b*c)^4/g^4*B^2/(b*x+a)^3*a^3*d^3*c+1/3/b/(a*d-b*c)^4/g^4*B^2*
ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2*d^4*a-11/9/b/(a*d-b*c)^4/g^4*B^2*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))*d^4*a+2/9*b^3/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e*(a*d-b
*c)/b/(b*x+a))/(b*x+a)^3*c^4-1/3*b^3/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e*(a*d-b*
c)/b/(b*x+a))^2/(b*x+a)^3*c^4-1/3*b^3/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*c^4-2/2
7*b^3/(a*d-b*c)^4/g^4*B^2/(b*x+a)^3*c^4-1/3/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e*
(a*d-b*c)/b/(b*x+a))^2*d^3*c-2/3/(a*d-b*c)^4/g^4*A*B*ln(d*e/b-e*(a*d-b*c)/b
/(b*x+a))*d^3*c+5/6/(a*d-b*c)^4/g^4*B^2*d^3/(b*x+a)^2*a^2*c+4/3/(a*d-b*c)^4
/g^4*A^2/(b*x+a)^3*a^3*d^3*c+22/9/(a*d-b*c)^4/g^4*B^2*d^3/(b*x+a)*a*c+2/9/b
/(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a^4*d^4-1/3*b^2/(a*d-b*c)^4/g^4*A*B*d/(b*x+a
)^2*c^3+1/3/b/(a*d-b*c)^4/g^4*A*B*d^4/(b*x+a)^2*a^3+4/3*b^2/(a*d-b*c)^4/g^4
*A^2/(b*x+a)^3*a*d*c^3-5/6*b/(a*d-b*c)^4/g^4*B^2*d^2/(b*x+a)^2*c^2*a+2/3*b/
(a*d-b*c)^4/g^4*A*B*d^2/(b*x+a)*c^2+2/3/b/(a*d-b*c)^4/g^4*A*B*d^4/(b*x+a)*a
^2+11/9/(a*d-b*c)^4/g^4*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3*c-11/9/b/(a
*d-b*c)^4/g^4*A*B*d^4*a+11/9/(a*d-b*c)^4/g^4*A*B*d^3*c-2/27/b/(a*d-b*c)^4/g
^4*B^2/(b*x+a)^3*a^4*d^4-11/9/b/(a*d-b*c)^4/g^4*B^2*d^4/(b*x+a)*a^2-11/9*b/
(a*d-b*c)^4/g^4*B^2*d^2/(b*x+a)*c^2-1/3/b/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*a^4
*d^4+8/27*b^2/(a*d-b*c)^4/g^4*B^2/(b*x+a)^3*c^3*a*d-4/9*b/(a*d-b*c)^4/g^4*B
^2/(b*x+a)^3*a^2*d^2*c^2-2*b/(a*d-b*c)^4/g^4*A^2/(b*x+a)^3*a^2*d^2*c^2-8/9/
(a*d-b*c)^4/g^4*A*B/(b*x+a)^3*a^3*d^3*c-4/3/(a*d-b*c)^4/g^4*A*B*d^3/(b*x+a)
*a*c-1/(a*d-b*c)^4/g^4*A*B*d^3/(b*x+a)^2*a^2*c+2/3/b/(a*d-b*c)^4/g^4*B^2*ln
(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4/(b*x+a)*a^2+2/3*b/(a*d-b*c)^4/g^4*B^2*ln(
d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^2/(b*x+a)*c^2-1/(a*d-b*c)^4/g^4*B^2*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))*d^3/(b*x+a)^2*a^2*c-8/9/(a*d-b*c)^4/g^4*B^2*ln(d*e/
b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^3*a^3*d^3*c+4/3/(a*d-b*c)^4/g^4*B^2*ln(d*e
/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^3*a^3*d^3*c+2/9*b^3/(a*d-b*c)^4/g^4*A*B
/(b*x+a)^3*c^4-5/18/b/(a*d-b*c)^4/g^4*B^2*d^4/(b*x+a)^2*a^3+5/18*b^2/(a*d-b
*c)^4/g^4*B^2*d/(b*x+a)^2*c^3-85/54/(a*d-b*c)^4/g^4*B^2*d^3*c+1/3/b/(a*d-b*
c)^4/g^4*A^2*d^4*a+2/3/b/(a*d-b*c)^4/g^4*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a)
)*d^4*a-2/3*b^3/(a*d-b*c)^4/g^4*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)
^3*c^4
```

Maxima [B] time = 1.78074, size = 1917, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x, algorithm="maxima
")
```

```
[Out] 1/54*(6*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^
3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4
) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*
d^3)*g^4))*log(d*e*x/(b*x + a) + c*e/(b*x + a)) - (4*b^3*c^3 - 27*a*b^2*c^2
*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b^
3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18*
(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 -
3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*b
^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 33
*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^3
*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g^
4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g^
4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*b
^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*x
^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*b
^2*d^3*g^4)*x))*B^2 + 1/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*
a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)
*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4
*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
a^5*b*d^2)*g^4) - 6*log(d*e*x/(b*x + a) + c*e/(b*x + a))/(b^4*g^4*x^3 + 3*a
*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3
- 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((
b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*log(
d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*
g^4*x + a^3*b*g^4)
```

Fricas [A] time = 1.30216, size = 1388, normalized size = 3.48

$$-\frac{2\left(9A^2-6AB+2B^2\right)b^3c^3-27\left(2A^2-2AB+B^2\right)ab^2c^2d+54\left(A^2-2AB+2B^2\right)a^2bcd^2-\left(18A^2-66AB+85B^2\right)a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x, algorithm="fricas
")
```

```
[Out] -1/54*(2*(9*A^2 - 6*A*B + 2*B^2)*b^3*c^3 - 27*(2*A^2 - 2*A*B + B^2)*a*b^2*c
^2*d + 54*(A^2 - 2*A*B + 2*B^2)*a^2*b*c*d^2 - (18*A^2 - 66*A*B + 85*B^2)*a^
3*d^3 - 6*((6*A*B - 11*B^2)*b^3*c*d^2 - (6*A*B - 11*B^2)*a*b^2*d^3)*x^2 + 1
8*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3
- 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((d*e*x + c*e)/(b*x + a))^2 + 3
*((6*A*B - 5*B^2)*b^3*c^2*d - 18*(2*A*B - 3*B^2)*a*b^2*c*d^2 + (30*A*B - 49
*B^2)*a^2*b*d^3)*x + 6*((6*A*B - 11*B^2)*b^3*d^3*x^3 + 2*(3*A*B - B^2)*b^3*
c^3 - 9*(2*A*B - B^2)*a*b^2*c^2*d + 18*(A*B - B^2)*a^2*b*c*d^2 - 3*(2*B^2*b
^3*c*d^2 - 3*(2*A*B - 3*B^2)*a*b^2*d^3)*x^2 + 3*(B^2*b^3*c^2*d - 6*B^2*a*b^
2*c*d^2 + 6*(A*B - B^2)*a^2*b*d^3)*x)*log((d*e*x + c*e)/(b*x + a)))/((b^7*c
^3 - 3*a*b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3
- 3*a^2*b^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3
 - 3*a^3*b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 -
3*a^4*b^3*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

Sympy [B] time = 34.789, size = 1544, normalized size = 3.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**4,x)
```

```
[Out] B*d**3*(6*A - 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B*b*c*d**3 - 11*B**2*a*d**4
 - 11*B**2*b*c*d**3 - B*a**4*d**7*(6*A - 11*B)/(a*d - b*c)**3 + 4*B*a**3*b*
c*d**6*(6*A - 11*B)/(a*d - b*c)**3 - 6*B*a**2*b**2*c**2*d**5*(6*A - 11*B)/(
a*d - b*c)**3 + 4*B*a*b**3*c**3*d**4*(6*A - 11*B)/(a*d - b*c)**3 - B*b**4*c
**4*d**3*(6*A - 11*B)/(a*d - b*c)**3)/(12*A*B*b*d**4 - 22*B**2*b*d**4))/(9*
b*g**4*(a*d - b*c)**3) - B*d**3*(6*A - 11*B)*log(x + (6*A*B*a*d**4 + 6*A*B*
b*c*d**3 - 11*B**2*a*d**4 - 11*B**2*b*c*d**3 + B*a**4*d**7*(6*A - 11*B)/(a*
d - b*c)**3 - 4*B*a**3*b*c*d**6*(6*A - 11*B)/(a*d - b*c)**3 + 6*B*a**2*b**2
*c**2*d**5*(6*A - 11*B)/(a*d - b*c)**3 - 4*B*a*b**3*c**3*d**4*(6*A - 11*B)/
(a*d - b*c)**3 + B*b**4*c**4*d**3*(6*A - 11*B)/(a*d - b*c)**3)/(12*A*B*b*d*
*4 - 22*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3*B**2*a**2*c*d**2 + 3*B
**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**3*x**2 + B**2*b**2*c**3
 + B**2*b**2*d**3*x**3)*log(e*(c + d*x)/(a + b*x))**2/(3*a**6*d**3*g**4 - 9
*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9*a**4*b**2*c**2*d*g**4 - 27*a
**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4*x**2 - 3*a**3*b**3*c**3*g**4
 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c*d**2*g**4*x**2 + 3*a**3*b**3
*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27*a**2*b**4*c**2*d*g**4*x**2 -
 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*g**4*x**2 + 9*a*b**5*c**2*d*g
**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a**2*d**2 + 12*A*B*a*b*c*d - 6*
```

```
A*B*b**2*c**2 + 11*B**2*a**2*d**2 - 7*B**2*a*b*c*d + 15*B**2*a*b*d**2*x + 2
*B**2*b**2*c**2 - 3*B**2*b**2*c*d*x + 6*B**2*b**2*d**2*x**2)*log(e*(c + d*x
)/(a + b*x))/(9*a**5*b*d**2*g**4 - 18*a**4*b**2*c*d*g**4 + 27*a**4*b**2*d**
2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*a**3*b**3*c*d*g**4*x + 27*a**3*b**3*d
**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4*x - 54*a**2*b**4*c*d*g**4*x**2 + 9*a
**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c**2*g**4*x**2 - 18*a*b**5*c*d*g**4*x**
3 + 9*b**6*c**2*g**4*x**3) + (-18*A**2*a**2*d**2 + 36*A**2*a*b*c*d - 18*A**
2*b**2*c**2 + 66*A*B*a**2*d**2 - 42*A*B*a*b*c*d + 12*A*B*b**2*c**2 - 85*B**
2*a**2*d**2 + 23*B**2*a*b*c*d - 4*B**2*b**2*c**2 + x**2*(36*A*B*b**2*d**2 -
 66*B**2*b**2*d**2) + x*(90*A*B*a*b*d**2 - 18*A*B*b**2*c*d - 147*B**2*a*b*d
**2 + 15*B**2*b**2*c*d))/(54*a**5*b*d**2*g**4 - 108*a**4*b**2*c*d*g**4 + 54
*a**3*b**3*c**2*g**4 + x**3*(54*a**2*b**4*d**2*g**4 - 108*a*b**5*c*d*g**4 +
 54*b**6*c**2*g**4) + x**2*(162*a**3*b**3*d**2*g**4 - 324*a**2*b**4*c*d*g**
4 + 162*a*b**5*c**2*g**4) + x*(162*a**4*b**2*d**2*g**4 - 324*a**3*b**3*c*d*
g**4 + 162*a**2*b**4*c**2*g**4))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2}{\left(bgx+ag\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^4,x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)*e/(b*x + a)) + A)^2/(b*g*x + a*g)^4, x)
```

3.190 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=498

$$-\frac{2b^2Bd(c+dx)^3\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^4}+\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{8g^5(a+bx)^4(bc-ad)^4}+\frac{Bd^4\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bg^5(bc-ad)^4}-$$

```
[Out] (2*B^2*d^3*(c + d*x))/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*B^2*d^2*(c + d*x
)^2)/(4*(b*c - a*d)^4*g^5*(a + b*x)^2) + (2*b^2*B^2*d*(c + d*x)^3)/(9*(b*c
- a*d)^4*g^5*(a + b*x)^3) - (b^3*B^2*(c + d*x)^4)/(32*(b*c - a*d)^4*g^5*(a
+ b*x)^4) - (B^2*d^4*Log[(c + d*x)/(a + b*x)]^2)/(4*b*(b*c - a*d)^4*g^5) -
(2*B*d^3*(c + d*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/((b*c - a*d)^4*g^5
*(a + b*x)) + (3*b*B*d^2*(c + d*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/
(2*(b*c - a*d)^4*g^5*(a + b*x)^2) - (2*b^2*B*d*(c + d*x)^3*(A + B*Log[(e*(c
 + d*x))/(a + b*x)]))/(3*(b*c - a*d)^4*g^5*(a + b*x)^3) + (b^3*B*(c + d*x)^
4*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(8*(b*c - a*d)^4*g^5*(a + b*x)^4) +
 (B*d^4*Log[(c + d*x)/(a + b*x)]*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*b
*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(4*b*g^5*(a +
b*x)^4)
```

Rubi [C] time = 1.26372, antiderivative size = 763, normalized size of antiderivative = 1.53, number of steps used = 38, number of rules used = 11, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.344, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}+\frac{B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{2bg^5(bc-ad)^4}-\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)\left(B\log\right.}{2bg^5(bc-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(32*b*g^5*(a + b*x)^4) + (7*B^2*d)/(72*b*(b*c - a*d)*g^5*(a + b*x)^3)
- (13*B^2*d^2)/(48*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(24*b*(b
*c - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(24*b*(b*c - a*d)^4*
g^5) - (B^2*d^4*Log[a + b*x]^2)/(4*b*(b*c - a*d)^4*g^5) - (25*B^2*d^4*Log[c
 + d*x])/(24*b*(b*c - a*d)^4*g^5) + (B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(2*b*(b*c - a*d)^4*g^5) - (B^2*d^4*Log[c + d*x]^2)/(4*b*(
b*c - a*d)^4*g^5) + (B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(
```

```
2*b*(b*c - a*d)^4*g^5) + (B*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(8*b*g^5*
(a + b*x)^4) - (B*d*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(6*b*(b*c - a*d)*
g^5*(a + b*x)^3) + (B*d^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(4*b*(b*c -
 a*d)^2*g^5*(a + b*x)^2) - (B*d^3*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/(2*
b*(b*c - a*d)^3*g^5*(a + b*x)) - (B*d^4*Log[a + b*x]*(A + B*Log[(e*(c + d*x
))/(a + b*x)]))/(2*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x]*(A + B*Log[(e
*(c + d*x))/(a + b*x)]))/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x))
/(a + b*x)])^2/(4*b*g^5*(a + b*x)^4) + (B^2*d^4*PolyLog[2, -((d*(a + b*x))/
(b*c - a*d))])/(2*b*(b*c - a*d)^4*g^5) + (B^2*d^4*PolyLog[2, (b*(c + d*x))/
(b*c - a*d)])/(2*b*(b*c - a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^5(c+dx)}\,dx}{2bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)(a+bx)^5} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{(bc-ad)^2(a+bx)^4} + \frac{bd^2\left(-A\right.}{(bc-}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{(a+bx)^5}\,dx}{2g^5} + \frac{\left(Bd^4\right)\int \frac{-A-B\log\left(\frac{e(c+dx)}{a+bx}\right)}{a+bx}\,dx}{2(bc-ad)^4g^5} - \frac{\left(Bd^5\right)\int}{2b}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{8bg^5(a+bx)^4} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2} - \frac{Bd^3\left(A\right.}{2b(bc-}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{8bg^5(a+bx)^4} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2} - \frac{Bd^3\left(A\right.}{2b(bc-}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{8bg^5(a+bx)^4} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{6b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{4b(bc-ad)^2g^5(a+bx)^2} - \frac{Bd^3\left(A\right.}{2b(bc-}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d}{24b(bc-ad)^3g}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d}{24b(bc-ad)^3g}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d}{24b(bc-ad)^3g}$$

$$= -\frac{B^2}{32bg^5(a+bx)^4} + \frac{7B^2d}{72b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{48b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d}{24b(bc-ad)^3g}$$

Mathematica [C] time = 1.06083, size = 748, normalized size = 1.5

$$\frac{B\left(-72Bd^4(a+bx)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+72Bd^4(a+bx)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x))/(a + b*x)])^2/(a*g + b*g*x)^5,x]
```

```
[Out] (-72*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2 + (B*(144*B*d^3*(a + b*x)^3*(b*
c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 36*B*d^2*(
a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^
2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 8*B*d*(a + b*x)*(2*(b*c
- a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*
d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 3*B*(3*(b*
c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a + b*x)
^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x] +
12*d^4*(a + b*x)^4*Log[c + d*x]) + 36*(b*c - a*d)^4*(A + B*Log[(e*(c + d*x)
)/(a + b*x)]) + 48*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(c + d*x))/(a
 + b*x)]) + 72*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a +
b*x)]) + 144*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(c + d*x))/(a + b
*x)]) - 144*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)
]) + 144*d^4*(a + b*x)^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x))/(a + b*x)])
- 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b
*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 72*B*d^4*(a + b
*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^4)/(288*b*g^5*(a + b
*x)^4)
```

Maple [B] time = 0.054, size = 3717, normalized size = 7.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x)
```

```
[Out] -5/4*b^2/(a*d-b*c)^5/g^5*A*B/(b*x+a)^4*a^2*d^2*c^3+5/8*b^3/(a*d-b*c)^5/g^5*
A*B/(b*x+a)^4*a*d*c^4+5/4*b/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x
+a))/(b*x+a)^4*a^3*d^3*c^2-5/4*b^2/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)
/b/(b*x+a))/(b*x+a)^4*a^2*d^2*c^3+5/8*b^3/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a
*d-b*c)/b/(b*x+a))/(b*x+a)^4*a*d*c^4+b/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-
b*c)/b/(b*x+a))*d^3/(b*x+a)^3*a^2*c^2-1/2/b/(a*d-b*c)^5/g^5*A*B*ln(d*e/b-e*
(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^5*d^5-2/3*b^2/(a*d-b*c)^5/g^5*B^2*ln(d*e/b
-e*(a*d-b*c)/b/(b*x+a))*d^2/(b*x+a)^3*c^3*a-5/2*b/(a*d-b*c)^5/g^5*B^2*ln(d*
e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^4*a^3*d^3*c^2+5/2*b^2/(a*d-b*c)^5/g^5*
B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^4*a^2*d^2*c^3+3/4*b/(a*d-b*c)
```

^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(b*x+a)^2*c^2*a-5/4*b^3/(a*d
-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^4*c^4*a*d+5/2/(a*
d-b*c)^5/g^5*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^4*d^4*c-5*b/(a
*d-b*c)^5/g^5*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^3*d^3*c^2+5*b
^2/(a*d-b*c)^5/g^5*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^2*d^2*c^
3-5/2*b^3/(a*d-b*c)^5/g^5*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a*d
*c^4+5/2*b^2/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a^2*d^2*c^3-5/2*b/(a*d-b*c)^5/g^
5*A^2/(b*x+a)^4*a^3*d^3*c^2+1/6*b^3/(a*d-b*c)^5/g^5*A*B*d/(b*x+a)^3*c^4+1/4
/b/(a*d-b*c)^5/g^5*A*B*d^5/(b*x+a)^2*a^3-1/4*b^2/(a*d-b*c)^5/g^5*A*B*d^2/(b
*x+a)^2*c^3+1/6/b/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^5/(
b*x+a)^3*a^4-7/12*b/(a*d-b*c)^5/g^5*B^2*d^3/(b*x+a)^3*a^2*c^2-13/16*b/(a*d-
b*c)^5/g^5*B^2*d^3/(b*x+a)^2*a*c^2+1/2*b^4/(a*d-b*c)^5/g^5*A*B*ln(d*e/b-e*(
a*d-b*c)/b/(b*x+a))/(b*x+a)^4*c^5+1/6/b/(a*d-b*c)^5/g^5*A*B*d^5/(b*x+a)^3*a
^4-5/16*b/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a^3*d^3*c^2+5/16*b^2/(a*d-b*c)^5/g^
5*B^2/(b*x+a)^4*a^2*d^2*c^3-5/32*b^3/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*a*d*c^4+
1/8/b/(a*d-b*c)^5/g^5*A*B/(b*x+a)^4*a^5*d^5-2/3/(a*d-b*c)^5/g^5*A*B*d^4/(b*
x+a)^3*a^3*c-5/8/(a*d-b*c)^5/g^5*A*B/(b*x+a)^4*a^4*d^4*c-3/4/(a*d-b*c)^5/g^
5*A*B*d^4/(b*x+a)^2*a^2*c-1/(a*d-b*c)^5/g^5*A*B*d^4/(b*x+a)*a*c+1/8/b/(a*d-
b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^5*d^5+1/2/b/(a*d
-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^5/(b*x+a)*a^2+1/2*b/(a*d-
b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^3/(b*x+a)*c^2-2/3/(a*d-b*c
)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4/(b*x+a)^3*a^3*c-5/8/(a*d-b*
c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*a^4*d^4*c-1/(a*d-b*c
)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4/(b*x+a)*a*c+5/4/(a*d-b*c)^5
/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^4*a^4*d^4*c-3/4/(a*d-b*c
)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^4/(b*x+a)^2*a^2*c-1/4/b/(a*d-
b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^4*a^5*d^5+1/6*b^3/
(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d/(b*x+a)^3*c^4+1/4/b/(
a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))*d^5/(b*x+a)^2*a^3+7/18*b
^2/(a*d-b*c)^5/g^5*B^2*d^2/(b*x+a)^3*a*c^3-5/4*b^3/(a*d-b*c)^5/g^5*A^2/(b*x
+a)^4*a*d*c^4+1/2/b/(a*d-b*c)^5/g^5*A*B*d^5/(b*x+a)*a^2+1/2*b/(a*d-b*c)^5/g
^5*A*B*d^3/(b*x+a)*c^2-1/4*b^2/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(
b*x+a))*d^2/(b*x+a)^2*c^3+1/2/b/(a*d-b*c)^5/g^5*A*B*ln(d*e/b-e*(a*d-b*c)/b/
(b*x+a))*d^5*a+3/4*b/(a*d-b*c)^5/g^5*A*B*d^3/(b*x+a)^2*a*c^2+5/4*b/(a*d-b*c
)^5/g^5*A*B/(b*x+a)^4*a^3*d^3*c^2+b/(a*d-b*c)^5/g^5*A*B*d^3/(b*x+a)^3*a^2*c
^2-2/3*b^2/(a*d-b*c)^5/g^5*A*B*d^2/(b*x+a)^3*a*c^3+1/4*b^4/(a*d-b*c)^5/g^5*
A^2/(b*x+a)^4*c^5+1/32*b^4/(a*d-b*c)^5/g^5*B^2/(b*x+a)^4*c^5+25/24/(a*d-b*c
)^5/g^5*A*B*d^4*c-25/24/b/(a*d-b*c)^5/g^5*A*B*d^5*a-1/8*b^4/(a*d-b*c)^5/g^5
*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))/(b*x+a)^4*c^5+25/12/(a*d-b*c)^5/g^5*B^
2*d^4/(b*x+a)*a*c+13/16/(a*d-b*c)^5/g^5*B^2*d^4/(b*x+a)^2*a^2*c+7/18/(a*d-b
*c)^5/g^5*B^2*d^4/(b*x+a)^3*a^3*c-1/4/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b
*c)/b/(b*x+a))^2*d^4*c-1/2/(a*d-b*c)^5/g^5*A*B*ln(d*e/b-e*(a*d-b*c)/b/(b*x+
a))*d^4*c-1/8*b^4/(a*d-b*c)^5/g^5*A*B/(b*x+a)^4*c^5-1/32/b/(a*d-b*c)^5/g^5*
B^2/(b*x+a)^4*a^5*d^5-25/24/b/(a*d-b*c)^5/g^5*B^2*d^5/(b*x+a)*a^2-25/24*b/(
a*d-b*c)^5/g^5*B^2*d^3/(b*x+a)*c^2+25/24/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*

```
d-b*c)/b/(b*x+a))*d^4*c-1/4/(a*d-b*c)^5/g^5*A^2*d^4*c+415/288/b/(a*d-b*c)^5
/g^5*B^2*d^5*a-415/288/(a*d-b*c)^5/g^5*B^2*d^4*c+5/32/(a*d-b*c)^5/g^5*B^2/(
b*x+a)^4*a^4*d^4*c+5/4/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a^4*d^4*c+13/48*b^2/(a
*d-b*c)^5/g^5*B^2*d^2/(b*x+a)^2*c^3-1/4/b/(a*d-b*c)^5/g^5*A^2/(b*x+a)^4*a^5
*d^5-7/72*b^3/(a*d-b*c)^5/g^5*B^2*d/(b*x+a)^3*c^4-13/48/b/(a*d-b*c)^5/g^5*B
^2*d^5/(b*x+a)^2*a^3-7/72/b/(a*d-b*c)^5/g^5*B^2*d^5/(b*x+a)^3*a^4+1/4/b/(a*
d-b*c)^5/g^5*A^2*d^5*a-25/24/b/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(
b*x+a))*d^5*a+1/4/b/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2*d
^5*a+1/4*b^4/(a*d-b*c)^5/g^5*B^2*ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))^2/(b*x+a)^
4*c^5
```

Maxima [B] time = 2.29015, size = 2865, normalized size = 5.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x, algorithm="maxima
")
```

```
[Out] -1/288*(12*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 +
 25*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^
2 + 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*
d^3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d
^3)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*
d^3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2
*d^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)
*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^
4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(d*e*x/
(b*x + a) + c*e/(b*x + a)) + (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*
d^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(
13*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a
)^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
 + a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^
2*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2
*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100
*a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b
^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)
*log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6
*b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a
```

```
*b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*
g^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
 4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^
6*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5
)*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 -
4*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 - 1/24*A*B*((12*b^3*d^3*x^3
- 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 -
 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c
^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3
- 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3
 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^
3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 -
 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 12*log(d*e*x/(b*x +
a) + c*e/(b*x + a))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*
a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d
+ 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x +
c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*
d^4)*g^5)) - 1/4*B^2*log(d*e*x/(b*x + a) + c*e/(b*x + a))^2/(b^5*g^5*x^4 +
4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^
2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^
4*b*g^5)
```

Fricas [B] time = 1.38743, size = 2152, normalized size = 4.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x, algorithm="fricas
")
```

```
[Out] -1/288*(9*(8*A^2 - 4*A*B + B^2)*b^4*c^4 - 32*(9*A^2 - 6*A*B + 2*B^2)*a*b^3*
c^3*d + 216*(2*A^2 - 2*A*B + B^2)*a^2*b^2*c^2*d^2 - 288*(A^2 - 2*A*B + 2*B^
2)*a^3*b*c*d^3 + (72*A^2 - 300*A*B + 415*B^2)*a^4*d^4 + 12*((12*A*B - 25*B^
2)*b^4*c*d^3 - (12*A*B - 25*B^2)*a*b^3*d^4)*x^3 - 6*((12*A*B - 13*B^2)*b^4*
c^2*d^2 - 16*(6*A*B - 11*B^2)*a*b^3*c*d^3 + (84*A*B - 163*B^2)*a^2*b^2*d^4)
*x^2 - 72*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 +
4*B^2*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2
 + 4*B^2*a^3*b*c*d^3)*log((d*e*x + c*e)/(b*x + a))^2 + 4*((12*A*B - 7*B^2)*
b^4*c^3*d - 12*(6*A*B - 5*B^2)*a*b^3*c^2*d^2 + 108*(2*A*B - 3*B^2)*a^2*b^2*
c*d^3 - (156*A*B - 271*B^2)*a^3*b*d^4)*x - 12*((12*A*B - 25*B^2)*b^4*d^4*x^
4 - 3*(4*A*B - B^2)*b^4*c^4 + 16*(3*A*B - B^2)*a*b^3*c^3*d - 36*(2*A*B - B^
```

```
2)*a^2*b^2*c^2*d^2 + 48*(A*B - B^2)*a^3*b*c*d^3 - 4*(3*B^2*b^4*c*d^3 - 2*(6
*A*B - 11*B^2)*a*b^3*d^4)*x^3 + 6*(B^2*b^4*c^2*d^2 - 8*B^2*a*b^3*c*d^3 + 6*
(2*A*B - 3*B^2)*a^2*b^2*d^4)*x^2 - 4*(B^2*b^4*c^3*d - 6*B^2*a*b^3*c^2*d^2 +
 18*B^2*a^2*b^2*c*d^3 - 12*(A*B - B^2)*a^3*b*d^4)*x)*log((d*e*x + c*e)/(b*x
 + a)))/((b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a
^4*b^5*d^4)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 -
4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d +
 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^
4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^
5*x + (a^4*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3
+ a^8*b*d^4)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)/(b*x+a)))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2}{\left(bgx+ag\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)/(b*x+a)))^2/(b*g*x+a*g)^5,x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)*e/(b*x + a)) + A)^2/(b*g*x + a*g)^5, x)
```

3.191 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Rubi [A] time = 0.1956, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-1), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x] + b^2*g^2*Defer[Int
][x^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx &= \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx+\left(b^2g^2\right)\int \frac{x^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.586605, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Maple [A] time = 1.224, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2}\left(A+B\ln\left(\frac{e\left(dx+c\right)}{bx+a}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^{2}}{B\log\left(\frac{(dx+c)e}{bx+a}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)*e/(b*x + a)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^{2}g^{2}x^{2}+2\,abg^{2}x+a^{2}g^{2}}{B\log\left(\frac{dex+ce}{bx+a}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((d*e*x + c*e)/(b*x +
a)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{B\log\left(\frac{(dx+c)e}{bx+a}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)*e/(b*x + a)) + A), x)
```

3.192 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$

Optimal. Leaf size=32

$$\text{Unintegrable}\left(\frac{ag+bgx}{B\log\left(\frac{e(c+dx)}{a+bx}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Rubi [A] time = 0.10057, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-1), x] + b*g*Defer[In
t][x/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}+\frac{bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\right)dx\\ &= (ag)\int \frac{1}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.236994, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)]), x]
```

Maple [A] time = 1.047, size = 0, normalized size = 0.

$$\int (bgx+ag)\left(A+B\ln\left(\frac{e\,(dx+c)}{bx+a}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{B\log\left(\frac{(dx+c)e}{bx+a}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)*e/(b*x + a)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bgx+ag}{B\log\left(\frac{dex+ce}{bx+a}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B*log((d*e*x + c*e)/(b*x + a)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B \log\left(\frac{(dx+c)e}{bx+a}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)*e/(b*x + a)) + A), x)
```

3.193 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi [A] time = 0.0730861, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]

[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Mathematica [A] time = 0.235204, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]

[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Maple [A] time = 1.347, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e(dx+c)}{bx+a}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)

[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima")

[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{1}{Abgx+Aag+\left(Bbgx+Bag\right)\log\left(\frac{dex+ce}{bx+a}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((d*e*x + c*e)/(b*x + a)
)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

3.194 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$

Optimal. Leaf size=53

$$-\frac{e^{-\frac{A}{B}}\operatorname{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{Beg^2(bc-ad)}$$

```
[Out] -(ExpIntegralEi[(A + B*Log[(e*(c + d*x))/(a + b*x)])/B]/(B*(b*c - a*d)*e*E^
(A/B)*g^2))
```

Rubi [F] time = 0.0858857, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Mathematica [A] time = 0.0639659, size = 50, normalized size = 0.94

$$\frac{e^{-\frac{A}{B}}\operatorname{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{Beg^2(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]]/(B*(-(b*c) + a*d)*e*E^(A/
B)*g^2)
```

Maple [A] time = 0.286, size = 69, normalized size = 1.3

$$-\frac{1}{e\left(ad-bc\right)g^{2}B}\mathrm{e}^{-\frac{A}{B}}\mathrm{Ei}\left(1,-\ln\left(\frac{de}{b}-\frac{e\left(ad-bc\right)}{b\left(bx+a\right)}\right)-\frac{A}{B}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] -1/e/(a*d-b*c)/g^2/B*exp(-A/B)*Ei(1,-ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))-A/B)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

Fricas [A] time = 0.979911, size = 109, normalized size = 2.06

$$-\frac{e^{\left(-\frac{A}{B}\right)}\operatorname{log\_integral}\left(\frac{(dex+ce)e^{\frac{A}{B}}}{bx+a}\right)}{(Bbc-Bad)eg^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas
")
```

```
[Out] -e^(-A/B)*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a))/((B*b*c - B*a*d)*e*
g^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

3.195 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$

Optimal. Leaf size=109

$$\frac{de^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{Beg^3(bc-ad)^2}-\frac{be^{-\frac{2A}{B}}\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)}{Be^2g^3(bc-ad)^2}$$

```
[Out] (d*ExpIntegralEi[(A + B*Log[(e*(c + d*x))/(a + b*x)])/B])/(B*(b*c - a*d)^2*
e*E^(A/B)*g^3) - (b*ExpIntegralEi[(2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/
B])/(B*(b*c - a*d)^2*e^2*E^((2*A)/B)*g^3)
```

Rubi [F] time = 0.0719976, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}\,dx$$

Mathematica [A] time = 0.157746, size = 89, normalized size = 0.82

$$\frac{e^{-\frac{2A}{B}}\left(dee^{A/B}\text{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)-b\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)\right)}{Be^2g^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])),x]
```

```
[Out] (d*e*E^(A/B)*ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]] - b*ExpInteg
ralEi[(2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/B])/(B*(b*c - a*d)^2*e^2*E^(
(2*A)/B)*g^3)
```

Maple [F] time = 1.425, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^3}\left(A+B\ln\left(\frac{e(dx+c)}{bx+a}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^3\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="maxima
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

Fricas [A] time = 0.976792, size = 286, normalized size = 2.62

$$\frac{\left(dee^{\frac{A}{B}}\,\mathrm{log\_integral}\left(\frac{(dex+ce)e^{\frac{A}{B}}}{bx+a}\right)-b\,\mathrm{log\_integral}\left(\frac{\left(d^2e^2x^2+2\,cde^2x+c^2e^2\right)e^{\left(\frac{2\,A}{B}\right)}}{b^2x^2+2\,abx+a^2}\right)\right)e^{\left(-\frac{2\,A}{B}\right)}}{\left(Bb^2c^2-2\,Babcd+Ba^2d^2\right)e^2g^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="fricas
")
```

```
[Out] (d*e*e^(A/B)*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a)) - b*log_integral
((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)*e^(2*A/B)/(b^2*x^2 + 2*a*b*x + a^2))
)*e^(-2*A/B)/((B*b^2*c^2 - 2*B*a*b*c*d + B*a^2*d^2)*e^2*g^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)/(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)*e/(b*x + a)) + A)), x)
```

3.196 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

Rubi [A] time = 0.206335, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-2), x] + 2*a*b*g^
2*Defer[Int][x/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x] + b^2*g^2*Defer[I
nt][x^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx = \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\right)dx$$

$$= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx+\left(b^2g^2\right)\int$$

Mathematica [A] time = 1.3554, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

Maple [A] time = 1.11, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\,(dx+c)}{bx+a}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^3dg^2x^4+a^3cg^2+\left(b^3cg^2+3\,ab^2dg^2\right)x^3+3\left(ab^2cg^2+a^2bdg^2\right)x^2+\left(3\,a^2bcg^2+a^3dg^2\right)x}{(bc-ad)B^2\log\left(bx+a\right)-(bc-ad)B^2\log\left(dx+c\right)-(bc-ad)AB-(bc\log\left(e\right)-ad\log\left(e\right))B^2}+\int\frac{4\,b^3dg^2x^3+3}{(bc-ad)B^2\log\left(bx+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] -(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^2*c*
g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/((b*c - a*d)*B^2*lo
g(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*log(e) -
 a*d*log(e))*B^2) + integrate((4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2 + a^3*d*g^2
+ 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*g^2)*x)/((b*
c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B
```

```
- (b*c*log(e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B^2\log\left(\frac{dex+ce}{bx+a}\right)^2 + 2\,AB\log\left(\frac{dex+ce}{bx+a}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((d*e*x + c*e)/(b*x
+ a))^2 + 2*A*B*log((d*e*x + c*e)/(b*x + a)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx + ag\right)^2}{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)*e/(b*x + a)) + A)^2, x)
```

3.197 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=32

$$\text{Unintegrable}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2},x\right)$$

[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]

Rubi [A] time = 0.106045, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]

[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x))/(a + b*x)])^(-2), x] + b*g*Defer[Int][x/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.944556, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x))/(a + b*x)])^2, x]
```

Maple [A] time = 1.129, size = 0, normalized size = 0.

$$\int (bgx + ag)\left(A + B\ln\left(\frac{e\,(dx + c)}{bx + a}\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^2dgx^3 + a^2cg + \left(b^2cg + 2\,abdg\right)x^2 + \left(2\,abcg + a^2dg\right)x}{(bc - ad)B^2\log\left(bx + a\right) - (bc - ad)B^2\log\left(dx + c\right) - (bc - ad)AB - \left(bc\log\left(e\right) - ad\log\left(e\right)\right)B^2} + \int \frac{}{(bc - ad)B^2\log\left(bx\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima")
```

```
[Out] -(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*d*g)
*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) - (b*c - a
*d)*A*B - (b*c*log(e) - a*d*log(e))*B^2) + integrate((3*b^2*d*g*x^2 + 2*a*b
*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/((b*c - a*d)*B^2*log(b*x + a) -
 (b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*log(e) - a*d*log(e))
*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bgx + ag}{B^2\log\left(\frac{dex+ce}{bx+a}\right)^2 + 2\,AB\log\left(\frac{dex+ce}{bx+a}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((d*e*x + c*e)/(b*x + a))^2 + 2*A*B*log((d*e
*x + c*e)/(b*x + a)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{\left(B\log\left(\frac{(dx+c)e}{bx+a}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)*e/(b*x + a)) + A)^2, x)
```

3.198 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi [A] time = 0.0786841, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.514056, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Maple [A] time = 1.079, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\left(dx+c\right)}{bx+a}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$d\int \frac{1}{\left(bcg-adg\right)B^2\log\left(bx+a\right)-\left(bcg-adg\right)B^2\log\left(dx+c\right)-\left(bcg-adg\right)AB-\left(bcg\log\left(e\right)-adg\log\left(e\right)\right)B^2}\,dx-\frac{}{\left(bcg-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxima
")
```

```
[Out] d*integrate(1/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d
*x + c) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2), x) - (d
*x + c)/((b*c*g - a*d*g)*B^2*log(b*x + a) - (b*c*g - a*d*g)*B^2*log(d*x + c
) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$${\rm integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{dex+ce}{bx+a}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{dex+ce}{bx+a}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d*e*x + c*e)/(
b*x + a))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((d*e*x + c*e)/(b*x + a))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx + ag)\left(B\log\left(\frac{(dx+c)e}{bx+a}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)*e/(b*x + a)) + A)^2), x)
```

3.199 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=104

$$\frac{c+dx}{Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}-\frac{e^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{B^2eg^2(bc-ad)}$$

```
[Out] -(ExpIntegralEi[(A + B*Log[(e*(c + d*x))/(a + b*x)])/B]/(B^2*(b*c - a*d)*e*
E^(A/B)*g^2)) + (c + d*x)/(B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(c + d
*x))/(a + b*x)]))
```

Rubi [F] time = 0.0886496, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.124988, size = 88, normalized size = 0.85

$$\frac{\frac{e^{-\frac{A}{B}}\text{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{e}-\frac{B(c+dx)}{(a+bx)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}}{B^2g^2(ad-bc)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] (ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]]/(e*E^(A/B)) - (B*(c + d*
x))/((a + b*x)*(A + B*Log[(e*(c + d*x))/(a + b*x)])))/(B^2*(-(b*c) + a*d)*g
^2)
```

Maple [B] time = 0.16, size = 258, normalized size = 2.5

$$-\frac{d}{(ad-bc)\,g^2B^2b}\left(\ln\left(\frac{de}{b}-\frac{e\,(ad-bc)}{b\,(bx+a)}\right)+\frac{A}{B}\right)^{-1}+\frac{ad}{(ad-bc)\,g^2B^2b\,(bx+a)}\left(\ln\left(\frac{de}{b}-\frac{e\,(ad-bc)}{b\,(bx+a)}\right)+\frac{A}{B}\right)^{-1}-\frac{}{(ad-bc)\,g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] -1/(a*d-b*c)/g^2/B^2/(ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))+A/B)*d/b+1/(a*d-b*c)/
g^2/B^2/(ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))+A/B)/b/(b*x+a)*a*d-1/(a*d-b*c)/g^2
/B^2/(ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))+A/B)/(b*x+a)*c-1/e/(a*d-b*c)/g^2/B^2*
exp(-A/B)*Ei(1,-ln(d*e/b-e*(a*d-b*c)/b/(b*x+a))-A/B)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{dx+c}{\left(abcg^2-a^2dg^2\right)AB+\left(abcg^2\log(e)-a^2dg^2\log(e)\right)B^2+\left(\left(b^2cg^2-abdg^2\right)AB+\left(b^2cg^2\log(e)-abdg^2\log(e)\right)B^2\right)x-\left(\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxi
ma")
```

```
[Out] (d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2*log(
e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2*log(
e))*B^2)*x - ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^2)*
log(b*x + a) + ((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)*B^2
)*log(d*x + c)) + integrate(1/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2 + (B^2*b^2*
g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b*g^2)*x - (B
^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a) + (B^2*b^2*g^2
```

```
*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

Fricas [B] time = 0.970356, size = 439, normalized size = 4.22

$$\frac{(Bdex+Bce)e^{\frac{A}{B}}-\left(Abx+Aa+(Bbx+Ba)\log\left(\frac{dex+ce}{bx+a}\right)\right)\operatorname{log\_integral}\left(\frac{(dex+ce)e^{\frac{A}{B}}}{bx+a}\right)}{\left(\left(B^3b^2c-B^3abd\right)eg^2x+\left(B^3abc-B^3a^2d\right)eg^2\right)e^{\frac{A}{B}}\log\left(\frac{dex+ce}{bx+a}\right)+\left(\left(AB^2b^2c-AB^2abd\right)eg^2x+\left(AB^2abc-AB^2a^2d\right)eg^2\right)e^{\frac{A}{B}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fric
as")
```

```
[Out] ((B*d*e*x + B*c*e)*e^(A/B) - (A*b*x + A*a + (B*b*x + B*a)*log((d*e*x + c*e)
/(b*x + a)))*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a)))/(((B^3*b^2*c -
B^3*a*b*d)*e*g^2*x + (B^3*a*b*c - B^3*a^2*d)*e*g^2)*e^(A/B)*log((d*e*x + c*
e)/(b*x + a)) + ((A*B^2*b^2*c - A*B^2*a*b*d)*e*g^2*x + (A*B^2*a*b*c - A*B^2
*a^2*d)*e*g^2)*e^(A/B))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.41631, size = 344, normalized size = 3.31

$$-\frac{\operatorname{Ei}\left(\frac{A}{B}+\log\left(\frac{dx+c}{bx+a}\right)+1\right)e^{\left(-\frac{A}{B}-1\right)}}{B^2bcg^2-B^2adg^2}+\frac{}{B^2b^2cg^2x\log\left(\frac{dx+c}{bx+a}\right)-B^2abdg^2x\log\left(\frac{dx+c}{bx+a}\right)+ABb^2cg^2x+B^2b^2cg^2x-ABabdg^2x-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac
")
```

```
[Out] -Ei(A/B + log((d*x + c)/(b*x + a)) + 1)*e^(-A/B - 1)/(B^2*b*c*g^2 - B^2*a*d
*g^2) + (d*x + c)/(B^2*b^2*c*g^2*x*log((d*x + c)/(b*x + a)) - B^2*a*b*d*g^2
*x*log((d*x + c)/(b*x + a)) + A*B*b^2*c*g^2*x + B^2*b^2*c*g^2*x - A*B*a*b*d
*g^2*x - B^2*a*b*d*g^2*x + B^2*a*b*c*g^2*log((d*x + c)/(b*x + a)) - B^2*a^2
*d*g^2*log((d*x + c)/(b*x + a)) + A*B*a*b*c*g^2 + B^2*a*b*c*g^2 - A*B*a^2*d
*g^2 - B^2*a^2*d*g^2)
```

3.200 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$

Optimal. Leaf size=159

$$-\frac{2be^{-\frac{2A}{B}}\,\text{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)}{B^2e^2g^3(bc-ad)^2}+\frac{de^{-\frac{A}{B}}\,\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)}{a+bx}\right)}{B}\right)}{B^2eg^3(bc-ad)^2}+\frac{c+dx}{Bg^3(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}$$

```
[Out] (d*ExpIntegralEi[(A + B*Log[(e*(c + d*x))/(a + b*x)])/B])/(B^2*(b*c - a*d)^
2*e*E^(A/B)*g^3) - (2*b*ExpIntegralEi[(2*(A + B*Log[(e*(c + d*x))/(a + b*x)
]))/B])/(B^2*(b*c - a*d)^2*e^2*E^((2*A)/B)*g^3) + (c + d*x)/(B*(b*c - a*d)*
g^3*(a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))
```

Rubi [F] time = 0.0797503, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.431304, size = 135, normalized size = 0.85

$$\frac{-\frac{2be^{-\frac{2A}{B}}\operatorname{Ei}\left(\frac{2\left(A+B\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{B}\right)}{e^2}+\frac{de^{-\frac{A}{B}}\operatorname{Ei}\left(\frac{A}{B}+\log\left(\frac{e(c+dx)}{a+bx}\right)\right)}{e}+\frac{B(c+dx)(bc-ad)}{(a+bx)^2\left(B\log\left(\frac{e(c+dx)}{a+bx}\right)+A\right)}}{B^2g^3(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x))/(a + b*x)])^2),x]
```

```
[Out] ((d*ExpIntegralEi[A/B + Log[(e*(c + d*x))/(a + b*x)]])/(e*E^(A/B)) - (2*b*E
xpIntegralEi[(2*(A + B*Log[(e*(c + d*x))/(a + b*x)]))/B])/(e^2*E^((2*A)/B))
 + (B*(b*c - a*d)*(c + d*x))/((a + b*x)^2*(A + B*Log[(e*(c + d*x))/(a + b*x
)])))/(B^2*(b*c - a*d)^2*g^3)
```

Maple [F] time = 1.582, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3}\left(A+B\ln\left(\frac{e\,(dx+c)}{bx+a}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)/(b*x+a)))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="maxi
ma")
```

```
[Out] (d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d*g^3*
log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b^2*d*
```

```
g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g^3*lo
g(e) - a^2*b*d*g^3*log(e))*B^2)*x - ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*
(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(b*x
+ a) + ((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*B
^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate(-(b*d*x + 2
*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e) - a*b^3*d*g
^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*g^3*log(e) -
 a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B + (a*b^3*c*g^
3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 - a^3*b*d*g^3
)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x - ((b^4*c*g^3 -
a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2
*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*log(b*x + a) +
 ((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x
^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)
*log(d*x + c)), x)
```

Fricas [B] time = 1.06759, size = 1212, normalized size = 7.62

$$\frac{\left(\left(Bbcd - Bad^2\right)e^2x + \left(Bbc^2 - Bacd\right)e^2\right)e^{\left(\frac{2A}{B}\right)} - 2\left(Ab^3x^2 + 2\,Aab^2x + Aa^2b + \left(Bb^3x^2 + 2\,Bab^2x + Ba^2b\right)\log\right.}{\left(\left(B^3b^4c^2 - 2\,B^3ab^3cd + B^3a^2b^2d^2\right)e^2g^3x^2 + 2\left(B^3ab^3c^2 - 2\,B^3a^2b^2cd + B^3a^3bd^2\right)e^2g^3x + \left(B^3a^2b^2c^2 - 2\,B^3a^3bcd + B^3a^4d^2\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="fric
as")
```

```
[Out] (((B*b*c*d - B*a*d^2)*e^2*x + (B*b*c^2 - B*a*c*d)*e^2)*e^(2*A/B) - 2*(A*b^3
*x^2 + 2*A*a*b^2*x + A*a^2*b + (B*b^3*x^2 + 2*B*a*b^2*x + B*a^2*b)*log((d*e
*x + c*e)/(b*x + a)))*log_integral((d^2*e^2*x^2 + 2*c*d*e^2*x + c^2*e^2)*e^
(2*A/B)/(b^2*x^2 + 2*a*b*x + a^2)) + ((B*b^2*d*e*x^2 + 2*B*a*b*d*e*x + B*a^
2*d*e)*e^(A/B)*log((d*e*x + c*e)/(b*x + a)) + (A*b^2*d*e*x^2 + 2*A*a*b*d*e*
x + A*a^2*d*e)*e^(A/B))*log_integral((d*e*x + c*e)*e^(A/B)/(b*x + a)))/(((B
^3*b^4*c^2 - 2*B^3*a*b^3*c*d + B^3*a^2*b^2*d^2)*e^2*g^3*x^2 + 2*(B^3*a*b^3*
c^2 - 2*B^3*a^2*b^2*c*d + B^3*a^3*b*d^2)*e^2*g^3*x + (B^3*a^2*b^2*c^2 - 2*B
^3*a^3*b*c*d + B^3*a^4*d^2)*e^2*g^3)*e^(2*A/B)*log((d*e*x + c*e)/(b*x + a))
 + ((A*B^2*b^4*c^2 - 2*A*B^2*a*b^3*c*d + A*B^2*a^2*b^2*d^2)*e^2*g^3*x^2 + 2
*(A*B^2*a*b^3*c^2 - 2*A*B^2*a^2*b^2*c*d + A*B^2*a^3*b*d^2)*e^2*g^3*x + (A*B
^2*a^2*b^2*c^2 - 2*A*B^2*a^3*b*c*d + A*B^2*a^4*d^2)*e^2*g^3)*e^(2*A/B))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)/(b*x+a)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^3\left(B\log\left(\frac{(dx+c)e}{bx+a}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)/(b*x+a)))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)*e/(b*x + a)) + A)^2), x)
```

3.201 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx$

Optimal. Leaf size=182

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5b}-\frac{2Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}-\frac{2Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}+\frac{2Bg^4(bc-a}{5}$$

```
[Out] (-2*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(5*b
*d^3) - (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) + (B*(b*c - a*d)*g^4
*(a + b*x)^4)/(10*b*d) + (2*B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5) + (
g^4*(a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b)
```

Rubi [A] time = 0.117856, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^4(a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5b}-\frac{2Bg^4x(bc-ad)^4}{5d^4}+\frac{Bg^4(a+bx)^2(bc-ad)^3}{5bd^3}-\frac{2Bg^4(a+bx)^3(bc-ad)^2}{15bd^2}+\frac{2Bg^4(bc-a}{5}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (-2*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (B*(b*c - a*d)^3*g^4*(a + b*x)^2)/(5*b
*d^3) - (2*B*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) + (B*(b*c - a*d)*g^4
*(a + b*x)^4)/(10*b*d) + (2*B*(b*c - a*d)^5*g^4*Log[c + d*x])/(5*b*d^5) + (
g^4*(a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)dx &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5b}-\frac{B\int\frac{2(-bc+ad)g^5(a+bx)^4}{c+dx}\,dx}{5bg}\\ &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5b}+\frac{\left(2B(bc-ad)g^4\right)\int\frac{(a+bx)^4}{c+dx}\,dx}{5b}\\ &= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5b}+\frac{\left(2B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3}{d^4}+\frac{b(bc-\cdots}{\cdots}\right.}{\cdots}\\ &= -\frac{2B(bc-ad)^4g^4x}{5d^4}+\frac{B(bc-ad)^3g^4(a+bx)^2}{5bd^3}-\frac{2B(bc-ad)^2g^4(a+bx)^3}{15bd^2}+\cdots\end{aligned}$$

Mathematica [A] time = 0.100684, size = 144, normalized size = 0.79

$$\frac{g^4\left((a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-\frac{B(ad-bc)\left(6d^2(a+bx)^2(bc-ad)^2+4d^3(a+bx)^3(ad-bc)-12bdx(bc-ad)^3+12(bc-ad)^4\log(c+dx)+3d^4(a+bx)^4\right)}{6d^5}\right)}{5b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g^4*(-(B*(-(b*c) + a*d)*(-12*b*d*(b*c - a*d)^3*x + 6*d^2*(b*c - a*d)^2*(a
+ b*x)^2 + 4*d^3*(-(b*c) + a*d)*(a + b*x)^3 + 3*d^4*(a + b*x)^4 + 12*(b*c -
 a*d)^4*Log[c + d*x]))/(6*d^5) + (a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a
+ b*x)^2])))/(5*b)
```

Maple [B] time = 0.415, size = 1030, normalized size = 5.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] 2/5/b*g^4*B*a^5*ln(1/(b*x+a))-2/5/b*g^4*B*a^5*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-
d)+1/5*b^4*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x^5*g^4+1/10*b^4*g^4
*B*c/d*x^4+1/5*b^4*g^4*B*c^3/d^3*x^2-2/15*b^4*g^4*B*c^2/d^2*x^3+2*g^4*B*a^4
/d*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c-2*g^4*B*a^4/d*ln(1/(b*x+a))*c+2*b*B*ln
(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x^2*a^3*g^4-2/5*b^4*g^4*B*c^4/d^4*x
+2/5*b^4*g^4*B*c^5/d^5*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)-2/5*b^4*g^4*B*c^5/d^
5*ln(1/(b*x+a))+2*b^2*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x^3*a^2*g
^4+b^3*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x^4*a*g^4+9/5*b^2*g^4*B*
a^2/d^3*c^3-2/5*b^3*g^4*B*a/d^4*c^4-47/15*b*g^4*B*a^3/d^2*c^2+77/30*g^4*B*a
^4/d*c-5/6/b*g^4*B*a^5+1/5*b^4*A*x^5*g^4+A*x*a^4*g^4-8/5*B*x*a^4*g^4+1/5/b*
A*a^5*g^4+1/5/b*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*a^5*g^4+b^3*A*x
^4*a*g^4+2*b^2*A*x^3*a^2*g^4+2*b*A*x^2*a^3*g^4-1/10*b^3*B*x^4*a*g^4-8/15*b^
2*B*x^3*a^2*g^4-6/5*b*B*x^2*a^3*g^4+B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/
b^2)*x*a^4*g^4+4*b*g^4*B*c/d*x*a^3+4*b*g^4*B*a^3/d^2*ln(1/(b*x+a))*c^2-4*b*
g^4*B*a^3/d^2*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c^2+2*b^3*g^4*B*a/d^4*ln(1/(b
*x+a))*c^4-2*b^3*g^4*B*a/d^4*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c^4+4*b^2*g^4*
B*a^2/d^3*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c^3-b^3*g^4*B*c^2/d^2*x^2*a-4*b^2
*g^4*B*a^2/d^3*ln(1/(b*x+a))*c^3+2*b^2*g^4*B*c/d*x^2*a^2-4*b^2*g^4*B*c^2/d^
2*x*a^2+2*b^3*g^4*B*c^3/d^3*a*x+2/3*b^3*g^4*B*c/d*x^3*a
```

Maxima [B] time = 1.34761, size = 1191, normalized size = 6.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/5*A*b^4*g^4*x^5 + A*a*b^3*g^4*x^4 + 2*A*a^2*b^2*g^4*x^3 + 2*A*a^3*b*g^4*x
^2 + (x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*
b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/b + 2*c*lo
g(d*x + c)/d)*B*a^4*g^4 + 2*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) +
2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*
```

```
a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*B*a^
3*b*g^4 + 2*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x
^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)
/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2
*d^2)*x)/(b^2*d^2))*B*a^2*b^2*g^4 + 1/3*(3*x^4*log(d^2*e*x^2/(b^2*x^2 + 2*a
*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*
x + a^2)) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2
 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x
)/(b^3*d^3))*B*a*b^3*g^4 + 1/30*(6*x^5*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a
^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)
) - 12*a^5*log(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (3*(b^4*c*d^3 - a*b
^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)
*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*b^4*g^4 + A*a^4*g^4*x
```

Fricas [B] time = 1.27888, size = 952, normalized size = 5.23

$$\frac{6\,Ab^5d^5g^4x^5 - 12\,Ba^5d^5g^4\log(bx+a) + 3\left(Bb^5cd^4 + (10\,A - B)ab^4d^5\right)g^4x^4 - 4\left(Bb^5c^2d^3 - 5\,Bab^4cd^4 - (15\,A - 4\,B)a^2b^3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] 1/30*(6*A*b^5*d^5*g^4*x^5 - 12*B*a^5*d^5*g^4*log(b*x + a) + 3*(B*b^5*c*d^4
+ (10*A - B)*a*b^4*d^5)*g^4*x^4 - 4*(B*b^5*c^2*d^3 - 5*B*a*b^4*c*d^4 - (15*
A - 4*B)*a^2*b^3*d^5)*g^4*x^3 + 6*(B*b^5*c^3*d^2 - 5*B*a*b^4*c^2*d^3 + 10*B
*a^2*b^3*c*d^4 + 2*(5*A - 3*B)*a^3*b^2*d^5)*g^4*x^2 - 6*(2*B*b^5*c^4*d - 10
*B*a*b^4*c^3*d^2 + 20*B*a^2*b^3*c^2*d^3 - 20*B*a^3*b^2*c*d^4 - (5*A - 8*B)*
a^4*b*d^5)*g^4*x + 12*(B*b^5*c^5 - 5*B*a*b^4*c^4*d + 10*B*a^2*b^3*c^3*d^2 -
 10*B*a^3*b^2*c^2*d^3 + 5*B*a^4*b*c*d^4)*g^4*log(d*x + c) + 6*(B*b^5*d^5*g^
4*x^5 + 5*B*a*b^4*d^5*g^4*x^4 + 10*B*a^2*b^3*d^5*g^4*x^3 + 10*B*a^3*b^2*d^5
*g^4*x^2 + 5*B*a^4*b*d^5*g^4*x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^
2 + 2*a*b*x + a^2)))/(b*d^5)
```

Sympy [B] time = 8.81681, size = 1018, normalized size = 5.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b**4*g**4*x**5/5 - 2*B*a**5*g**4*log(x + (2*B*a**6*d**5*g**4/b + 10*B*a**
5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g**4 + 20*B*a**3*b**2*c**3*d**2*g**4
- 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b**4*c**5*g**4)/(2*B*a**5*d**5*g**4 +
10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g**4 + 20*B*a**2*b**3*c*
*3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**5*g**4))/(5*b) + 2*B*c
*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c
**3*d + b**4*c**4)*log(x + (12*B*a**5*c*d**4*g**4 - 20*B*a**4*b*c**2*d**3*g
**4 + 20*B*a**3*b**2*c**3*d**2*g**4 - 10*B*a**2*b**3*c**4*d*g**4 + 2*B*a*b*
*4*c**5*g**4 - 2*B*a*c*g**4*(5*a**4*d**4 - 10*a**3*b*c*d**3 + 10*a**2*b**2*
c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4) + 2*B*b*c**2*g**4*(5*a**4*d**4 - 1
0*a**3*b*c*d**3 + 10*a**2*b**2*c**2*d**2 - 5*a*b**3*c**3*d + b**4*c**4)/d)/
(2*B*a**5*d**5*g**4 + 10*B*a**4*b*c*d**4*g**4 - 20*B*a**3*b**2*c**2*d**3*g*
*4 + 20*B*a**2*b**3*c**3*d**2*g**4 - 10*B*a*b**4*c**4*d*g**4 + 2*B*b**5*c**
5*g**4))/(5*d**5) + (B*a**4*g**4*x + 2*B*a**3*b*g**4*x**2 + 2*B*a**2*b**2*g
**4*x**3 + B*a*b**3*g**4*x**4 + B*b**4*g**4*x**5/5)*log(e*(c + d*x)**2/(a +
 b*x)**2) + x**4*(10*A*a*b**3*d*g**4 - B*a*b**3*d*g**4 + B*b**4*c*g**4)/(10
*d) + x**3*(30*A*a**2*b**2*d**2*g**4 - 8*B*a**2*b**2*d**2*g**4 + 10*B*a*b**
3*c*d*g**4 - 2*B*b**4*c**2*g**4)/(15*d**2) + x**2*(10*A*a**3*b*d**3*g**4 -
6*B*a**3*b*d**3*g**4 + 10*B*a**2*b**2*c*d**2*g**4 - 5*B*a*b**3*c**2*d*g**4
+ B*b**4*c**3*g**4)/(5*d**3) + x*(5*A*a**4*d**4*g**4 - 8*B*a**4*d**4*g**4 +
 20*B*a**3*b*c*d**3*g**4 - 20*B*a**2*b**2*c**2*d**2*g**4 + 10*B*a*b**3*c**3
*d*g**4 - 2*B*b**4*c**4*g**4)/(5*d**4)
```

Giac [B] time = 162.637, size = 666, normalized size = 3.66

$$-\frac{2\,Ba^5g^4\log\left(bx+a\right)}{5\,b}+\frac{1}{5}\left(Ab^4g^4+Bb^4g^4\right)x^5+\frac{\left(Bb^4cg^4+10\,Aab^3dg^4+9\,Bab^3dg^4\right)x^4}{10\,d}-\frac{2\left(Bb^4c^2g^4-5\,Bab^3cdg^4-15\,A\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] -2/5*B*a^5*g^4*log(b*x + a)/b + 1/5*(A*b^4*g^4 + B*b^4*g^4)*x^5 + 1/10*(B*b
^4*c*g^4 + 10*A*a*b^3*d*g^4 + 9*B*a*b^3*d*g^4)*x^4/d - 2/15*(B*b^4*c^2*g^4
- 5*B*a*b^3*c*d*g^4 - 15*A*a^2*b^2*d^2*g^4 - 11*B*a^2*b^2*d^2*g^4)*x^3/d^2
+ 1/5*(B*b^4*g^4*x^5 + 5*B*a*b^3*g^4*x^4 + 10*B*a^2*b^2*g^4*x^3 + 10*B*a^3*
b*g^4*x^2 + 5*B*a^4*g^4*x)*log((d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*x
 + a^2)) + 1/5*(B*b^4*c^3*g^4 - 5*B*a*b^3*c^2*d*g^4 + 10*B*a^2*b^2*c*d^2*g^
4 + 10*A*a^3*b*d^3*g^4 + 4*B*a^3*b*d^3*g^4)*x^2/d^3 - 1/5*(2*B*b^4*c^4*g^4
```

```
- 10*B*a*b^3*c^3*d*g^4 + 20*B*a^2*b^2*c^2*d^2*g^4 - 20*B*a^3*b*c*d^3*g^4 -
5*A*a^4*d^4*g^4 + 3*B*a^4*d^4*g^4)*x/d^4 + 2/5*(B*b^4*c^5*g^4 - 5*B*a*b^3*c
^4*d*g^4 + 10*B*a^2*b^2*c^3*d^2*g^4 - 10*B*a^3*b*c^2*d^3*g^4 + 5*B*a^4*c*d^
4*g^4)*log(d*x + c)/d^5
```

3.202 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx$

Optimal. Leaf size=151

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{4b}+\frac{Bg^3x(bc-ad)^3}{2d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}+\frac{Bg^3(a+bx)}{6b}$$

```
[Out] (B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(4*b*d^
2) + (B*(b*c - a*d)*g^3*(a + b*x)^3)/(6*b*d) - (B*(b*c - a*d)^4*g^3*Log[c +
 d*x])/(2*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]
))/(4*b)
```

Rubi [A] time = 0.0982844, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^3(a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{4b}+\frac{Bg^3x(bc-ad)^3}{2d^3}-\frac{Bg^3(a+bx)^2(bc-ad)^2}{4bd^2}-\frac{Bg^3(bc-ad)^4\log(c+dx)}{2bd^4}+\frac{Bg^3(a+bx)}{6b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (B*(b*c - a*d)^3*g^3*x)/(2*d^3) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2)/(4*b*d^
2) + (B*(b*c - a*d)*g^3*(a + b*x)^3)/(6*b*d) - (B*(b*c - a*d)^4*g^3*Log[c +
 d*x])/(2*b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]
))/(4*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4b} - \frac{B\int\frac{2(-bc+ad)g^4(a+bx)^3}{c+dx}dx}{4bg}$$
$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4b} + \frac{\left(B(bc-ad)g^3\right)\int\frac{(a+bx)^3}{c+dx}dx}{2b}$$
$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4b} + \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2}{d^3} - \frac{b(bc-ad)(}{d^2}\right.}{2b}$$
$$= \frac{B(bc-ad)^3g^3x}{2d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2}{4bd^2} + \frac{B(bc-ad)g^3(a+bx)^3}{6bd} - \frac{B(bc}{}$$

Mathematica [A] time = 0.07413, size = 122, normalized size = 0.81

$$\frac{g^3\left((a+bx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+\frac{B(bc-ad)\left(3d^2(a+bx)^2(ad-bc)+6bdx(bc-ad)^2-6(bc-ad)^3\log(c+dx)+2d^3(a+bx)^3\right)}{3d^4}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g^3*((B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x
)^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]))/(3*d^4) + (a + b*x
)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])))/(4*b)
```

Maple [B] time = 0.243, size = 788, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] 1/4*A*g^3*x^4*b^3+A*g^3*x*a^3-3/2*B*x*a^3*g^3+1/2*b^3*g^3*B*c^4/d^4*ln(1/(b
*x+a))+b^2*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x^3*a*g^3-2*g^3*B*a^
3/d*ln(1/(b*x+a))*c+2*g^3*B*a^3/d*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c-1/2*b^3
*g^3*B*c^4/d^4*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)+3/2*b*B*ln(e*(1/(b*x+a)*a*d-
b*c/(b*x+a)-d)^2/b^2)*x^2*a^2*g^3+1/4/b*A*a^4*g^3-11/12/b*B*a^4*g^3+1/2/d^3
*B*g^3*b^2*a*c^3+A*g^3*x^3*a*b^2-3/4*B*g^3*b*a^2*x^2+13/6/d*B*a^3*c*g^3+3/2
*A*g^3*x^2*a^2*b-3*b*g^3*B*a^2/d^2*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c^2+2*b^
2*g^3*B*a/d^3*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c^3+3*b*g^3*B*a^2/d^2*ln(1/(b
*x+a))*c^2-7/4/d^2*B*g^3*b*a^2*c^2-1/6*B*g^3*b^2*a*x^3+B*ln(e*(1/(b*x+a)*a*
d-b*c/(b*x+a)-d)^2/b^2)*x*a^3*g^3+1/4/b*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d
)^2/b^2)*a^4*g^3-1/2/b*g^3*B*a^4*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)+1/2/b*g^3*
B*a^4*ln(1/(b*x+a))+1/4*b^3*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x^4
*g^3+1/6/d*B*g^3*b^3*c*x^3-1/4/d^2*B*g^3*b^3*c^2*x^2+1/2/d^3*B*g^3*b^3*c^3*
x-2*b^2*g^3*B*a/d^3*ln(1/(b*x+a))*c^3+1/d*B*g^3*b^2*a*x^2*c-2/d^2*B*g^3*b^2
*a*x*c^2+3/d*B*g^3*a^2*b*c*x
```

Maxima [B] time = 1.37302, size = 871, normalized size = 5.77

$$\frac{1}{4}Ab^3g^3x^4 + Aab^2g^3x^3 + \frac{3}{2}Aa^2bg^3x^2 + \left(x\log\left(\frac{d^2ex^2}{b^2x^2+2abx+a^2} + \frac{2cdex}{b^2x^2+2abx+a^2} + \frac{c^2e}{b^2x^2+2abx+a^2}\right) - \frac{2a\log(b}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/4*A*b^3*g^3*x^4 + A*a*b^2*g^3*x^3 + 3/2*A*a^2*b*g^3*x^2 + (x*log(d^2*e*x^
2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(
b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d)*B*a^3*
g^3 + 3/2*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2
 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*x + a)/b
^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*B*a^2*b*g^3 + (x^3*log
(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2)
+ c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x
 + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*
B*a*b^2*g^3 + 1/12*(3*x^4*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e
*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 6*a^4*log
```

```
(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3
*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*b^3*g^
3 + A*a^3*g^3*x
```

Fricas [B] time = 1.18112, size = 709, normalized size = 4.7

$$\frac{3\,Ab^4d^4g^3x^4 - 6\,Ba^4d^4g^3\log(bx+a) + 2\left(Bb^4cd^3 + (6\,A-B)ab^3d^4\right)g^3x^3 - 3\left(Bb^4c^2d^2 - 4\,Bab^3cd^3 - 3\,(2\,A-B)a^2b^2d^4\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] 1/12*(3*A*b^4*d^4*g^3*x^4 - 6*B*a^4*d^4*g^3*log(b*x + a) + 2*(B*b^4*c*d^3 +
 (6*A - B)*a*b^3*d^4)*g^3*x^3 - 3*(B*b^4*c^2*d^2 - 4*B*a*b^3*c*d^3 - 3*(2*A
 - B)*a^2*b^2*d^4)*g^3*x^2 + 6*(B*b^4*c^3*d - 4*B*a*b^3*c^2*d^2 + 6*B*a^2*b
^2*c*d^3 + (2*A - 3*B)*a^3*b*d^4)*g^3*x - 6*(B*b^4*c^4 - 4*B*a*b^3*c^3*d +
6*B*a^2*b^2*c^2*d^2 - 4*B*a^3*b*c*d^3)*g^3*log(d*x + c) + 3*(B*b^4*d^4*g^3*
x^4 + 4*B*a*b^3*d^4*g^3*x^3 + 6*B*a^2*b^2*d^4*g^3*x^2 + 4*B*a^3*b*d^4*g^3*x
)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/(b*d^4)
```

Sympy [B] time = 6.02591, size = 722, normalized size = 4.78

$$\frac{Ab^3g^3x^4}{4} - \frac{Ba^4g^3\log\left(x + \frac{\frac{Ba^5d^4g^3}{b} + 4Ba^4cd^3g^3 - 6Ba^3bc^2d^2g^3 + 4Ba^2b^2c^3dg^3 - Bab^3c^4g^3}{Ba^4d^4g^3 + 4Ba^3bcd^3g^3 - 6Ba^2b^2c^2d^2g^3 + 4Bab^3c^3dg^3 - Bb^4c^4g^3}\right)}{2b} + \frac{Bcg^3\,(2ad-bc)\left(2a^2d^2 - 2abcd + b^2c^2\right)\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b**3*g**3*x**4/4 - B*a**4*g**3*log(x + (B*a**5*d**4*g**3/b + 4*B*a**4*c*d
**3*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3
*c**4*g**3)/(B*a**4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2
*d**2*g**3 + 4*B*a*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*b) + B*c*g**3*(
2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)*log(x + (5*B*a**4*c*d**3
*g**3 - 6*B*a**3*b*c**2*d**2*g**3 + 4*B*a**2*b**2*c**3*d*g**3 - B*a*b**3*c*
```

```
*4*g**3 - B*a*c*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2) +
B*b*c**2*g**3*(2*a*d - b*c)*(2*a**2*d**2 - 2*a*b*c*d + b**2*c**2)/d)/(B*a**
4*d**4*g**3 + 4*B*a**3*b*c*d**3*g**3 - 6*B*a**2*b**2*c**2*d**2*g**3 + 4*B*a
*b**3*c**3*d*g**3 - B*b**4*c**4*g**3))/(2*d**4) + (B*a**3*g**3*x + 3*B*a**2
*b*g**3*x**2/2 + B*a*b**2*g**3*x**3 + B*b**3*g**3*x**4/4)*log(e*(c + d*x)**
2/(a + b*x)**2) + x**3*(6*A*a*b**2*d*g**3 - B*a*b**2*d*g**3 + B*b**3*c*g**3
)/(6*d) + x**2*(6*A*a**2*b*d**2*g**3 - 3*B*a**2*b*d**2*g**3 + 4*B*a*b**2*c*
d*g**3 - B*b**3*c**2*g**3)/(4*d**2) + x*(2*A*a**3*d**3*g**3 - 3*B*a**3*d**3
*g**3 + 6*B*a**2*b*c*d**2*g**3 - 4*B*a*b**2*c**2*d*g**3 + B*b**3*c**3*g**3)
/(2*d**3)
```

Giac [B] time = 26.1149, size = 491, normalized size = 3.25

$$-\frac{Ba^4g^3\log(bx+a)}{2\,b}+\frac{1}{4}\left(Ab^3g^3+Bb^3g^3\right)x^4+\frac{\left(Bb^3cg^3+6\,Aab^2dg^3+5\,Bab^2dg^3\right)x^3}{6\,d}+\frac{1}{4}\left(Bb^3g^3x^4+4\,Bab^2g^3x^3+6\,Ba^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] -1/2*B*a^4*g^3*log(b*x + a)/b + 1/4*(A*b^3*g^3 + B*b^3*g^3)*x^4 + 1/6*(B*b^
3*c*g^3 + 6*A*a*b^2*d*g^3 + 5*B*a*b^2*d*g^3)*x^3/d + 1/4*(B*b^3*g^3*x^4 + 4
*B*a*b^2*g^3*x^3 + 6*B*a^2*b*g^3*x^2 + 4*B*a^3*g^3*x)*log((d^2*x^2 + 2*c*d*
x + c^2)/(b^2*x^2 + 2*a*b*x + a^2)) - 1/4*(B*b^3*c^2*g^3 - 4*B*a*b^2*c*d*g^
3 - 6*A*a^2*b*d^2*g^3 - 3*B*a^2*b*d^2*g^3)*x^2/d^2 + 1/2*(B*b^3*c^3*g^3 - 4
*B*a*b^2*c^2*d*g^3 + 6*B*a^2*b*c*d^2*g^3 + 2*A*a^3*d^3*g^3 - B*a^3*d^3*g^3)
*x/d^3 - 1/2*(B*b^3*c^4*g^3 - 4*B*a*b^2*c^3*d*g^3 + 6*B*a^2*b*c^2*d^2*g^3 -
 4*B*a^3*c*d^3*g^3)*log(-d*x - c)/d^4
```

3.203 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right) dx$

Optimal. Leaf size=120

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3b}-\frac{2Bg^2x(bc-ad)^2}{3d^2}+\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

```
[Out] (-2*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2)/(3*b*d
) + (2*B*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3) + (g^2*(a + b*x)^3*(A +
B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b)
```

Rubi [A] time = 0.0783567, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 43}

$$\frac{g^2(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3b}-\frac{2Bg^2x(bc-ad)^2}{3d^2}+\frac{2Bg^2(bc-ad)^3\log(c+dx)}{3bd^3}+\frac{Bg^2(a+bx)^2(bc-ad)}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (-2*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (B*(b*c - a*d)*g^2*(a + b*x)^2)/(3*b*d
) + (2*B*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b*d^3) + (g^2*(a + b*x)^3*(A +
B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b} - \frac{B\int \frac{2(-bc+ad)g^3(a+bx)^2}{c+dx}\,dx}{3bg}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b} + \frac{\left(2B(bc-ad)g^2\right)\int \frac{(a+bx)^2}{c+dx}\,dx}{3b}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b} + \frac{\left(2B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)}{d^2}+\frac{b(a+bx)}{d}\right.}{3b}$$

$$= -\frac{2B(bc-ad)^2g^2x}{3d^2} + \frac{B(bc-ad)g^2(a+bx)^2}{3bd} + \frac{2B(bc-ad)^3g^2\log(c+dx)}{3bd^3} +$$

Mathematica [A] time = 0.050639, size = 98, normalized size = 0.82

$$\frac{g^2\left(\frac{B(bc-ad)\left(d\left(a^2d+4abdx+b^2x(dx-2c)\right)+2(bc-ad)^2\log(c+dx)\right)}{d^3}+(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)\right)}{3b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g^2*((B*(b*c - a*d)*(d*(a^2*d + 4*a*b*d*x + b^2*x*(-2*c + d*x)) + 2*(b*c -
 a*d)^2*Log[c + d*x]))/d^3 + (a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*
x)^2])))/(3*b)
```

Maple [B] time = 0.241, size = 569, normalized size = 4.7

$$\frac{5\,g^2Ba^2c}{3\,d}+2\,\frac{g^2Ba^2c}{d}\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)+\frac{b^2g^2Bcx^2}{3\,d}-\frac{2\,b^2g^2Bc^2x}{3\,d^2}-\frac{2\,bg^2Bac^2}{3\,d^2}-\frac{2\,g^2Ba^3}{3\,b}\ln\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] 5/3*g^2*B*a^2/d*c+2*g^2*B*a^2/d*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c+1/3*b^2*g
^2*B*c/d*x^2-2/3*b^2*g^2*B*c^2/d^2*x-2/3*b*g^2*B*a/d^2*c^2-2/3/b*g^2*B*a^3*
ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)+1/3*b^2*A*x^3*g^2+1/3*b^2*B*ln(e*(1/(b*x+a)
*a*d-b*c/(b*x+a)-d)^2/b^2)*x^3*g^2+b*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2
/b^2)*x^2*a*g^2+B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x*a^2*g^2+1/3/b
*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*a^3*g^2+2/3/b*g^2*B*a^3*ln(1/(
b*x+a))+2/3*b^2*g^2*B*c^3/d^3*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)-2/3*b^2*g^2*B
*c^3/d^3*ln(1/(b*x+a))-2*b*g^2*B*a/d^2*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*c^2+
2*b*g^2*B*a/d^2*ln(1/(b*x+a))*c^2-2*g^2*B*a^2/d*ln(1/(b*x+a))*c+2*b*g^2*B*a
/d*c*x-4/3*B*x*a^2*g^2-1/3*b*B*x^2*a*g^2+b*A*x^2*a*g^2+A*x*a^2*g^2+1/3/b*A*
a^3*g^2-1/b*g^2*B*a^3
```

Maxima [B] time = 1.33054, size = 589, normalized size = 4.91

$$\frac{1}{3}Ab^2g^2x^3 + Aabg^2x^2 + \left(x\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2} + \frac{2\,cdex}{b^2x^2+2\,abx+a^2} + \frac{c^2e}{b^2x^2+2\,abx+a^2}\right) - \frac{2\,a\log(bx+a)}{b} + \frac{2\,c\log\ldots}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] 1/3*A*b^2*g^2*x^3 + A*a*b*g^2*x^2 + (x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a
^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)
) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d)*B*a^2*g^2 + (x^2*log(d^2*e*x^2
/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b
^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2
+ 2*(b*c - a*d)*x/(b*d))*B*a*b*g^2 + 1/3*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*
b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x
 + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*
b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*b^2*g^2 + A*a^2*g^2*x
```

Fricas [B] time = 1.11278, size = 508, normalized size = 4.23

$$\frac{Ab^3d^3g^2x^3 - 2\,Ba^3d^3g^2\log(bx+a) + \left(Bb^3cd^2 + (3\,A-B)ab^2d^3\right)g^2x^2 - \left(2\,Bb^3c^2d - 6\,Bab^2cd^2 - (3\,A-4\,B)a^2bd^3\right)g^2x \ldots}{3\,b\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] 1/3*(A*b^3*d^3*g^2*x^3 - 2*B*a^3*d^3*g^2*log(b*x + a) + (B*b^3*c*d^2 + (3*A
 - B)*a*b^2*d^3)*g^2*x^2 - (2*B*b^3*c^2*d - 6*B*a*b^2*c*d^2 - (3*A - 4*B)*a
^2*b*d^3)*g^2*x + 2*(B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*g^2*log
(d*x + c) + (B*b^3*d^3*g^2*x^3 + 3*B*a*b^2*d^3*g^2*x^2 + 3*B*a^2*b*d^3*g^2*
x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/(b*d^3)
```

Sympy [B] time = 4.15602, size = 527, normalized size = 4.39

$$\frac{Ab^2g^2x^3}{3} - \frac{2Ba^3g^2\log\left(x + \frac{\frac{2Ba^4d^3g^2}{b} + 6Ba^3cd^2g^2 - 6Ba^2bc^2dg^2 + 2Bab^2c^3g^2}{2Ba^3d^3g^2 + 6Ba^2bcd^2g^2 - 6Bab^2c^2dg^2 + 2Bb^3c^3g^2}\right)}{3b} + \frac{2Bcg^2\left(3a^2d^2 - 3abcd + b^2c^2\right)\log\left(x + \frac{8Ba^3cd^2g^2 - 6Ba^2b\cdots}{\cdots}\right)}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b**2*g**2*x**3/3 - 2*B*a**3*g**2*log(x + (2*B*a**4*d**3*g**2/b + 6*B*a**3
*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2)/(2*B*a**3*d**
3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g*
*2))/(3*b) + 2*B*c*g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2)*log(x + (8*B*
a**3*c*d**2*g**2 - 6*B*a**2*b*c**2*d*g**2 + 2*B*a*b**2*c**3*g**2 - 2*B*a*c*
g**2*(3*a**2*d**2 - 3*a*b*c*d + b**2*c**2) + 2*B*b*c**2*g**2*(3*a**2*d**2 -
 3*a*b*c*d + b**2*c**2)/d)/(2*B*a**3*d**3*g**2 + 6*B*a**2*b*c*d**2*g**2 - 6
*B*a*b**2*c**2*d*g**2 + 2*B*b**3*c**3*g**2))/(3*d**3) + (B*a**2*g**2*x + B*
a*b*g**2*x**2 + B*b**2*g**2*x**3/3)*log(e*(c + d*x)**2/(a + b*x)**2) + x**2
*(3*A*a*b*d*g**2 - B*a*b*d*g**2 + B*b**2*c*g**2)/(3*d) + x*(3*A*a**2*d**2*g
**2 - 4*B*a**2*d**2*g**2 + 6*B*a*b*c*d*g**2 - 2*B*b**2*c**2*g**2)/(3*d**2)
```

Giac [B] time = 4.72178, size = 335, normalized size = 2.79

$$-\frac{2\,Ba^3g^2\log\left(bx + a\right)}{3\,b} + \frac{1}{3}\left(Ab^2g^2 + Bb^2g^2\right)x^3 + \frac{\left(Bb^2cg^2 + 3\,Aabdg^2 + 2\,Babdg^2\right)x^2}{3\,d} + \frac{1}{3}\left(Bb^2g^2x^3 + 3\,Babg^2x^2 + 3\,Ba^2g\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] -2/3*B*a^3*g^2*log(b*x + a)/b + 1/3*(A*b^2*g^2 + B*b^2*g^2)*x^3 + 1/3*(B*b^
2*c*g^2 + 3*A*a*b*d*g^2 + 2*B*a*b*d*g^2)*x^2/d + 1/3*(B*b^2*g^2*x^3 + 3*B*a
*b*g^2*x^2 + 3*B*a^2*g^2*x)*log((d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*
x + a^2)) - 1/3*(2*B*b^2*c^2*g^2 - 6*B*a*b*c*d*g^2 - 3*A*a^2*d^2*g^2 + B*a^
2*d^2*g^2)*x/d^2 + 2/3*(B*b^2*c^3*g^2 - 3*B*a*b*c^2*d*g^2 + 3*B*a^2*c*d^2*g
^2)*log(d*x + c)/d^3
```

3.204 $\int(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\,dx$

Optimal. Leaf size=78

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}+\frac{Bgx(bc-ad)}{d}$$

```
[Out] (B*(b*c - a*d)*g*x)/d - (B*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) + (g*(a +
b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(2*b)
```

Rubi [A] time = 0.0523818, antiderivative size = 78, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2525, 12, 43}

$$\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{2b}-\frac{Bg(bc-ad)^2\log(c+dx)}{bd^2}+\frac{Bgx(bc-ad)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (B*(b*c - a*d)*g*x)/d - (B*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) + (g*(a +
b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(2*b)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)dx &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b}-\frac{B\int\frac{2(bc-ad)g^2(-a-bx)}{c+dx}\,dx}{2bg}\\ &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b}-\frac{(B(bc-ad)g)\int\frac{-a-bx}{c+dx}\,dx}{b}\\ &= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b}-\frac{(B(bc-ad)g)\int\left(-\frac{b}{d}+\frac{bc-ad}{d(c+dx)}\right)dx}{b}\\ &= \frac{B(bc-ad)gx}{d}-\frac{B(bc-ad)^2g\log(c+dx)}{bd^2}+\frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right.\right.}{2b}\end{aligned}$$

Mathematica [A] time = 0.037048, size = 72, normalized size = 0.92

$$\frac{g\left((a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)-\frac{2B(ad-bc)((ad-bc)\log(c+dx)+bdx)}{d^2}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] (g*((-2*B*(-(b*c) + a*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]))/d^2 + (a +
b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])))/(2*b)
```

Maple [B] time = 0.242, size = 340, normalized size = 4.4

$$\frac{bAx^2g}{2}+Axag+\frac{Aa^2g}{2b}+\frac{bBx^2g}{2}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)+B\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)xag+\frac{gBa^2}{2b}\ln\left(\frac{e}{b}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] 1/2*b*A*x^2*g+A*x*a*g+1/2/b*A*a^2*g+1/2*b*B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)
-d)^2/b^2)*x^2*g+B*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*x*a*g+1/2/b*B*
ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)*a^2*g+1/b*g*B*ln(1/(b*x+a))*a^2-2
*g*B/d*ln(1/(b*x+a))*a*c+b*g*B/d^2*ln(1/(b*x+a))*c^2-B*x*a*g-1/b*g*B*a^2+b*
g*B/d*c*x+g*B/d*a*c-1/b*g*B*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*a^2+2*g*B/d*ln(
1/(b*x+a)*a*d-b*c/(b*x+a)-d)*a*c-b*g*B/d^2*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*
c^2
```

Maxima [B] time = 1.24947, size = 338, normalized size = 4.33

$$\frac{1}{2}\,Abgx^2+\left(x\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx+a^2}\right)-\frac{2\,a\log\left(bx+a\right)}{b}+\frac{2\,c\log\left(dx+c\right)}{d}\right)Bag$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxima
")
```

```
[Out] 1/2*A*b*g*x^2 + (x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2
*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)
/b + 2*c*log(d*x + c)/d)*B*a*g + 1/2*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x
+ a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a
^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b
*d))*B*b*g + A*a*g*x
```

Fricas [A] time = 1.10473, size = 329, normalized size = 4.22

$$\frac{Ab^2d^2gx^2-2\,Ba^2d^2g\log\left(bx+a\right)+2\left(Bb^2cd+(A-B)abd^2\right)gx-2\left(Bb^2c^2-2\,Babcd\right)g\log\left(dx+c\right)+\left(Bb^2d^2gx^2+2\,Bab\right.}{2\,bd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fricas
")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 - 2*B*a^2*d^2*g*log(b*x + a) + 2*(B*b^2*c*d + (A - B)*
a*b*d^2)*g*x - 2*(B*b^2*c^2 - 2*B*a*b*c*d)*g*log(d*x + c) + (B*b^2*d^2*g*x^
```

```
2 + 2*B*a*b*d^2*g*x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x
 + a^2)))/(b*d^2)
```

Sympy [B] time = 2.54484, size = 253, normalized size = 3.24

$$\frac{Abgx^2}{2} - \frac{Ba^2g\log\left(x + \frac{\frac{Ba^3d^2g}{b} + 2Ba^2cdg - Babc^2g}{Ba^2d^2g + 2Babcdg - Bb^2c^2g}\right)}{b} + \frac{Bcg\left(2ad - bc\right)\log\left(x + \frac{3Ba^2cdg - Babc^2g - Bacg(2ad - bc) + \frac{Bbc^2g(2ad-bc)}{d}}{Ba^2d^2g + 2Babcdg - Bb^2c^2g}\right)}{d^2} + \left(Bagx +\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] A*b*g*x**2/2 - B*a**2*g*log(x + (B*a**3*d**2*g/b + 2*B*a**2*c*d*g - B*a*b*c
**2*g)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/b + B*c*g*(2*a*d -
b*c)*log(x + (3*B*a**2*c*d*g - B*a*b*c**2*g - B*a*c*g*(2*a*d - b*c) + B*b*c
**2*g*(2*a*d - b*c)/d)/(B*a**2*d**2*g + 2*B*a*b*c*d*g - B*b**2*c**2*g))/d**
2 + (B*a*g*x + B*b*g*x**2/2)*log(e*(c + d*x)**2/(a + b*x)**2) + x*(A*a*d*g
- B*a*d*g + B*b*c*g)/d
```

Giac [A] time = 1.74365, size = 173, normalized size = 2.22

$$-\frac{Ba^2g\log\left(bx + a\right)}{b} + \frac{1}{2}\left(Abg + Bbg\right)x^2 + \frac{1}{2}\left(Bbgx^2 + 2\,Bagx\right)\log\left(\frac{d^2x^2 + 2\,cdx + c^2}{b^2x^2 + 2\,abx + a^2}\right) + \frac{\left(Bbcg + Aadg\right)x}{d} - \frac{\left(Bbc^2g - 2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac")
```

```
[Out] -B*a^2*g*log(b*x + a)/b + 1/2*(A*b*g + B*b*g)*x^2 + 1/2*(B*b*g*x^2 + 2*B*a*
g*x)*log((d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*x + a^2)) + (B*b*c*g +
A*a*d*g)*x/d - (B*b*c^2*g - 2*B*a*c*d*g)*log(-d*x - c)/d^2
```

3.205 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{ag+bgx}\,dx$

Optimal. Leaf size=83

$$-\frac{2B\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(b*g)) - (2*B*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b*g)
```

Rubi [A] time = 0.291895, antiderivative size = 121, normalized size of antiderivative = 1.46, number of steps used = 10, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {2524, 12, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{\log(ag+bgx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg}-\frac{2B\log(ag+bgx)\log\left(\frac{b(c+dx)}{bc-ad}\right)}{bg}+\frac{B\log^2(g(a+bx))}{bg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x),x]
```

```
[Out] (B*Log[g*(a + b*x)]^2)/(b*g) - (2*B*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g
+ b*g*x])/(b*g) + ((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])*Log[a*g + b*g*x
])/(b*g) - (2*B*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(a+bx)^2\left(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\right)\log(ag+bgx)}{e(c+dx)^2}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \frac{(a+bx)^2\left(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\right)\log(ag+bgx)}{(c+dx)^2}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} - \frac{B\int \left(-\frac{2be\log(ag+bgx)}{a+bx}+\frac{2de\log(ag+bgx)}{c+dx}\right)dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{(2B)\int \frac{\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{(2Bd)\int \frac{\log(ag+bgx)}{c+dx}\,dx}{bg}$$

$$= -\frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} + (2B)\int \frac{\log\left(\frac{bg(c+d}{bcg-a}\right.}{ag+bg}$$

$$= -\frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} + \frac{(2B)\,\text{Subst}\left(\int \frac{\log}{x}\right.}{b}$$

$$= \frac{B\log^2(g(a+bx))}{bg} - \frac{2B\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{bg} -$$

Mathematica [A] time = 0.0366503, size = 87, normalized size = 1.05

$$\frac{\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)-2B\log\left(\frac{b(c+dx)}{bc-ad}\right)+B\log(a+bx)+A\right)-2B\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)}{bg}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x),x]
```

```
[Out] (Log[a + b*x]*(A + B*Log[a + b*x] - 2*B*Log[(b*(c + d*x))/(b*c - a*d)] + B*
Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 2*B*PolyLog[2, (d*(a + b*x))/(-(b*c) +
a*d)])/(b*g)
```

Maple [B] time = 0.335, size = 265, normalized size = 3.2

$$-\frac{A\ln\left((bx+a)^{-1}\right)}{bg}-\frac{B\ln\left((bx+a)^{-1}\right)}{bg}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)+2\frac{Bad}{bg\left(ad-bc\right)}\mathrm{dilog}\left(-\frac{1}{d}\left(\frac{ad-bc}{bx+a}-d\right)\right)-2\frac{}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x)
```

```
[Out] -1/b/g*A*ln(1/(b*x+a))-1/b/g*B*ln(1/(b*x+a))*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a
)-d)^2/b^2)+2/b/g*B*dilog(-(1/(b*x+a)*(a*d-b*c)-d)/d)/(a*d-b*c)*a*d-2/g*B*d
ilog(-(1/(b*x+a)*(a*d-b*c)-d)/d)/(a*d-b*c)*c+2/b/g*B*ln(1/(b*x+a))*ln(-(1/(
b*x+a)*(a*d-b*c)-d)/d)/(a*d-b*c)*a*d-2/g*B*ln(1/(b*x+a))*ln(-(1/(b*x+a)*(a*
d-b*c)-d)/d)/(a*d-b*c)*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$B\left(\frac{2\log\left(bx+a\right)\log\left(dx+c\right)}{bg}-\int-\frac{bdx\log\left(e\right)+bc\log\left(e\right)-2\left(2\,bdx+bc+ad\right)\log\left(bx+a\right)}{b^2dgx^2+abcg+\left(b^2cg+abdg\right)x}\,dx\right)+\frac{A\log\left(bgx+ag\right)}{bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x, algorithm="maxima
")
```

```
[Out] B*(2*log(b*x + a)*log(d*x + c)/(b*g) - integrate(-(b*d*x*log(e) + b*c*log(e
) - 2*(2*b*d*x + b*c + a*d)*log(b*x + a))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g
 + a*b*d*g)*x), x)) + A*log(b*g*x + a*g)/(b*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x, algorithm="fricas
")
```

```
[Out] integral((B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))
+ A)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B \log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A}{bgx + ag} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g),x, algorithm="giac")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)/(b*g*x + a*g), x)
```

3.206 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=102

$$-\frac{A(c+dx)}{g^2(a+bx)(bc-ad)}-\frac{B(c+dx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{g^2(a+bx)(bc-ad)}+\frac{2B(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] -((A*(c + d*x))/((b*c - a*d)*g^2*(a + b*x))) + (2*B*(c + d*x))/((b*c - a*d)
*g^2*(a + b*x)) - (B*(c + d*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/((b*c - a*
d)*g^2*(a + b*x))
```

Rubi [A] time = 0.07582, antiderivative size = 105, normalized size of antiderivative = 1.03, number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{bg^2(a+bx)}+\frac{2Bd\log(a+bx)}{bg^2(bc-ad)}-\frac{2Bd\log(c+dx)}{bg^2(bc-ad)}+\frac{2B}{bg^2(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] (2*B)/(b*g^2*(a + b*x)) + (2*B*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) - (2*B*d
*Log[c + d*x])/(b*(b*c - a*d)*g^2) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
])/(b*g^2*(a + b*x))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^2}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)} + \frac{B\int\frac{2(-bc+ad)}{g(a+bx)^2(c+dx)}\,dx}{bg} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)} - \frac{(2B(bc-ad))\int\frac{1}{(a+bx)^2(c+dx)}\,dx}{bg^2} \\
&= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)} - \frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^2}-\frac{bd}{(bc-ad)^2(a+bx)}+\frac{d^2}{(bc-ad)^2(c+dx)}\right)dx}{bg^2} \\
&= \frac{2B}{bg^2(a+bx)} + \frac{2Bd\log(a+bx)}{b(bc-ad)g^2} - \frac{2Bd\log(c+dx)}{b(bc-ad)g^2} - \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bg^2(a+bx)}
\end{aligned}$$

Mathematica [A] time = 0.0515359, size = 89, normalized size = 0.87

$$\frac{-(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A-2B\right)-2Bd(a+bx)\log(c+dx)+2Bd(a+bx)\log(a+bx)}{bg^2(a+bx)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^2,x]
```

```
[Out] (2*B*d*(a + b*x)*Log[a + b*x] - 2*B*d*(a + b*x)*Log[c + d*x] - (b*c - a*d)*
(A - 2*B + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^2*(a + b*x
))
```

Maple [B] time = 0.062, size = 212, normalized size = 2.1

$$-\frac{A}{bg^2(bx+a)} - \frac{B}{bg^2(bx+a)}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right) + 2\frac{Bad}{bg^2(ad-bc)(bx+a)} - 2\frac{Bc}{g^2(ad-bc)(bx+a)} + 2\frac{}{bg^2(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x)
```

```
[Out] -1/b/g^2*A/(b*x+a)-1/b/g^2*B/(b*x+a)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b
^2)+2/b/g^2*B/(a*d-b*c)/(b*x+a)*a*d-2/g^2*B/(a*d-b*c)/(b*x+a)*c+2/b/g^2*B*d
^2/(a*d-b*c)^2*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*a-2/g^2*B*d/(a*d-b*c)^2*ln(1
/(b*x+a)*a*d-b*c/(b*x+a)-d)*c
```

Maxima [A] time = 1.23322, size = 252, normalized size = 2.47

$$-B\left(\frac{\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx+a^2}\right)}{b^2g^2x+abg^2}-\frac{2}{b^2g^2x+abg^2}-\frac{2\,d\log\left(bx+a\right)}{\left(b^2c-abd\right)g^2}+\frac{2\,d\log\left(dx+c\right)}{\left(b^2c-abd\right)g^2}\right)-\frac{A}{b^2g^2x+ab$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x, algorithm="maxi
ma")
```

```
[Out] -B*(log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x
+ a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^2*g^2*x + a*b*g^2) - 2/(b^2*g^
2*x + a*b*g^2) - 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + 2*d*log(d*x + c)/
((b^2*c - a*b*d)*g^2)) - A/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.0378, size = 228, normalized size = 2.24

$$-\frac{(A-2\,B)bc-(A-2\,B)ad+(Bbdx+Bbc)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)}{\left(b^3c-ab^2d\right)g^2x+\left(ab^2c-a^2bd\right)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x, algorithm="fric
as")
```

```
[Out] -((A - 2*B)*b*c - (A - 2*B)*a*d + (B*b*d*x + B*b*c)*log((d^2*e*x^2 + 2*c*d*
e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*
```

```
c - a^2*b*d)*g^2)
```

Sympy [B] time = 1.93865, size = 253, normalized size = 2.48

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{abg^2+b^2g^2x}+\frac{2Bd\log\left(x+\frac{-\frac{2Ba^2d^3}{ad-bc}+\frac{4Babcd^2}{ad-bc}+2Bad^2-\frac{2Bb^2c^2d}{ad-bc}+2Bbcd}{4Bbd^2}\right)}{bg^2(ad-bc)}-\frac{2Bd\log\left(x+\frac{\frac{2Ba^2d^3}{ad-bc}-\frac{4Babcd^2}{ad-bc}+2Bad^2+\frac{2Bb^2c^2d}{ad-bc}+2Bbcd}{4Bbd^2}\right)}{bg^2(ad-bc)}-\frac{}{ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**2,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(a*b*g**2 + b**2*g**2*x) + 2*B*d*log(x
+ (-2*B*a**2*d**3/(a*d - b*c) + 4*B*a*b*c*d**2/(a*d - b*c) + 2*B*a*d**2 - 2
*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*(a*d - b*c))
- 2*B*d*log(x + (2*B*a**2*d**3/(a*d - b*c) - 4*B*a*b*c*d**2/(a*d - b*c) + 2
*B*a*d**2 + 2*B*b**2*c**2*d/(a*d - b*c) + 2*B*b*c*d)/(4*B*b*d**2))/(b*g**2*
(a*d - b*c)) - (A - 2*B)/(a*b*g**2 + b**2*g**2*x)
```

Giac [A] time = 1.38116, size = 254, normalized size = 2.49

$$-\left(2\left(b^2cg^2-abdg^2\right)\left(\frac{d\log\left(\left|\frac{bcg}{bgx+ag}-\frac{adg}{bgx+ag}+d\right|\right)}{b^4c^2g^4-2\,ab^3cdg^4+a^2b^2d^2g^4}-\frac{1}{\left(b^2cg^2-abdg^2\right)\left(bgx+ag\right)bg}\right)+\frac{\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)}{\left(bgx+ag\right)bg}\right)B-\frac{A}{\left(bgx+ag\right)bg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^2,x, algorithm="giac
")
```

```
[Out] -(2*(b^2*c*g^2 - a*b*d*g^2)*(d*log(abs(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x +
 a*g) + d))/(b^4*c^2*g^4 - 2*a*b^3*c*d*g^4 + a^2*b^2*d^2*g^4) - 1/((b^2*c*g
^2 - a*b*d*g^2)*(b*g*x + a*g)*b*g)) + log((d*x + c)^2*e/(b*x + a)^2)/((b*g*
x + a*g)*b*g))*B - A/((b*g*x + a*g)*b*g)
```

3.207 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=139

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}-\frac{Bd}{bg^3(a+bx)(bc-ad)}+\frac{B}{2bg^3(a+bx)^2}$$

```
[Out] B/(2*b*g^3*(a + b*x)^2) - (B*d)/(b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Log[
a + b*x])/(b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3
) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*b*g^3*(a + b*x)^2)
```

Rubi [A] time = 0.100561, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{2bg^3(a+bx)^2}-\frac{Bd^2\log(a+bx)}{bg^3(bc-ad)^2}+\frac{Bd^2\log(c+dx)}{bg^3(bc-ad)^2}-\frac{Bd}{bg^3(a+bx)(bc-ad)}+\frac{B}{2bg^3(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] B/(2*b*g^3*(a + b*x)^2) - (B*d)/(b*(b*c - a*d)*g^3*(a + b*x)) - (B*d^2*Log[
a + b*x])/(b*(b*c - a*d)^2*g^3) + (B*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3
) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*b*g^3*(a + b*x)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^3}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2bg^3(a+bx)^2}+\frac{B\int\frac{2(-bc+ad)}{g^2(a+bx)^3(c+dx)}\,dx}{2bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2bg^3(a+bx)^2}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^3}-\frac{bd}{(bc-ad)^2(a+bx)^2}+\frac{bd^2}{(bc-ad)^3(a+bx)}-\frac{d^3}{(bc-ad)^3}\right.}{bg^3}$$

$$= \frac{B}{2bg^3(a+bx)^2}-\frac{Bd}{b(bc-ad)g^3(a+bx)}-\frac{Bd^2\log(a+bx)}{b(bc-ad)^2g^3}+\frac{Bd^2\log(c+dx)}{b(bc-ad)^2g^3}-\frac{A+B\log\left(\frac{e(c}{(a}\right.}{2bg^3(a+b}$$

Mathematica [A] time = 0.0962121, size = 128, normalized size = 0.92

$$-\frac{(bc-ad)\left(-aAd+B(bc-ad)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+3aBd+Abc-bBc+2bBdx\right)-2Bd^2(a+bx)^2\log(c+dx)+2Bd^2(a+bx)^2}{2bg^3(a+bx)^2(bc-ad)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^3,x]
```

```
[Out] -(2*B*d^2*(a + b*x)^2*Log[a + b*x] - 2*B*d^2*(a + b*x)^2*Log[c + d*x] + (b*
c - a*d)*(A*b*c - b*B*c - a*A*d + 3*a*B*d + 2*b*B*d*x + B*(b*c - a*d)*Log[(
e*(c + d*x)^2)/(a + b*x)^2]))/(2*b*(b*c - a*d)^2*g^3*(a + b*x)^2)
```

Maple [B] time = 0.06, size = 300, normalized size = 2.2

$$-\frac{A}{2\,b\,(bx+a)^2\,g^3}-\frac{B}{2\,b\,(bx+a)^2\,g^3}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)+\frac{Ba^2d^2}{2\,bg^3\,(ad-bc)^2\,(bx+a)^2}-\frac{Badc}{g^3\,(ad-bc)^2\,(bx+a)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2/b/(b*x+a)^2/g^3*A-1/2/b/g^3*B/(b*x+a)^2*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a
)-d)^2/b^2)+1/2/b/g^3*B/(a*d-b*c)^2/(b*x+a)^2*a^2*d^2-1/g^3*B/(a*d-b*c)^2/(
b*x+a)^2*a*d*c+1/2*b/g^3*B/(a*d-b*c)^2*c^2/(b*x+a)^2+1/b/g^3*B/(a*d-b*c)^2*
d^2/(b*x+a)*a-1/g^3*B/(a*d-b*c)^2*d/(b*x+a)*c+1/b/g^3*B*d^3/(a*d-b*c)^3*ln(
1/(b*x+a)*a*d-b*c/(b*x+a)-d)*a-1/g^3*B*d^2/(a*d-b*c)^3*ln(1/(b*x+a)*a*d-b*c
/(b*x+a)-d)*c
```

Maxima [B] time = 1.21986, size = 413, normalized size = 2.97

$$-\frac{1}{2}B\left(\frac{2\,bdx-bc+3\,ad}{\left(b^4c-ab^3d\right)g^3x^2+2\left(ab^3c-a^2b^2d\right)g^3x+\left(a^2b^2c-a^3bd\right)g^3}+\frac{\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx+a^2}\right)}{b^3g^3x^2+2\,ab^2g^3x+a^2bg^3}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x, algorithm="maxi
ma")
```

```
[Out] -1/2*B*((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a
^2*b^2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + log(d^2*e*x^2/(b^2*x^2 + 2*a
*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*
x + a^2))/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((
b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*
a*b^2*c*d + a^2*b*d^2)*g^3)) - 1/2*A/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g
^3)
```

Fricas [A] time = 1.00497, size = 495, normalized size = 3.56

$$-\frac{(A-B)b^2c^2-2\,(A-2\,B)abcd+(A-3\,B)a^2d^2+2\left(Bb^2cd-Babd^2\right)x-\left(Bb^2d^2x^2+2\,Babd^2x-Bb^2c^2+2\,Babcd\right)\log\left(\right.}{2\left(\left(b^5c^2-2\,ab^4cd+a^2b^3d^2\right)g^3x^2+2\left(ab^4c^2-2\,a^2b^3cd+a^3b^2d^2\right)g^3x+\left(a^2b^3c^2-2\,a^3b^2cd+a^4bd^2\right)g^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x, algorithm="fric
as")
```

```
[Out] -1/2*((A - B)*b^2*c^2 - 2*(A - 2*B)*a*b*c*d + (A - 3*B)*a^2*d^2 + 2*(B*b^2*
c*d - B*a*b*d^2)*x - (B*b^2*d^2*x^2 + 2*B*a*b*d^2*x - B*b^2*c^2 + 2*B*a*b*c
*d)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^5*c
^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2 + 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^
3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 3.26856, size = 418, normalized size = 3.01

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2a^2bg^3+4ab^2g^3x+2b^3g^3x^2}+\frac{Bd^2\log\left(x+\frac{-\frac{Ba^3d^5}{(ad-bc)^2}+\frac{3Ba^2bcd^4}{(ad-bc)^2}-\frac{3Bab^2c^2d^3}{(ad-bc)^2}+Bad^3+\frac{Bb^3c^3d^2}{(ad-bc)^2}+Bbcd^2}{2Bbd^3}\right)}{bg^3(ad-bc)^2}-\frac{Bd^2\log\left(x+\frac{\frac{Ba^3d^5}{(ad-bc)^2}-\frac{3Ba^2bcd^4}{(ad-bc)^2}+\cdots}{\cdots}\right)}{bg^3(ad\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**3,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(2*a**2*b*g**3 + 4*a*b**2*g**3*x + 2*b*
*3*g**3*x**2) + B*d**2*log(x + (-B*a**3*d**5/(a*d - b*c)**2 + 3*B*a**2*b*c*
d**4/(a*d - b*c)**2 - 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 + B*b*
*3*c**3*d**2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)
**2) - B*d**2*log(x + (B*a**3*d**5/(a*d - b*c)**2 - 3*B*a**2*b*c*d**4/(a*d
- b*c)**2 + 3*B*a*b**2*c**2*d**3/(a*d - b*c)**2 + B*a*d**3 - B*b**3*c**3*d*
*2/(a*d - b*c)**2 + B*b*c*d**2)/(2*B*b*d**3))/(b*g**3*(a*d - b*c)**2) + (-A
*a*d + A*b*c + 3*B*a*d - B*b*c + 2*B*b*d*x)/(2*a**3*b*d*g**3 - 2*a**2*b**2*
c*g**3 + x**2*(2*a*b**3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4
*a*b**3*c*g**3))
```

Giac [A] time = 1.34159, size = 350, normalized size = 2.52

$$-\frac{Bd^2\log(bx+a)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}+\frac{Bd^2\log(dx+c)}{b^3c^2g^3-2\,ab^2cdg^3+a^2bd^2g^3}-\frac{B\log\left(\frac{d^2x^2+2\,cdx+c^2}{b^2x^2+2\,abx+a^2}\right)}{2\left(b^3g^3x^2+2\,ab^2g^3x+a^2bg^3\right)}-\frac{2\cdots}{2\left(b^4cg^3x^2-ab^3dg^3x\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^3,x, algorithm="giac
")
```

```
[Out] -B*d^2*log(b*x + a)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) + B*d^2
*log(d*x + c)/(b^3*c^2*g^3 - 2*a*b^2*c*d*g^3 + a^2*b*d^2*g^3) - 1/2*B*log((
d^2*x^2 + 2*c*d*x + c^2)/(b^2*x^2 + 2*a*b*x + a^2))/(b^3*g^3*x^2 + 2*a*b^2*
g^3*x + a^2*b*g^3) - 1/2*(2*B*b*d*x + A*b*c - A*a*d + 2*B*a*d)/(b^4*c*g^3*x
^2 - a*b^3*d*g^3*x^2 + 2*a*b^3*c*g^3*x - 2*a^2*b^2*d*g^3*x + a^2*b^2*c*g^3
- a^3*b*d*g^3)
```

3.208 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=177

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{3bg^4(a+bx)^3}+\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}+\frac{}{9bg^4}$$

```
[Out] (2*B)/(9*b*g^4*(a + b*x)^3) - (B*d)/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (2*
B*d^2)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (2*B*d^3*Log[a + b*x])/(3*b*(b*c
 - a*d)^3*g^4) - (2*B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) - (A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2])/(3*b*g^4*(a + b*x)^3)
```

Rubi [A] time = 0.120882, antiderivative size = 177, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{3bg^4(a+bx)^3}+\frac{2Bd^2}{3bg^4(a+bx)(bc-ad)^2}+\frac{2Bd^3\log(a+bx)}{3bg^4(bc-ad)^3}-\frac{2Bd^3\log(c+dx)}{3bg^4(bc-ad)^3}-\frac{Bd}{3bg^4(a+bx)^2(bc-ad)}+\frac{}{9bg^4}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] (2*B)/(9*b*g^4*(a + b*x)^3) - (B*d)/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (2*
B*d^2)/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) + (2*B*d^3*Log[a + b*x])/(3*b*(b*c
 - a*d)^3*g^4) - (2*B*d^3*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) - (A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2])/(3*b*g^4*(a + b*x)^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^4}\,dx = -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bg^4(a+bx)^3}+\frac{B\int\frac{2(-bc+ad)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bg^4(a+bx)^3}-\frac{(2B(bc-ad))\int\frac{1}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bg^4(a+bx)^3}-\frac{(2B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^4}-\frac{bd}{(bc-ad)^2(a+bx)^3}+\frac{bd^2}{(bc-ad)^3(a+bx)^2}-\cdots\right)}{3bg^4}$$

$$= \frac{2B}{9bg^4(a+bx)^3}-\frac{Bd}{3b(bc-ad)g^4(a+bx)^2}+\frac{2Bd^2}{3b(bc-ad)^2g^4(a+bx)}+\frac{2Bd^3\log(a+bx)}{3b(bc-ad)^3g^4}-\cdots$$

Mathematica [A] time = 0.120337, size = 140, normalized size = 0.79

$$\frac{\frac{B\left(6d^2(a+bx)^2(bc-ad)-6d^3(a+bx)^3\log(c+dx)-3d(a+bx)(bc-ad)^2+2(bc-ad)^3+6d^3(a+bx)^3\log(a+bx)\right)}{(bc-ad)^3}-3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{9bg^4(a+bx)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^4,x]
```

```
[Out] ((B*(2*(b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a +
 b*x)^2 + 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]))
/(b*c - a*d)^3 - 3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(9*b*g^4*(a +
b*x)^3)
```

Maple [B] time = 0.059, size = 427, normalized size = 2.4

$$-\frac{A}{3\,b\left(bx+a\right)^{3}g^{4}}-\frac{B}{3\,b\left(bx+a\right)^{3}g^{4}}\ln\left(\frac{e}{b^{2}}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^{2}\right)+\frac{2\,Ba^{3}d^{3}}{9\,bg^{4}\left(ad-bc\right)^{3}\left(bx+a\right)^{3}}-\frac{2\,Ba^{2}d^{2}c}{3\,g^{4}\left(ad-bc\right)^{3}\left(bx+a\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3/b/(b*x+a)^3/g^4*A-1/3/b/g^4*B/(b*x+a)^3*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a
)-d)^2/b^2)+2/9/b/g^4*B*a^3*d^3/(a*d-b*c)^3/(b*x+a)^3-2/3/g^4*B*a^2*d^2/(a*
d-b*c)^3/(b*x+a)^3*c+2/3*b/g^4*B*a*d/(a*d-b*c)^3/(b*x+a)^3*c^2+1/3/b/g^4*B*
a^2*d^3/(a*d-b*c)^3/(b*x+a)^2-2/3/g^4*B*a*d^2/(a*d-b*c)^3/(b*x+a)^2*c+2/3/b
/g^4*B*a*d^3/(a*d-b*c)^3/(b*x+a)+2/3/b/g^4*B*a*d^4/(a*d-b*c)^4*ln(1/(b*x+a)
*a*d-b*c/(b*x+a)-d)-2/9*b^2/g^4*B*c^3/(a*d-b*c)^3/(b*x+a)^3+1/3*b/g^4*B*c^2
/(a*d-b*c)^3/(b*x+a)^2*d-2/3/g^4*B*c/(a*d-b*c)^3/(b*x+a)*d^2-2/3/g^4*B*c*d^
3/(a*d-b*c)^4*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)
```

Maxima [B] time = 1.31059, size = 648, normalized size = 3.66

$$\frac{1}{9}\,B\left(\frac{6\,b^{2}d^{2}x^{2}+2\,b^{2}c^{2}-7\,abcd+11\,a^{2}d^{2}-3\left(b^{2}cd-5\,abd^{2}\right)x}{\left(b^{6}c^{2}-2\,ab^{5}cd+a^{2}b^{4}d^{2}\right)g^{4}x^{3}+3\left(ab^{5}c^{2}-2\,a^{2}b^{4}cd+a^{3}b^{3}d^{2}\right)g^{4}x^{2}+3\left(a^{2}b^{4}c^{2}-2\,a^{3}b^{3}cd+a^{4}b^{2}d^{2}\right)g^{4}x+\left(a^{3}b^{3}c^{2}-\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x, algorithm="maxi
ma")
```

```
[Out] 1/9*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d - 5
*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^2
- 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d + a
^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) - 3*log(
d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) +
 c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^
2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2
*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d
 + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*A/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^
2 + 3*a^2*b^2*g^4*x + a^3*b*g^4)
```

Fricas [B] time = 1.07831, size = 869, normalized size = 4.91

$$-\frac{(3A-2B)b^3c^3-9(A-B)ab^2c^2d+9(A-2B)a^2bcd^2-(3A-11B)a^3d^3-6\left(Bb^3cd^2-Bab^2d^3\right)x^2+3\left(Bb^3c^2d-6Ba\right.}{9\left(\left(b^7c^3-3ab^6c^2d+3a^2b^5cd^2-a^3b^4d^3\right)g^4x^3+3\left(ab^6c^3-3a^2b^5c^2d+3a^3b^4cd^2-a^4b^3d^3\right)g^4x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x, algorithm="fric
as")
```

```
[Out] -1/9*((3*A - 2*B)*b^3*c^3 - 9*(A - B)*a*b^2*c^2*d + 9*(A - 2*B)*a^2*b*c*d^2
 - (3*A - 11*B)*a^3*d^3 - 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*x^2 + 3*(B*b^3*c^2*
d - 6*B*a*b^2*c*d^2 + 5*B*a^2*b*d^3)*x + 3*(B*b^3*d^3*x^3 + 3*B*a*b^2*d^3*x
^2 + 3*B*a^2*b*d^3*x + B*b^3*c^3 - 3*B*a*b^2*c^2*d + 3*B*a^2*b*c*d^2)*log((
d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^7*c^3 - 3*a*
b^6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b
^5*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*
b^4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3
*c^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

Sympy [B] time = 5.36037, size = 677, normalized size = 3.82

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3a^3bg^4+9a^2b^2g^4x+9ab^3g^4x^2+3b^4g^4x^3}+\frac{2Bd^3\log\left(x+\frac{-\frac{2Ba^4d^7}{(ad-bc)^3}+\frac{8Ba^3bcd^6}{(ad-bc)^3}-\frac{12Ba^2b^2c^2d^5}{(ad-bc)^3}+\frac{8Bab^3c^3d^4}{(ad-bc)^3}+2Bad^4-\frac{2Bb^4c^4d^3}{(ad-bc)^3}+2Bbcd^3}{4Bbd^4}\right)}{3bg^4(ad-bc)^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**4,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(3*a**3*b*g**4 + 9*a**2*b**2*g**4*x + 9
*a*b**3*g**4*x**2 + 3*b**4*g**4*x**3) + 2*B*d**3*log(x + (-2*B*a**4*d**7/(a
*d - b*c)**3 + 8*B*a**3*b*c*d**6/(a*d - b*c)**3 - 12*B*a**2*b**2*c**2*d**5/
(a*d - b*c)**3 + 8*B*a*b**3*c**3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 - 2*B*b**
4*c**4*d**3/(a*d - b*c)**3 + 2*B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b
*c)**3) - 2*B*d**3*log(x + (2*B*a**4*d**7/(a*d - b*c)**3 - 8*B*a**3*b*c*d**
6/(a*d - b*c)**3 + 12*B*a**2*b**2*c**2*d**5/(a*d - b*c)**3 - 8*B*a*b**3*c**
3*d**4/(a*d - b*c)**3 + 2*B*a*d**4 + 2*B*b**4*c**4*d**3/(a*d - b*c)**3 + 2*
B*b*c*d**3)/(4*B*b*d**4))/(3*b*g**4*(a*d - b*c)**3) + (-3*A*a**2*d**2 + 6*A
```

```
*a*b*c*d - 3*A*b**2*c**2 + 11*B*a**2*d**2 - 7*B*a*b*c*d + 2*B*b**2*c**2 + 6
*B*b**2*d**2*x**2 + x*(15*B*a*b*d**2 - 3*B*b**2*c*d))/(9*a**5*b*d**2*g**4 -
 18*a**4*b**2*c*d*g**4 + 9*a**3*b**3*c**2*g**4 + x**3*(9*a**2*b**4*d**2*g**
4 - 18*a*b**5*c*d*g**4 + 9*b**6*c**2*g**4) + x**2*(27*a**3*b**3*d**2*g**4 -
 54*a**2*b**4*c*d*g**4 + 27*a*b**5*c**2*g**4) + x*(27*a**4*b**2*d**2*g**4 -
 54*a**3*b**3*c*d*g**4 + 27*a**2*b**4*c**2*g**4))
```

Giac [B] time = 1.38949, size = 639, normalized size = 3.61

$$\frac{2\,Bd^3\log\left(bx+a\right)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{2\,Bd^3\log\left(dx+c\right)}{3\left(b^4c^3g^4-3\,ab^3c^2dg^4+3\,a^2b^2cd^2g^4-a^3bd^3g^4\right)}-\frac{B\log\left(\right.}{3\left(b^4g^4x^3+3\,ab^3g\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^4,x, algorithm="giac
")
```

```
[Out] 2/3*B*d^3*log(b*x + a)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g^4 + 3*a^2*b^2*c*d^2*g
^4 - a^3*b*d^3*g^4) - 2/3*B*d^3*log(d*x + c)/(b^4*c^3*g^4 - 3*a*b^3*c^2*d*g
^4 + 3*a^2*b^2*c*d^2*g^4 - a^3*b*d^3*g^4) - 1/3*B*log((d^2*x^2 + 2*c*d*x +
c^2)/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b^2*
g^4*x + a^3*b*g^4) + 1/9*(6*B*b^2*d^2*x^2 - 3*B*b^2*c*d*x + 15*B*a*b*d^2*x
- 3*A*b^2*c^2 - B*b^2*c^2 + 6*A*a*b*c*d - B*a*b*c*d - 3*A*a^2*d^2 + 8*B*a^2
*d^2)/(b^6*c^2*g^4*x^3 - 2*a*b^5*c*d*g^4*x^3 + a^2*b^4*d^2*g^4*x^3 + 3*a*b^
5*c^2*g^4*x^2 - 6*a^2*b^4*c*d*g^4*x^2 + 3*a^3*b^3*d^2*g^4*x^2 + 3*a^2*b^4*c
^2*g^4*x - 6*a^3*b^3*c*d*g^4*x + 3*a^4*b^2*d^2*g^4*x + a^3*b^3*c^2*g^4 - 2*
a^4*b^2*c*d*g^4 + a^5*b*d^2*g^4)
```

3.209 $\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=208

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}-\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}-\frac{}{6bg^5}$$

```
[Out] B/(8*b*g^5*(a + b*x)^4) - (B*d)/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) + (B*d^2)
/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3)/(2*b*(b*c - a*d)^3*g^5*(a +
b*x)) - (B*d^4*Log[a + b*x])/(2*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x])
/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(4*b*g^
5*(a + b*x)^4)
```

Rubi [A] time = 0.142715, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2525, 12, 44}

$$-\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A}{4bg^5(a+bx)^4}-\frac{Bd^3}{2bg^5(a+bx)(bc-ad)^3}+\frac{Bd^2}{4bg^5(a+bx)^2(bc-ad)^2}-\frac{Bd^4\log(a+bx)}{2bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)}{2bg^5(bc-ad)^4}-\frac{}{6bg^5}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] B/(8*b*g^5*(a + b*x)^4) - (B*d)/(6*b*(b*c - a*d)*g^5*(a + b*x)^3) + (B*d^2)
/(4*b*(b*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3)/(2*b*(b*c - a*d)^3*g^5*(a +
b*x)) - (B*d^4*Log[a + b*x])/(2*b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x])
/(2*b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(4*b*g^
5*(a + b*x)^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(ag+bgx)^5}\,dx &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4bg^5(a+bx)^4}+\frac{B\int\frac{2(-bc+ad)}{g^4(a+bx)^5(c+dx)}\,dx}{4bg}\\ &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4bg^5(a+bx)^4}-\frac{(B(bc-ad))\int\frac{1}{(a+bx)^5(c+dx)}\,dx}{2bg^5}\\ &= -\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{4bg^5(a+bx)^4}-\frac{(B(bc-ad))\int\left(\frac{b}{(bc-ad)(a+bx)^5}-\frac{bd}{(bc-ad)^2(a+bx)^4}+\frac{bd^2}{(bc-ad)^3(a+bx)^3}-\frac{b}{(bc-ad)}\right.}{2bg^5}\\ &= \frac{B}{8bg^5(a+bx)^4}-\frac{Bd}{6b(bc-ad)g^5(a+bx)^3}+\frac{Bd^2}{4b(bc-ad)^2g^5(a+bx)^2}-\frac{Bd^3}{2b(bc-ad)^3g^5(a+bx)}\end{aligned}$$

Mathematica [A] time = 0.189059, size = 162, normalized size = 0.78

$$\frac{\frac{B\left(6d^2(a+bx)^2(bc-ad)^2+12d^3(a+bx)^3(ad-bc)+12d^4(a+bx)^4\log(c+dx)+4d(a+bx)(ad-bc)^3+3(bc-ad)^4-12d^4(a+bx)^4\log(a+bx)\right)}{(bc-ad)^4}-6\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{24bg^5(a+bx)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(a*g + b*g*x)^5,x]
```

```
[Out] ((B*(3*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2
*(a + b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a
 + b*x] + 12*d^4*(a + b*x)^4*Log[c + d*x]))/(b*c - a*d)^4 - 6*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(24*b*g^5*(a + b*x)^4)
```

Maple [B] time = 0.064, size = 587, normalized size = 2.8

$$-\frac{A}{4\,b\,(bx+a)^4\,g^5}-\frac{B}{4\,b\,(bx+a)^4\,g^5}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)+\frac{Ba^4d^4}{8\,bg^5\,(ad-bc)^4\,(bx+a)^4}-\frac{Ba^3d^3c}{2\,g^5\,(ad-bc)^4\,(bx+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x)
```

```
[Out] -1/4/b/(b*x+a)^4/g^5*A-1/4/b/g^5*B/(b*x+a)^4*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a
)-d)^2/b^2)+1/8/b/g^5*B*a^4*d^4/(a*d-b*c)^4/(b*x+a)^4-1/2/g^5*B*a^3*d^3/(a*
d-b*c)^4/(b*x+a)^4*c+3/4*b/g^5*B*a^2*d^2/(a*d-b*c)^4/(b*x+a)^4*c^2-1/2*b^2/
g^5*B*a*d/(a*d-b*c)^4/(b*x+a)^4*c^3+1/6/b/g^5*B*a^3*d^4/(a*d-b*c)^4/(b*x+a)
^3-1/2/g^5*B*a^2*d^3/(a*d-b*c)^4/(b*x+a)^3*c+1/2*b/g^5*B*a*d^2/(a*d-b*c)^4/
(b*x+a)^3*c^2+1/4/b/g^5*B*a^2*d^4/(a*d-b*c)^4/(b*x+a)^2-1/2/g^5*B*a*d^3/(a*
d-b*c)^4/(b*x+a)^2*c+1/2/b/g^5*B*a*d^4/(a*d-b*c)^4/(b*x+a)+1/2/b/g^5*B*a*d^
5/(a*d-b*c)^5*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)+1/8*b^3/g^5*B*c^4/(a*d-b*c)^4
/(b*x+a)^4-1/6*b^2/g^5*B*c^3/(a*d-b*c)^4/(b*x+a)^3*d+1/4*b/g^5*B*c^2/(a*d-b
*c)^4/(b*x+a)^2*d^2-1/2/g^5*B*c/(a*d-b*c)^4/(b*x+a)*d^3-1/2/g^5*B*c*d^4/(a*
d-b*c)^5*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)
```

Maxima [B] time = 1.3591, size = 944, normalized size = 4.54

$$-\frac{1}{24}\,B\left(\frac{12\,b^3d^3x^3-3\,b^3c^3+13\,ab^2c^2d-23\,a^2bcd^2+25}{\left(b^8c^3-3\,ab^7c^2d+3\,a^2b^6cd^2-a^3b^5d^3\right)g^5x^4+4\left(ab^7c^3-3\,a^2b^6c^2d+3\,a^3b^5cd^2-a^4b^4d^3\right)g^5x^3+6\left(a^2b^6c^3-3\,a^3b\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x, algorithm="maxi
ma")
```

```
[Out] -1/24*B*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25
*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 +
 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3
)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)
*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3
)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^
3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^
```

```
5) + 6*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b
*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/(
(b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)
*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 -
 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5)) - 1/4*A/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3
+ 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5)
```

Fricas [B] time = 1.09048, size = 1328, normalized size = 6.38

$$-\frac{3\,(2\,A-B)b^4c^4-8\,(3\,A-2\,B)ab^3c^3d+36\,(A-B)a^2b^2c^2d^2-24\,(A-2\,B)a^3bcd^3+(6\,A-25\,B)a^4d^4+12\,\left(Bb^4cd^3-Ba\right.}{24\,\left(\left(b^9c^4-4\,ab^8c^3d+6\,a^2b^7c^2d^2-4\,a^3b^6cd^3+a^4b^5d^4\right)g^5x^4+4\,\left(ab^8c^4-4\,a^2b^7c^3d+6\,a^3b^6c^2d^2-4\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x, algorithm="fric
as")
```

```
[Out] -1/24*(3*(2*A - B)*b^4*c^4 - 8*(3*A - 2*B)*a*b^3*c^3*d + 36*(A - B)*a^2*b^2
*c^2*d^2 - 24*(A - 2*B)*a^3*b*c*d^3 + (6*A - 25*B)*a^4*d^4 + 12*(B*b^4*c*d^
3 - B*a*b^3*d^4)*x^3 - 6*(B*b^4*c^2*d^2 - 8*B*a*b^3*c*d^3 + 7*B*a^2*b^2*d^4
)*x^2 + 4*(B*b^4*c^3*d - 6*B*a*b^3*c^2*d^2 + 18*B*a^2*b^2*c*d^3 - 13*B*a^3*
b*d^4)*x - 6*(B*b^4*d^4*x^4 + 4*B*a*b^3*d^4*x^3 + 6*B*a^2*b^2*d^4*x^2 + 4*B
*a^3*b*d^4*x - B*b^4*c^4 + 4*B*a*b^3*c^3*d - 6*B*a^2*b^2*c^2*d^2 + 4*B*a^3*
b*c*d^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((
b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4
)*g^5*x^4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*
c*d^3 + a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5
*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*
b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4
*b^5*c^4 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^
4)*g^5)
```

Sympy [B] time = 8.01469, size = 947, normalized size = 4.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))/(b*g*x+a*g)**5,x)
```

```
[Out] -B*log(e*(c + d*x)**2/(a + b*x)**2)/(4*a**4*b*g**5 + 16*a**3*b**2*g**5*x +
24*a**2*b**3*g**5*x**2 + 16*a*b**4*g**5*x**3 + 4*b**5*g**5*x**4) + B*d**4*l
og(x + (-B*a**5*d**9/(a*d - b*c)**4 + 5*B*a**4*b*c*d**8/(a*d - b*c)**4 - 10
*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 + 10*B*a**2*b**3*c**3*d**6/(a*d - b*c
)**4 - 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 + B*b**5*c**5*d**4/(a
*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) - B*d**4
*log(x + (B*a**5*d**9/(a*d - b*c)**4 - 5*B*a**4*b*c*d**8/(a*d - b*c)**4 + 1
0*B*a**3*b**2*c**2*d**7/(a*d - b*c)**4 - 10*B*a**2*b**3*c**3*d**6/(a*d - b*
c)**4 + 5*B*a*b**4*c**4*d**5/(a*d - b*c)**4 + B*a*d**5 - B*b**5*c**5*d**4/(
a*d - b*c)**4 + B*b*c*d**4)/(2*B*b*d**5))/(2*b*g**5*(a*d - b*c)**4) + (-6*A
*a**3*d**3 + 18*A*a**2*b*c*d**2 - 18*A*a*b**2*c**2*d + 6*A*b**3*c**3 + 25*B
*a**3*d**3 - 23*B*a**2*b*c*d**2 + 13*B*a*b**2*c**2*d - 3*B*b**3*c**3 + 12*B
*b**3*d**3*x**3 + x**2*(42*B*a*b**2*d**3 - 6*B*b**3*c*d**2) + x*(52*B*a**2*
b*d**3 - 20*B*a*b**2*c*d**2 + 4*B*b**3*c**2*d))/(24*a**7*b*d**3*g**5 - 72*a
**6*b**2*c*d**2*g**5 + 72*a**5*b**3*c**2*d*g**5 - 24*a**4*b**4*c**3*g**5 +
x**4*(24*a**3*b**5*d**3*g**5 - 72*a**2*b**6*c*d**2*g**5 + 72*a*b**7*c**2*d*
g**5 - 24*b**8*c**3*g**5) + x**3*(96*a**4*b**4*d**3*g**5 - 288*a**3*b**5*c*
d**2*g**5 + 288*a**2*b**6*c**2*d*g**5 - 96*a*b**7*c**3*g**5) + x**2*(144*a*
*5*b**3*d**3*g**5 - 432*a**4*b**4*c*d**2*g**5 + 432*a**3*b**5*c**2*d*g**5 -
 144*a**2*b**6*c**3*g**5) + x*(96*a**6*b**2*d**3*g**5 - 288*a**5*b**3*c*d**
2*g**5 + 288*a**4*b**4*c**2*d*g**5 - 96*a**3*b**5*c**3*g**5))
```

Giac [B] time = 1.39681, size = 562, normalized size = 2.7

$$\frac{Bd^4\log\left(-\frac{bcg}{bgx+ag}+\frac{adg}{bgx+ag}-d\right)}{2\left(b^5c^4g^5-4\,ab^4c^3dg^5+6\,a^2b^3c^2d^2g^5-4\,a^3b^2cd^3g^5+a^4bd^4g^5\right)}-\frac{Bd^3}{2\left(b^3c^3g^3-3\,ab^2c^2dg^3+3\,a^2bcd^2g^3-a^3d^3g^3\right)\left(bgx+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))/(b*g*x+a*g)^5,x, algorithm="giac
")
```

```
[Out] 1/2*B*d^4*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g) - d)/(b^5*c^4*g^5
- 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*d^3*g^5 + a^4*b*d
^4*g^5) - 1/2*B*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 -
 a^3*d^3*g^3)*(b*g*x + a*g)*b*g) + 1/4*B*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a^
2*d^2*g)*(b*g*x + a*g)^2*b*g^2) - 1/4*B*log((b^2*c^2*g^2/(b*g*x + a*g)^2 -
```

```
2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*g/(b*
g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)/((b*g*x + a*g)^4*b*g) - 1/
6*B*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2) - 1/8*(2*A*b^3*g^3 + B*b^3*g^3)/(
(b*g*x + a*g)^4*b^4*g^4)
```

3.210 $\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=515

$$\frac{8B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{5bd^5}-\frac{4Bg^4(bc-ad)^5\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5bd^5}-\frac{4Bg^4(c+dx)(bc-ad)^4}{5d}$$

```
[Out] (26*B^2*(b*c - a*d)^4*g^4*x)/(15*d^4) - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^
2)/(15*b*d^3) + (2*B^2*(b*c - a*d)^2*g^4*(a + b*x)^3)/(15*b*d^2) - (10*B^2*
(b*c - a*d)^5*g^4*Log[a + b*x])/(3*b*d^5) - (26*B^2*(b*c - a*d)^5*g^4*Log[(
c + d*x)/(a + b*x)])/(15*b*d^5) + (2*B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A + B
*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b*d^3) - (4*B*(b*c - a*d)^2*g^4*(a +
 b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(15*b*d^2) + (B*(b*c - a*
d)*g^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b*d) - (4*B
*(b*c - a*d)^4*g^4*(c + d*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*d
^5) + (g^4*(a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(5*b) -
(4*B*(b*c - a*d)^5*g^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])*Log[1 - (d*
(a + b*x))/(b*(c + d*x))])/(5*b*d^5) + (8*B^2*(b*c - a*d)^5*g^4*PolyLog[2,
(d*(a + b*x))/(b*(c + d*x))])/(5*b*d^5)
```

Rubi [A] time = 0.864275, antiderivative size = 569, normalized size of antiderivative = 1.1, number of steps used = 28, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^4(bc-ad)^5\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{5bd^5}+\frac{4Bg^4(bc-ad)^5\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{5bd^5}+\frac{2Bg^4(a+bx)^2(bc-ad)^3\left(B\right.}{5bd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (-4*A*B*(b*c - a*d)^4*g^4*x)/(5*d^4) + (26*B^2*(b*c - a*d)^4*g^4*x)/(15*d^4
) - (7*B^2*(b*c - a*d)^3*g^4*(a + b*x)^2)/(15*b*d^3) + (2*B^2*(b*c - a*d)^2
*g^4*(a + b*x)^3)/(15*b*d^2) - (10*B^2*(b*c - a*d)^5*g^4*Log[c + d*x])/(3*b
*d^5) + (8*B^2*(b*c - a*d)^5*g^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/(5*b*d^5) - (4*B^2*(b*c - a*d)^5*g^4*Log[c + d*x]^2)/(5*b*d^5) - (4*B
^2*(b*c - a*d)^4*g^4*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(5*b*d^4)
+ (2*B*(b*c - a*d)^3*g^4*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(5*b*d^3) - (4*B*(b*c - a*d)^2*g^4*(a + b*x)^3*(A + B*Log[(e*(c + d*x)^
```

```
2)/(a + b*x)^2]))/(15*b*d^2) + (B*(b*c - a*d)*g^4*(a + b*x)^4*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(5*b*d) + (4*B*(b*c - a*d)^5*g^4*Log[c + d*x]*
(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(5*b*d^5) + (g^4*(a + b*x)^5*(A +
 B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(5*b) + (8*B^2*(b*c - a*d)^5*g^4*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(5*b*d^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^4 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{(2B)\int \frac{2(bc-ad)g^5(a+bx)^4\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right.\right.}{c+dx}}{5bg}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int \frac{(a+bx)^4\left(-A-B\log\left(\frac{e(c\cdot}{(a+\cdot}\right.\right.}{c+dx}}{5b}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int\left(-\frac{b(bc-ad)^3\left(-A-B\log\right.}{d^4}\right.}{}$$

$$= \frac{g^4(a+bx)^5\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{5b} - \frac{\left(4B(bc-ad)g^4\right)\int(a+bx)^3\left(-A-B\right.}{5d}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{2B(bc-ad)^3g^4(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{5bd^3} - \frac{4A}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} - \frac{4B^2(bc-ad)^4g^4(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{5bd^4} + \frac{2B(bc-ad}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} - \frac{8B^2(bc-ad)^5g^4\log(c+dx)}{5bd^5} - \frac{4B^2(bc-ad)^4g^4(a+}{5bd}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2}{}$$

$$= -\frac{4AB(bc-ad)^4g^4x}{5d^4} + \frac{26B^2(bc-ad)^4g^4x}{15d^4} - \frac{7B^2(bc-ad)^3g^4(a+bx)^2}{15bd^3} + \frac{2}{}$$

Mathematica [A] time = 0.481292, size = 524, normalized size = 1.02

$$g^4\left((a+bx)^5\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2-\frac{B(bc-ad)\left(-12B(bc-ad)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-6d^2(a+bx)^2(bc-ad\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g^4*((a + b*x)^5*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 - (B*(b*c - a*
d)*(12*A*b*d*(b*c - a*d)^3*x + 24*B*(b*c - a*d)^4*Log[c + d*x] - 4*B*(b*c -
 a*d)^2*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*
x]) - B*(b*c - a*d)*(6*b*d*(b*c - a*d)^2*x + 3*d^2*(-(b*c) + a*d)*(a + b*x)
^2 + 2*d^3*(a + b*x)^3 - 6*(b*c - a*d)^3*Log[c + d*x]) - 12*B*(b*c - a*d)^3
*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 12*B*d*(b*c - a*d)^3*(a + b*x)*Log
[(e*(c + d*x)^2)/(a + b*x)^2] - 6*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[
(e*(c + d*x)^2)/(a + b*x)^2]) + 4*d^3*(b*c - a*d)*(a + b*x)^3*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]) - 3*d^4*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/
(a + b*x)^2]) - 12*(b*c - a*d)^4*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a
 + b*x)^2]) - 12*B*(b*c - a*d)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Lo
g[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*d^
5)))/(5*b)
```

Maple [F] time = 1.913, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^4\left(A+B\ln\left(\frac{e\left(dx+c\right)^2}{\left(bx+a\right)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^4*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [B] time = 2.02881, size = 3591, normalized size = 6.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/5*A^2*b^4*g^4*x^5 + A^2*a*b^3*g^4*x^4 + 2*A^2*a^2*b^2*g^4*x^3 + 2*A^2*a^3
*b*g^4*x^2 + 2*(x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*
x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/
b + 2*c*log(d*x + c)/d)*A*B*a^4*g^4 + 4*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b
*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x
+ a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x
/(b*d))*A*B*a^3*b*g^4 + 4*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*
c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^
3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*a^2*b^2*g^4 + 2/3*(3*x^4*log(d^2*e*x^
2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(
b^2*x^2 + 2*a*b*x + a^2)) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4
 + (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*
c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*a*b^3*g^4 + 1/15*(6*x^5*log(d^2*e*x^2/(b^2
*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^
2 + 2*a*b*x + a^2)) - 12*a^5*log(b*x + a)/b^5 + 12*c^5*log(d*x + c)/d^5 + (
3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^3 + 6*(b^4*
c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*A*B*b^4*g^4 +
 A^2*a^4*g^4*x + 2/15*((6*g^4*log(e) - 25*g^4)*b^4*c^5 - (30*g^4*log(e) - 1
13*g^4)*a*b^3*c^4*d + 4*(15*g^4*log(e) - 49*g^4)*a^2*b^2*c^3*d^2 - 12*(5*g^
4*log(e) - 13*g^4)*a^3*b*c^2*d^3 + 6*(5*g^4*log(e) - 8*g^4)*a^4*c*d^4)*B^2*
log(d*x + c)/d^5 - 8/5*(b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^
2*g^4 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4 - a^5*d^5*g^4)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^5) + 1/15*(3*B^2*b^5*d^5*g^4*x^5*log(e)^2 + 3*(b^5*c*d^4*g^4*log
(e) + (5*g^4*log(e)^2 - g^4*log(e))*a*b^4*d^5)*B^2*x^4 - 2*((2*g^4*log(e) -
 g^4)*b^5*c^2*d^3 - 2*(5*g^4*log(e) - g^4)*a*b^4*c*d^4 - (15*g^4*log(e)^2 -
 8*g^4*log(e) + g^4)*a^2*b^3*d^5)*B^2*x^3 + ((6*g^4*log(e) - 7*g^4)*b^5*c^3
*d^2 - 3*(10*g^4*log(e) - 9*g^4)*a*b^4*c^2*d^3 + 3*(20*g^4*log(e) - 11*g^4)
*a^2*b^3*c*d^4 + (30*g^4*log(e)^2 - 36*g^4*log(e) + 13*g^4)*a^3*b^2*d^5)*B^
2*x^2 - (2*(6*g^4*log(e) - 13*g^4)*b^5*c^4*d - 2*(30*g^4*log(e) - 59*g^4)*a
*b^4*c^3*d^2 + 12*(10*g^4*log(e) - 17*g^4)*a^2*b^3*c^2*d^3 - 2*(60*g^4*log(
e) - 79*g^4)*a^3*b^2*c*d^4 - (15*g^4*log(e)^2 - 48*g^4*log(e) + 46*g^4)*a^4
*b*d^5)*B^2*x + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*x^4 + 10*B^2*
a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b*d^5*g^4*x +
B^2*a^5*d^5*g^4)*log(b*x + a)^2 + 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5
*g^4*x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*
a^4*b*d^5*g^4*x + (b^5*c^5*g^4 - 5*a*b^4*c^4*d*g^4 + 10*a^2*b^3*c^3*d^2*g^4
 - 10*a^3*b^2*c^2*d^3*g^4 + 5*a^4*b*c*d^4*g^4)*B^2)*log(d*x + c)^2 - 2*(6*B
```

```
^2*b^5*d^5*g^4*x^5*log(e) + 3*(b^5*c*d^4*g^4 + (10*g^4*log(e) - g^4)*a*b^4*
d^5)*B^2*x^4 - 4*(b^5*c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - (15*g^4*log(e) - 4*
g^4)*a^2*b^3*d^5)*B^2*x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a
^2*b^3*c*d^4*g^4 + 2*(5*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 6*(2*b^5
*c^4*d*g^4 - 10*a*b^4*c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d
^4*g^4 - (5*g^4*log(e) - 8*g^4)*a^4*b*d^5)*B^2*x - (12*a*b^4*c^4*d*g^4 - 54
*a^2*b^3*c^3*d^2*g^4 + 94*a^3*b^2*c^2*d^3*g^4 - 77*a^4*b*c*d^4*g^4 - (6*g^4
*log(e) - 25*g^4)*a^5*d^5)*B^2)*log(b*x + a) + 2*(6*B^2*b^5*d^5*g^4*x^5*log
(e) + 3*(b^5*c*d^4*g^4 + (10*g^4*log(e) - g^4)*a*b^4*d^5)*B^2*x^4 - 4*(b^5*
c^2*d^3*g^4 - 5*a*b^4*c*d^4*g^4 - (15*g^4*log(e) - 4*g^4)*a^2*b^3*d^5)*B^2*
x^3 + 6*(b^5*c^3*d^2*g^4 - 5*a*b^4*c^2*d^3*g^4 + 10*a^2*b^3*c*d^4*g^4 + 2*(
5*g^4*log(e) - 3*g^4)*a^3*b^2*d^5)*B^2*x^2 - 6*(2*b^5*c^4*d*g^4 - 10*a*b^4*
c^3*d^2*g^4 + 20*a^2*b^3*c^2*d^3*g^4 - 20*a^3*b^2*c*d^4*g^4 - (5*g^4*log(e)
 - 8*g^4)*a^4*b*d^5)*B^2*x - 12*(B^2*b^5*d^5*g^4*x^5 + 5*B^2*a*b^4*d^5*g^4*
x^4 + 10*B^2*a^2*b^3*d^5*g^4*x^3 + 10*B^2*a^3*b^2*d^5*g^4*x^2 + 5*B^2*a^4*b
*d^5*g^4*x + B^2*a^5*d^5*g^4)*log(b*x + a))*log(d*x + c))/(b*d^5)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\Bigg(A^2b^4g^4x^4 + 4\,A^2ab^3g^4x^3 + 6\,A^2a^2b^2g^4x^2 + 4\,A^2a^3bg^4x + A^2a^4g^4 + \Big(B^2b^4g^4x^4 + 4\,B^2ab^3g^4x^3 + 6\,B^2a^2b^2g^4x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^4*g^4*x^4 + 4*A^2*a*b^3*g^4*x^3 + 6*A^2*a^2*b^2*g^4*x^2 + 4*
A^2*a^3*b*g^4*x + A^2*a^4*g^4 + (B^2*b^4*g^4*x^4 + 4*B^2*a*b^3*g^4*x^3 + 6*
B^2*a^2*b^2*g^4*x^2 + 4*B^2*a^3*b*g^4*x + B^2*a^4*g^4)*log((d^2*e*x^2 + 2*c
*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b^4*g^4*x^4 + 4*A*B*a
*b^3*g^4*x^3 + 6*A*B*a^2*b^2*g^4*x^2 + 4*A*B*a^3*b*g^4*x + A*B*a^4*g^4)*log
((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**4*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{4}\left(B\log\left(\frac{\left(dx+c\right)^{2}e}{\left(bx+a\right)^{2}}\right)+A\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^4*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^4*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

3.211 $\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx$

Optimal. Leaf size=422

$$-\frac{2B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^4}+\frac{Bg^3(bc-ad)^4\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^4}+\frac{Bg^3(c+dx)(bc-ad)^3}{d}$$

```
[Out] (-5*B^2*(b*c - a*d)^3*g^3*x)/(3*d^3) + (B^2*(b*c - a*d)^2*g^3*(a + b*x)^2)/
(3*b*d^2) + (11*B^2*(b*c - a*d)^4*g^3*Log[a + b*x])/(3*b*d^4) + (5*B^2*(b*c
 - a*d)^4*g^3*Log[(c + d*x)/(a + b*x)])/(3*b*d^4) - (B*(b*c - a*d)^2*g^3*(a
 + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(2*b*d^2) + (B*(b*c - a
*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*d) + (B*
(b*c - a*d)^3*g^3*(c + d*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/d^4 +
 (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(4*b) + (B*(b
*c - a*d)^4*g^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])*Log[1 - (d*(a + b*
x))/(b*(c + d*x))])/(b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*PolyLog[2, (d*(a + b
*x))/(b*(c + d*x))])/(b*d^4)
```

Rubi [A] time = 0.740716, antiderivative size = 469, normalized size of antiderivative = 1.11, number of steps used = 24, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{2B^2g^3(bc-ad)^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^4}-\frac{Bg^3(bc-ad)^4\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^4}-\frac{Bg^3(a+bx)^2(bc-ad)^2\left(B\log\right.}{2bd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (A*B*(b*c - a*d)^3*g^3*x)/d^3 - (5*B^2*(b*c - a*d)^3*g^3*x)/(3*d^3) + (B^2*
(b*c - a*d)^2*g^3*(a + b*x)^2)/(3*b*d^2) + (11*B^2*(b*c - a*d)^4*g^3*Log[c
+ d*x])/(3*b*d^4) - (2*B^2*(b*c - a*d)^4*g^3*Log[-((d*(a + b*x))/(b*c - a*d
))]*Log[c + d*x])/(b*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[c + d*x]^2)/(b*d^4)
+ (B^2*(b*c - a*d)^3*g^3*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(b*d^3
) - (B*(b*c - a*d)^2*g^3*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(2*b*d^2) + (B*(b*c - a*d)*g^3*(a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(
a + b*x)^2]))/(3*b*d) - (B*(b*c - a*d)^4*g^3*Log[c + d*x]*(A + B*Log[(e*(c
+ d*x)^2)/(a + b*x)^2]))/(b*d^4) + (g^3*(a + b*x)^4*(A + B*Log[(e*(c + d*x)
^2)/(a + b*x)^2])^2)/(4*b) - (2*B^2*(b*c - a*d)^4*g^3*PolyLog[2, (b*(c + d*
```

```
x))/(b*c - a*d)])/(b*d^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^3 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{B\int \frac{2(bc-ad)g^4(a+bx)^3\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{c+dx}}{2bg}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int \frac{(a+bx)^3\left(-A-B\log\left(\frac{e(c+}{(a+b}\right.\right.}{c+dx}}{b}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int\left(\frac{b(bc-ad)^2\left(-A-B\log\left(\right.\right.}{d^3}\right.}{}$$

$$= \frac{g^3(a+bx)^4\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4b} - \frac{\left(B(bc-ad)g^3\right)\int (a+bx)^2\left(-A-B\,\mathrm{l}\right.}{d}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{B(bc-ad)^2g^3(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2bd^2} + \frac{B(bc}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} + \frac{B^2(bc-ad)^3g^3(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bd^3} - \frac{B(bc-ad)^2g^3(}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} + \frac{2B^2(bc-ad)^4g^3\log(c+dx)}{bd^4} + \frac{B^2(bc-ad)^3g^3(a+bx)}{bd^3}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} + \frac{11B^2(b}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} + \frac{11B^2(b}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} + \frac{11B^2(b}{}$$

$$= \frac{AB(bc-ad)^3g^3x}{d^3} - \frac{5B^2(bc-ad)^3g^3x}{3d^3} + \frac{B^2(bc-ad)^2g^3(a+bx)^2}{3bd^2} + \frac{11B^2(b}{}$$

Mathematica [A] time = 0.324396, size = 402, normalized size = 0.95

$$g^3\left(\frac{2B(bc-ad)\left(-6B(bc-ad)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)+2d^3(a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)+3d^2(a+bx)^2(ad-bc)\left(B\log\left(\frac{e(c+}{(a+}\right.\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g^3*((a + b*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (2*B*(b*c -
a*d)*(6*A*b*d*(b*c - a*d)^2*x + 12*B*(b*c - a*d)^3*Log[c + d*x] - 2*B*(b*c
- a*d)*(2*b*d*(b*c - a*d)*x - d^2*(a + b*x)^2 - 2*(b*c - a*d)^2*Log[c + d*x
]) - 6*B*(b*c - a*d)^2*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 6*B*d*(b*c -
 a*d)^2*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2] + 3*d^2*(-(b*c) + a*d)*(
a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + 2*d^3*(a + b*x)^3*(A
+ B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 6*(b*c - a*d)^3*Log[c + d*x]*(A + B
*Log[(e*(c + d*x)^2)/(a + b*x)^2]) - 6*B*(b*c - a*d)^3*((2*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))
/(b*c - a*d)])))/(3*d^4)))/(4*b)
```

Maple [F] time = 1.569, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^3\left(A+B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^3*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [B] time = 1.95392, size = 2633, normalized size = 6.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")

[Out] 1/4*A^2*b^3*g^3*x^4 + A^2*a*b^2*g^3*x^3 + 3/2*A^2*a^2*b*g^3*x^2 + 2*(x*log(
d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) +
 c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d
)*A*B*a^3*g^3 + 3*(x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/
(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*
x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*A*B*a^2*b*g^3
+ 2*(x^3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a
*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2
*c^3*log(d*x + c)/d^3 + ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)
/(b^2*d^2))*A*B*a*b^2*g^3 + 1/6*(3*x^4*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a
^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)
) + 6*a^4*log(b*x + a)/b^4 - 6*c^4*log(d*x + c)/d^4 + (2*(b^3*c*d^2 - a*b^2
*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d
^3))*A*B*b^3*g^3 + A^2*a^3*g^3*x - 1/3*((3*g^3*log(e) - 11*g^3)*b^3*c^4 - 2
*(6*g^3*log(e) - 19*g^3)*a*b^2*c^3*d + 9*(2*g^3*log(e) - 5*g^3)*a^2*b*c^2*d
^2 - 6*(2*g^3*log(e) - 3*g^3)*a^3*c*d^3)*B^2*log(d*x + c)/d^4 + 2*(b^4*c^4*
g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3 + a^4*d
^4*g^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 4*(
b^4*c*d^3*g^3*log(e) + (3*g^3*log(e)^2 - g^3*log(e))*a*b^3*d^4)*B^2*x^3 - 2
*((3*g^3*log(e) - 2*g^3)*b^4*c^2*d^2 - 4*(3*g^3*log(e) - g^3)*a*b^3*c*d^3 -
 (9*g^3*log(e)^2 - 9*g^3*log(e) + 2*g^3)*a^2*b^2*d^4)*B^2*x^2 + 4*((3*g^3*l
og(e) - 5*g^3)*b^4*c^3*d - (12*g^3*log(e) - 17*g^3)*a*b^3*c^2*d^2 + (18*g^3
*log(e) - 19*g^3)*a^2*b^2*c*d^3 + (3*g^3*log(e)^2 - 9*g^3*log(e) + 7*g^3)*a
^3*b*d^4)*B^2*x + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2
*a^2*b^2*d^4*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a
)^2 + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4
*g^3*x^2 + 4*B^2*a^3*b*d^4*g^3*x - (b^4*c^4*g^3 - 4*a*b^3*c^3*d*g^3 + 6*a^2
*b^2*c^2*d^2*g^3 - 4*a^3*b*c*d^3*g^3)*B^2)*log(d*x + c)^2 - 4*(3*B^2*b^4*d^
4*g^3*x^4*log(e) + 2*(b^4*c*d^3*g^3 + (6*g^3*log(e) - g^3)*a*b^3*d^4)*B^2*x
^3 - 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3 - 3*(2*g^3*log(e) - g^3)*a^2*b^
2*d^4)*B^2*x^2 + 6*(b^4*c^3*d*g^3 - 4*a*b^3*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g
^3 + (2*g^3*log(e) - 3*g^3)*a^3*b*d^4)*B^2*x + (6*a*b^3*c^3*d*g^3 - 21*a^2*
b^2*c^2*d^2*g^3 + 26*a^3*b*c*d^3*g^3 + (3*g^3*log(e) - 11*g^3)*a^4*d^4)*B^2
)*log(b*x + a) + 4*(3*B^2*b^4*d^4*g^3*x^4*log(e) + 2*(b^4*c*d^3*g^3 + (6*g^
3*log(e) - g^3)*a*b^3*d^4)*B^2*x^3 - 3*(b^4*c^2*d^2*g^3 - 4*a*b^3*c*d^3*g^3
 - 3*(2*g^3*log(e) - g^3)*a^2*b^2*d^4)*B^2*x^2 + 6*(b^4*c^3*d*g^3 - 4*a*b^3
*c^2*d^2*g^3 + 6*a^2*b^2*c*d^3*g^3 + (2*g^3*log(e) - 3*g^3)*a^3*b*d^4)*B^2*
x - 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*a*b^3*d^4*g^3*x^3 + 6*B^2*a^2*b^2*d^4*g^
3*x^2 + 4*B^2*a^3*b*d^4*g^3*x + B^2*a^4*d^4*g^3)*log(b*x + a))*log(d*x + c)
)/(b*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\frac{d^2}{b}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2*a^
3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2*a^
3*g^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2
*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^3)*
log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**3*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(bgx + ag\right)^3 \left(B\log\left(\frac{(dx + c)^2 e}{(bx + a)^2}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^3*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

3.212 $\int (ag+bgx)^2 \left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx$

Optimal. Leaf size=343

$$\frac{8B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3bd^3}-\frac{4Bg^2(bc-ad)^3\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bd^3}-\frac{4Bg^2(c+dx)(bc-ad)^2\left(\right.}{3d^3}$$

```
[Out] (4*B^2*(b*c - a*d)^2*g^2*x)/(3*d^2) - (4*B^2*(b*c - a*d)^3*g^2*Log[a + b*x]
)/(b*d^3) - (4*B^2*(b*c - a*d)^3*g^2*Log[(c + d*x)/(a + b*x)])/(3*b*d^3) +
(2*B*(b*c - a*d)*g^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/
(3*b*d) - (4*B*(b*c - a*d)^2*g^2*(c + d*x)*(A + B*Log[(e*(c + d*x)^2)/(a +
b*x)^2]))/(3*d^3) + (g^2*(a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
])^2)/(3*b) - (4*B*(b*c - a*d)^3*g^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
])*Log[1 - (d*(a + b*x))/(b*(c + d*x))])/(3*b*d^3) + (8*B^2*(b*c - a*d)^3*g
^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b*d^3)
```

Rubi [A] time = 0.625311, antiderivative size = 397, normalized size of antiderivative = 1.16, number of steps used = 20, number of rules used = 13, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.382, Rules used = {2525, 12, 2528, 2486, 31, 43, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$\frac{8B^2g^2(bc-ad)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bd^3}+\frac{4Bg^2(bc-ad)^3\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bd^3}-\frac{4ABg^2x(bc-ad)^2}{3d^2}+\frac{2Bg^2(a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (-4*A*B*(b*c - a*d)^2*g^2*x)/(3*d^2) + (4*B^2*(b*c - a*d)^2*g^2*x)/(3*d^2)
- (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(b*d^3) + (8*B^2*(b*c - a*d)^3*g^2
*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*d^3) - (4*B^2*(b*c -
a*d)^3*g^2*Log[c + d*x]^2)/(3*b*d^3) - (4*B^2*(b*c - a*d)^2*g^2*(a + b*x)*L
og[(e*(c + d*x)^2)/(a + b*x)^2])/(3*b*d^2) + (2*B*(b*c - a*d)*g^2*(a + b*x)
^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*d) + (4*B*(b*c - a*d)^3*g
^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*d^3) + (g^2*
(a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(3*b) + (8*B^2*(b*c
 - a*d)^3*g^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*b*d^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{(2B)\int \frac{2(bc-ad)g^3(a+bx)^2\left(-A-B\log\left(\frac{e(c+d\cdots}{(a+b\cdots}\right.\right.}{c+dx}}{3bg}\cdots$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int \frac{(a+bx)^2\left(-A-B\log\left(\cdots\right.\right.}{c+dx}}{3b}\cdots$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int\left(-\frac{b(bc-ad)\left(-A-B\,\mathrm{l}\cdots\right.}{d^2}\cdots\right.}{\cdots}$$

$$= \frac{g^2(a+bx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3b} - \frac{\left(4B(bc-ad)g^2\right)\int(a+bx)\left(-A-\cdots\right.}{3d}\cdots$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{2B(bc-ad)g^2(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3bd} + \cdots$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^2g^2(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{3bd^2} + \frac{2B(bc-\cdots}{\cdots}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} - \frac{8B^2(bc-ad)^3g^2\log(c+dx)}{3bd^3} - \frac{4B^2(bc-ad)^2g^2(a\cdots}{3b\cdots}$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c+dx)}{bd^3}\cdots$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c+dx)}{bd^3}\cdots$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c+dx)}{bd^3}\cdots$$

$$= -\frac{4AB(bc-ad)^2g^2x}{3d^2} + \frac{4B^2(bc-ad)^2g^2x}{3d^2} - \frac{4B^2(bc-ad)^3g^2\log(c+dx)}{bd^3}\cdots$$

Mathematica [A] time = 0.228467, size = 298, normalized size = 0.87

$$g^2\left((a+bx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2-\frac{2B(bc-ad)\left(-2B(bc-ad)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-d^2(a+bx)^2\left(B\log\left(\frac{e(c\cdots}{(a\cdots}\right.\right.\right.}{\cdots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g^2*((a + b*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 - (2*B*(b*c -
a*d)*(2*A*b*d*(b*c - a*d)*x + 4*B*(b*c - a*d)^2*Log[c + d*x] - 2*B*(b*c - a
*d)*(b*d*x + (-(b*c) + a*d)*Log[c + d*x]) + 2*B*d*(b*c - a*d)*(a + b*x)*Log
[(e*(c + d*x)^2)/(a + b*x)^2] - d^2*(a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/
(a + b*x)^2]) - 2*(b*c - a*d)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a
+ b*x)^2]) - 2*B*(b*c - a*d)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/d^3))/(
3*b)
```

Maple [F] time = 1.52, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\left(dx+c\right)^2}{\left(bx+a\right)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^2*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [B] time = 2.05687, size = 1800, normalized size = 5.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] 1/3*A^2*b^2*g^2*x^3 + A^2*a*b*g^2*x^2 + 2*(x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b
*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x
+ a^2)) - 2*a*log(b*x + a)/b + 2*c*log(d*x + c)/d)*A*B*a^2*g^2 + 2*(x^2*log
(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2)
+ c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x
 + c)/d^2 + 2*(b*c - a*d)*x/(b*d))*A*B*a*b*g^2 + 2/3*(x^3*log(d^2*e*x^2/(b^
2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x
^2 + 2*a*b*x + a^2)) - 2*a^3*log(b*x + a)/b^3 + 2*c^3*log(d*x + c)/d^3 + ((
b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*b^2*g^2 +
A^2*a^2*g^2*x + 4/3*((g^2*log(e) - 3*g^2)*b^2*c^3 - (3*g^2*log(e) - 7*g^2)*
a*b*c^2*d + (3*g^2*log(e) - 4*g^2)*a^2*c*d^2)*B^2*log(d*x + c)/d^3 - 8/3*(b
^3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2 - a^3*d^3*g^2)*(log(b*x
+ a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d))
)*B^2/(b*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*log(e)^2 + (2*b^3*c*d^2*g^2*log(e)
 + (3*g^2*log(e)^2 - 2*g^2*log(e))*a*b^2*d^3)*B^2*x^2 - (4*(g^2*log(e) - g^
2)*b^3*c^2*d - 4*(3*g^2*log(e) - 2*g^2)*a*b^2*c*d^2 - (3*g^2*log(e)^2 - 8*g
^2*log(e) + 4*g^2)*a^2*b*d^3)*B^2*x + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*
d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*log(b*x + a)^2 + 4*(
B^2*b^3*d^3*g^2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + (b^
3*c^3*g^2 - 3*a*b^2*c^2*d*g^2 + 3*a^2*b*c*d^2*g^2)*B^2)*log(d*x + c)^2 - 4*
(B^2*b^3*d^3*g^2*x^3*log(e) + (b^3*c*d^2*g^2 + (3*g^2*log(e) - g^2)*a*b^2*d
^3)*B^2*x^2 - (2*b^3*c^2*d*g^2 - 6*a*b^2*c*d^2*g^2 - (3*g^2*log(e) - 4*g^2)
*a^2*b*d^3)*B^2*x - (2*a*b^2*c^2*d*g^2 - 5*a^2*b*c*d^2*g^2 - (g^2*log(e) -
3*g^2)*a^3*d^3)*B^2)*log(b*x + a) + 4*(B^2*b^3*d^3*g^2*x^3*log(e) + (b^3*c*
d^2*g^2 + (3*g^2*log(e) - g^2)*a*b^2*d^3)*B^2*x^2 - (2*b^3*c^2*d*g^2 - 6*a*
b^2*c*d^2*g^2 - (3*g^2*log(e) - 4*g^2)*a^2*b*d^3)*B^2*x - 2*(B^2*b^3*d^3*g^
2*x^3 + 3*B^2*a*b^2*d^3*g^2*x^2 + 3*B^2*a^2*b*d^3*g^2*x + B^2*a^3*d^3*g^2)*
log(b*x + a))*log(d*x + c))/(b*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{d^2ex^2 + 2\,cdex + c^2e}{b^2x^2 + 2\,abx + a^2}\right)^2 + 2\left(ABb^2g\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*x^2
 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*
x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2*g^
```

```
2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)^2 \left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

3.213 $\int (ag + bgx)\left(A + B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx$

Optimal. Leaf size=211

$$-\frac{4B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd^2}+\frac{2Bg(bc-ad)^2\log\left(1-\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^2}+\frac{2Bg(c+dx)(bc-ad)\left(\right.}{d^2}$$

```
[Out] (4*B^2*(b*c - a*d)^2*g*Log[a + b*x])/(b*d^2) + (2*B*(b*c - a*d)*g*(c + d*x)
*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/d^2 + (g*(a + b*x)^2*(A + B*Log[
(e*(c + d*x)^2)/(a + b*x)^2])^2)/(2*b) + (2*B*(b*c - a*d)^2*g*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2])*Log[1 - (d*(a + b*x))/(b*(c + d*x))])/(b*d^2) -
 (4*B^2*(b*c - a*d)^2*g*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d^2)
```

Rubi [A] time = 0.504235, antiderivative size = 291, normalized size of antiderivative = 1.38, number of steps used = 16, number of rules used = 12, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2394, 2393, 2391, 2390, 2301}

$$-\frac{4B^2g(bc-ad)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bd^2}-\frac{2Bg(bc-ad)^2\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bd^2}+\frac{g(a+bx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (2*A*B*(b*c - a*d)*g*x)/d + (4*B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b*d^2) -
(4*B^2*(b*c - a*d)^2*g*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*d
^2) + (2*B^2*(b*c - a*d)^2*g*Log[c + d*x]^2)/(b*d^2) + (2*B^2*(b*c - a*d)*g
*(a + b*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(b*d) - (2*B*(b*c - a*d)^2*g*L
og[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*d^2) + (g*(a + b*x
)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(2*b) - (4*B^2*(b*c - a*d)^
2*g*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*d^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
```

```
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2 dx = \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{B\int \frac{2(bc-ad)g^2(a+bx)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{c+dx}dx}{bg}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int \frac{(a+bx)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right.}{c+dx}}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int\left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{d}+\right.}{b}$$

$$= \frac{g(a+bx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2b} - \frac{(2B(bc-ad)g)\int\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right.\right.}{d}$$

$$= \frac{2AB(bc-ad)gx}{d} - \frac{2B(bc-ad)^2g\log(c+dx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bd^2} + \frac{g(a}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{bd} - \frac{2B(bc-ad)^2g\log}{}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} + \frac{2B^2(bc-ad)g(a+bx)\log}{bd}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} + \frac{2B^2(bc-ad)g(a+bx)\log}{bd}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{4B^2(bc-ad)^2g\log\left(-\frac{d(a+}{bc-}\right.}{bd^2}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{4B^2(bc-ad)^2g\log\left(-\frac{d(a+}{bc-}\right.}{bd^2}$$

$$= \frac{2AB(bc-ad)gx}{d} + \frac{4B^2(bc-ad)^2g\log(c+dx)}{bd^2} - \frac{4B^2(bc-ad)^2g\log\left(-\frac{d(a+}{bc-}\right.}{bd^2}$$

Mathematica [A] time = 0.173962, size = 195, normalized size = 0.92

$$\frac{g\left(\frac{4B(bc-ad)\left((2aBd-2bBc)\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)-(bc-ad)\log(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+2B\log\left(\frac{d(a+bx)}{ad-bc}\right)+A-2B\right)+Bd(a+bx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+B(bc-ad)\log^2(c+dx)+\cdots}{d^2}\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] (g*((a + b*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (4*B*(b*c - a*
d)*(A*b*d*x + B*(b*c - a*d)*Log[c + d*x]^2 + B*d*(a + b*x)*Log[(e*(c + d*x)
^2)/(a + b*x)^2] - (b*c - a*d)*Log[c + d*x]*(A - 2*B + 2*B*Log[(d*(a + b*x)
)/(-(b*c) + a*d)] + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]) + (-2*b*B*c + 2*a*B
*d)*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/d^2))/(2*b)
```

Maple [F] time = 1.257, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)\left(A+B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)*(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [B] time = 1.67505, size = 986, normalized size = 4.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] 1/2*A^2*b*g*x^2 + 2*(x*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/
(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - 2*a*log(b*x
```

```
+ a)/b + 2*c*log(d*x + c)/d)*A*B*a*g + (x^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*
x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x +
 a^2)) + 2*a^2*log(b*x + a)/b^2 - 2*c^2*log(d*x + c)/d^2 + 2*(b*c - a*d)*x/
(b*d))*A*B*b*g + A^2*a*g*x - 2*((g*log(e) - 2*g)*b*c^2 - 2*(g*log(e) - g)*a
*c*d)*B^2*log(d*x + c)/d^2 + 4*(b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(log(b
*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*
d)))*B^2/(b*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(2*b^2*c*d*g*log(e)
+ (g*log(e)^2 - 2*g*log(e))*a*b*d^2)*B^2*x + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a)^2 + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*a
*b*d^2*g*x - (b^2*c^2*g - 2*a*b*c*d*g)*B^2)*log(d*x + c)^2 - 4*(B^2*b^2*d^2
*g*x^2*log(e) + 2*((g*log(e) - g)*a*b*d^2 + b^2*c*d*g)*B^2*x + ((g*log(e) -
 2*g)*a^2*d^2 + 2*a*b*c*d*g)*B^2)*log(b*x + a) + 4*(B^2*b^2*d^2*g*x^2*log(e
) + 2*((g*log(e) - g)*a*b*d^2 + b^2*c*d*g)*B^2*x - 2*(B^2*b^2*d^2*g*x^2 + 2
*B^2*a*b*d^2*g*x + B^2*a^2*d^2*g)*log(b*x + a))*log(d*x + c))/(b*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2bgx + A^2ag + \left(B^2bgx + B^2ag\right)\log\left(\frac{d^2ex^2 + 2\,cdex + c^2e}{b^2x^2 + 2\,abx + a^2}\right)^2 + 2\left(ABbgx + ABag\right)\log\left(\frac{d^2ex^2 + 2\,cdex + c^2e}{b^2x^2 + 2\,abx + a^2}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d^2*e*x^2 + 2*c*d
*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log((d
^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bgx+ag)\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)*(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

3.214 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{ag+bgx}\,dx$

Optimal. Leaf size=132

$$-\frac{4B\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg}+\frac{8B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)}{bg}-\frac{\log\left(-\frac{bc-ad}{d(a+bx)}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{bg}$$

```
[Out] -((Log[-((b*c - a*d)/(d*(a + b*x)))]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
])^2)/(b*g)) - (4*B*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])*PolyLog[2, (b*
(c + d*x))/(d*(a + b*x))])/(b*g) + (8*B^2*PolyLog[3, (b*(c + d*x))/(d*(a +
b*x))])/(b*g)
```

Rubi [B] time = 4.0796, antiderivative size = 740, normalized size of antiderivative = 5.61, number of steps used = 46, number of rules used = 23, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.676, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2499, 2302, 30, 2396, 2433, 2374, 6589, 2500, 2440, 2434, 2375, 2317}

$$-\frac{4AB\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg}+\frac{4B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\left(-\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+\log\left(\frac{1}{(a+bx)^2}\right)+\log\left((c+dx)^2\right)\right)}{bg}-\frac{8B^2\text{PolyL}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (2*A*B*Log[g*(a + b*x)]^2)/(b*g) + (4*B^2*Log[g*(a + b*x)]^3)/(3*b*g) - (B^
2*Log[(a + b*x)^(-2)]^2*Log[c + d*x])/(b*g) - (4*B^2*Log[(a + b*x)^(-2)]*Lo
g[g*(a + b*x)]*Log[c + d*x])/(b*g) - (4*B^2*Log[g*(a + b*x)]^2*Log[c + d*x]
)/(b*g) + (B^2*Log[(a + b*x)^(-2)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g)
+ (4*B^2*Log[g*(a + b*x)]^2*Log[(b*(c + d*x))/(b*c - a*d)])/(b*g) + (B^2*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[(c + d*x)^2]^2)/(b*g) - (B^2*Log[g*(a +
 b*x)]*Log[(c + d*x)^2]^2)/(b*g) - (4*A*B*Log[(b*(c + d*x))/(b*c - a*d)]*Lo
g[a*g + b*g*x])/(b*g) + (4*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*(Log[(a + b*x
)^(-2)] + Log[(c + d*x)^2] - Log[(e*(c + d*x)^2)/(a + b*x)^2])*Log[a*g + b*
g*x])/(b*g) + ((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2*Log[a*g + b*g*x])
/(b*g) - (4*B^2*Log[(b*(c + d*x))/(b*c - a*d)]*Log[a*g + b*g*x]^2)/(b*g) +
(2*B^2*Log[(e*(c + d*x)^2)/(a + b*x)^2]*Log[a*g + b*g*x]^2)/(b*g) - (4*A*B*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) - (4*B^2*Log[(a + b*x)^(-2)
]*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*g) + (4*B^2*(Log[(a + b*x)^(
```

```
-2)] + Log[(c + d*x)^2] - Log[(e*(c + d*x)^2)/(a + b*x)^2])*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))]])/(b*g) + (4*B^2*Log[(c + d*x)^2]*PolyLog[2, (b*(c
 + d*x))/(b*c - a*d)])/(b*g) - (8*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d
))])/(b*g) - (8*B^2*PolyLog[3, (b*(c + d*x))/(b*c - a*d)])/(b*g)
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2499

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.))^(m_.))/((j_.
) + (k_.)*(x_)), x_Symbol] :> Simp[((s + t*Log[i*(g + h*x)^n])^(m + 1)*Log[
e*(f*(a + b*x)^p*(c + d*x)^q)^r])/(k*n*t*(m + 1)), x] + (-Dist[(b*p*r)/(k*n
*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(a + b*x), x], x] - Dis
t[(d*q*r)/(k*n*t*(m + 1)), Int[(s + t*Log[i*(g + h*x)^n])^(m + 1)/(c + d*x)
, x], x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, m, n, p, q, r},
x] && NeQ[b*c - a*d, 0] && EqQ[h*j - g*k, 0] && IGtQ[m, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
```

```
[b*c - a*d, 0]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2434

```
Int[(((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.
)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.)))/(x_), x_Symbol] :> Simp[Log[x]*(a + b
*Log[c*(d + e*x)^n])*(f + g*Log[h*(i + j*x)^m]), x] + (-Dist[e*g*m, Int[(Lo
g[x]*(a + b*Log[c*(d + e*x)^n]))/(d + e*x), x], x] - Dist[b*j*n, Int[(Log[x
]*(f + g*Log[h*(i + j*x)^m]))/(i + j*x), x], x]) /; FreeQ[{a, b, c, d, e, f
, g, h, i, j, m, n}, x] && EqQ[e*i - d*j, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{ag+bgx}\,dx = \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)^2\left(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\right)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\cdots}{e(c+dx)^2}\cdots}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{(a+bx)^2\left(\frac{2de(c+dx)}{(a+bx)^2}-\frac{2be(c+dx)^2}{(a+bx)^3}\right)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\cdots}{(c+dx)^2}\cdots}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(2B)\int \frac{2(bc-ad)e\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{beg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \frac{\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{(a+bx)(c+dx)}\,dx}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{(bc-ad)(a+bx)}+\cdots\right.}{bg}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \frac{\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)\log(ag+bgx)}{a+bx}\,dx}{g} - \frac{(4Bd)\cdots}{\cdots}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4B)\int \left(\frac{A\log(ag+bgx)}{-a-bx}+\frac{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\log(ag+bgx)}{-a-bx}\right)\cdots}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} - \frac{(4AB)\int \frac{\log(ag+bgx)}{-a-bx}\,dx}{g} - \frac{\left(4B^2\right)\int \frac{\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\log\cdots}{-a-bx}\cdots}{g}$$

$$= -\frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2\log(ag+bgx)}{bg} + \frac{2B^2\log\left(\cdots\right)\cdots}{\cdots}$$

$$= -\frac{4AB\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(ag+bgx)}{bg} + \frac{4B^2\log\left(\frac{b(c+dx)}{bc-ad}\right)\left(\log\left(\frac{1}{(a+bx)^2}\right)+\log\left((c+dx)^2\right)-\cdots\right.}{bg}$$

$$= \frac{2AB\log^2(g(a+bx))}{bg} - \frac{4B^2\log\left(\frac{1}{(a+bx)^2}\right)\log(g(a+bx))\log(c+dx)}{bg} - \frac{B^2\log(g(a+bx))\cdots}{bg}$$

$$2AB\log^2(g(a+bx)) \quad 4B^2\log\left(\frac{1}{\cdots}\right)\log(g(a+bx))\log(c+dx) \quad B^2\log\left(-\frac{d(a+bx)}{\cdots}\right)\cdots$$

Mathematica [A] time = 0.330015, size = 257, normalized size = 1.95

$$\frac{4AB\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)-4B^2\text{PolyLog}\left(2,\frac{b(c+dx)}{d(a+bx)}\right)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+8B^2\text{PolyLog}\left(3,\frac{b(c+dx)}{d(a+bx)}\right)+A^2\log(a+bx)+2AB\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x),x]
```

```
[Out] (-2*A*B*Log[a/b + x]^2 + A^2*Log[a + b*x] + 4*A*B*Log[a/b + x]*Log[a + b*x]
 - 4*A*B*Log[c/d + x]*Log[a + b*x] + 4*A*B*Log[c/d + x]*Log[(d*(a + b*x))/(
-(b*c) + a*d)] + 2*A*B*Log[a + b*x]*Log[(e*(c + d*x)^2)/(a + b*x)^2] - B^2*
Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(e*(c + d*x)^2)/(a + b*x)^2]^2 + 4*A*
B*PolyLog[2, (b*(c + d*x))/(b*c - a*d)] - 4*B^2*Log[(e*(c + d*x)^2)/(a + b*
x)^2]*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 8*B^2*PolyLog[3, (b*(c + d*
x))/(d*(a + b*x))])/(b*g)
```

Maple [F] time = 1.391, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x)
```

```
[Out] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x)
```

Maximum [F] time = 0., size = 0, normalized size = 0.

$$\frac{4\,B^2\log(bx+a)\log(dx+c)^2}{bg}+\frac{A^2\log\left(bgx+ag\right)}{bg}-\int-\frac{B^2bc\log(e)^2+2\,ABbc\log(e)+4\left(B^2bdx+B^2bc\right)\log(bx+a)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x, algorithm="maxi
ma")
```

```
[Out] 4*B^2*log(b*x + a)*log(d*x + c)^2/(b*g) + A^2*log(b*g*x + a*g)/(b*g) - inte
grate(-(B^2*b*c*log(e)^2 + 2*A*B*b*c*log(e) + 4*(B^2*b*d*x + B^2*b*c)*log(b
*x + a)^2 + (B^2*b*d*log(e)^2 + 2*A*B*b*d*log(e))*x - 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x)*log(b*x + a) + 4*(B^2*b*c*log(e) + A
*B*b*c + (B^2*b*d*log(e) + A*B*b*d)*x - 2*(2*B^2*b*d*x + (b*c + a*d)*B^2)*l
og(b*x + a))*log(d*x + c))/(b^2*d*g*x^2 + a*b*c*g + (b^2*c*g + a*b*d*g)*x),
 x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\,AB\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A^2}{bgx+ag},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)
)^2 + 2*A*B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))
+ A^2)/(b*g*x + a*g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{bgx+ag}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g),x, algorithm="giac
")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2/(b*g*x + a*g), x)
```

3.215 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx$

Optimal. Leaf size=157

$$-\frac{(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{g^2(a+bx)(bc-ad)}+\frac{4AB(c+dx)}{g^2(a+bx)(bc-ad)}+\frac{4B^2(c+dx)\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{g^2(a+bx)(bc-ad)}-\frac{8B^2(c+dx)}{g^2(a+bx)(bc-ad)}$$

```
[Out] (4*A*B*(c + d*x))/((b*c - a*d)*g^2*(a + b*x)) - (8*B^2*(c + d*x))/((b*c - a
*d)*g^2*(a + b*x)) + (4*B^2*(c + d*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/((b
*c - a*d)*g^2*(a + b*x)) - ((c + d*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^
2])^2)/((b*c - a*d)*g^2*(a + b*x))
```

Rubi [C] time = 0.923751, antiderivative size = 480, normalized size of antiderivative = 3.06, number of steps used = 26, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^2(bc-ad)}-\frac{8B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^2(bc-ad)}+\frac{4Bd\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^2(bc-ad)}-\frac{4Bd\log(c+dx)\left(\ldots\right.}{bg^2(\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] (-8*B^2)/(b*g^2*(a + b*x)) - (8*B^2*d*Log[a + b*x])/(b*(b*c - a*d)*g^2) + (
4*B^2*d*Log[a + b*x]^2)/(b*(b*c - a*d)*g^2) + (8*B^2*d*Log[c + d*x])/(b*(b*
c - a*d)*g^2) - (8*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b
*(b*c - a*d)*g^2) + (4*B^2*d*Log[c + d*x]^2)/(b*(b*c - a*d)*g^2) - (8*B^2*d
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2) + (4*B*(A
 + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*g^2*(a + b*x)) + (4*B*d*Log[a +
b*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^2) - (4*B*d
*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^2)
 - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(b*g^2*(a + b*x)) - (8*B^2*d*
PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)*g^2) - (8*B^2*d*Po
lyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)*g^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
```

qQ[e*f - d*g, 0]

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(2B)\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g(a+bx)^2(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^2(c+dx)}\,dx}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^2} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)^2(a+bx)} + \cdots\right.}{bg^2}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{bg^2(a+bx)} + \frac{(4B)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^2}\,dx}{g^2} - \frac{(4Bd)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{a+bx}\,dx}{(bc-ad)g^2} + \cdots$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{4Bd\log(c+dx)\left(A \cdots\right.}{b(bc-\cdots}$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{4Bd\log(c+dx)\left(A \cdots\right.}{b(bc-\cdots}$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd\log(a+bx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^2} - \frac{4Bd\log(c+dx)\left(A \cdots\right.}{b(bc-\cdots}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} + \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^2(a+bx)} + \frac{4Bd \cdots}{\cdots}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{8B^2d\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(c+dx)}{b(bc-ad)g^2} \cdots$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{8B^2d\log\left(-\cdots\right.}{b(\cdots}$$

$$= -\frac{8B^2}{bg^2(a+bx)} - \frac{8B^2d\log(a+bx)}{b(bc-ad)g^2} + \frac{4B^2d\log^2(a+bx)}{b(bc-ad)g^2} + \frac{8B^2d\log(c+dx)}{b(bc-ad)g^2} - \frac{8B^2d\log\left(-\cdots\right.}{b(\cdots}$$

Mathematica [C] time = 0.475139, size = 322, normalized size = 2.05

$$-\frac{\frac{4B\left(-Bd(a+bx)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(a+bx)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-(bc}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^2,x]
```

```
[Out] -(((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (4*B*(2*B*(b*c - a*d + d*(a
 + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - (b*c - a*d)*(A + B*Log[(
e*(c + d*x)^2)/(a + b*x)^2]) - d*(a + b*x)*Log[a + b*x]*(A + B*Log[(e*(c +
d*x)^2)/(a + b*x)^2]) + d*(a + b*x)*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)
/(a + b*x)^2]) - B*d*(a + b*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + B*d*(a
+ b*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] +
 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d))/(b*g^2*(a + b*x)))
```

Maple [B] time = 0.069, size = 452, normalized size = 2.9

$$-\frac{A^2}{bg^2(bx+a)}-\frac{B^2}{bg^2(bx+a)}\left(\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)\right)^2-8\frac{B^2}{bg^2(bx+a)}+4\frac{B^2}{bg^2(bx+a)}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x)
```

```
[Out] -1/b/g^2*A^2/(b*x+a)-1/b/g^2/(b*x+a)*B^2*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)
^2/b^2)^2-8/b/g^2*B^2/(b*x+a)+4/b/g^2*B^2/(b*x+a)*ln(e*(1/(b*x+a)*a*d-b*c/(
b*x+a)-d)^2/b^2)-4/b/g^2*B^2*d/(a*d-b*c)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)
^2/b^2)+1/b/g^2*B^2*d/(a*d-b*c)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)^2
-2/b/g^2*A*B/(b*x+a)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+4/b/g^2*A*B/
(a*d-b*c)/(b*x+a)*a*d-4/g^2*A*B/(a*d-b*c)/(b*x+a)*c+4/b/g^2*A*B*d^2/(a*d-b*
c)^2*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)*a-4/g^2*A*B*d/(a*d-b*c)^2*ln(1/(b*x+a)
*a*d-b*c/(b*x+a)-d)*c
```

Maxima [B] time = 1.51879, size = 774, normalized size = 4.93

$$4\left(\left(\frac{1}{b^2g^2x+abg^2}+\frac{d\log(bx+a)}{(b^2c-abd)g^2}-\frac{d\log(dx+c)}{(b^2c-abd)g^2}\right)\log\left(\frac{d^2ex^2}{b^2x^2+2\,abx+a^2}+\frac{2\,cdex}{b^2x^2+2\,abx+a^2}+\frac{c^2e}{b^2x^2+2\,abx+a^2}\right)+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x, algorithm="ma
xima")
```

```
[Out] 4*((1/(b^2*g^2*x + a*b*g^2) + d*log(b*x + a)/((b^2*c - a*b*d)*g^2) - d*log(
d*x + c)/((b^2*c - a*b*d)*g^2))*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2
*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + ((b
*d*x + a*d)*log(b*x + a)^2 + (b*d*x + a*d)*log(d*x + c)^2 - 2*b*c + 2*a*d -
 2*(b*d*x + a*d)*log(b*x + a) + 2*(b*d*x + a*d - (b*d*x + a*d)*log(b*x + a)
)*log(d*x + c))/(a*b^2*c*g^2 - a^2*b*d*g^2 + (b^3*c*g^2 - a*b^2*d*g^2)*x))*
B^2 - 2*A*B*(log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 +
 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^2*g^2*x + a*b*g^2) -
2/(b^2*g^2*x + a*b*g^2) - 2*d*log(b*x + a)/((b^2*c - a*b*d)*g^2) + 2*d*log(
d*x + c)/((b^2*c - a*b*d)*g^2)) - B^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^
2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))
^2/(b^2*g^2*x + a*b*g^2) - A^2/(b^2*g^2*x + a*b*g^2)
```

Fricas [A] time = 1.04988, size = 416, normalized size = 2.65

$$-\frac{(A^2-4\,AB+8\,B^2)bc-(A^2-4\,AB+8\,B^2)ad+(B^2bdx+B^2bc)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\left((AB-2\,B^2)bdx+(AB-2\,\right.}{(b^3c-ab^2d)g^2x+(ab^2c-a^2bd)g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x, algorithm="fr
icas")
```

```
[Out] -((A^2 - 4*A*B + 8*B^2)*b*c - (A^2 - 4*A*B + 8*B^2)*a*d + (B^2*b*d*x + B^2*
b*c)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(
(A*B - 2*B^2)*b*d*x + (A*B - 2*B^2)*b*c)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e
)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^3*c - a*b^2*d)*g^2*x + (a*b^2*c - a^2*b*d
)*g^2)
```

Sympy [B] time = 3.73447, size = 450, normalized size = 2.87

$$\frac{4Bd\left(A-2B\right)\log\left(x+\frac{4ABad^2+4ABbcd-8B^2ad^2-8B^2bcd-\frac{4Ba^2d^3(A-2B)}{ad-bc}+\frac{8Babcd^2(A-2B)}{ad-bc}-\frac{4Bb^2c^2d(A-2B)}{ad-bc}}{8ABbd^2-16B^2bd^2}\right)}{bg^2\left(ad-bc\right)}-\frac{4Bd\left(A-2B\right)\log\left(x+\frac{4ABad^2+4\ldots}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**2,x)
```

```
[Out] 4*B*d*(A - 2*B)*log(x + (4*A*B*a*d**2 + 4*A*B*b*c*d - 8*B**2*a*d**2 - 8*B**
2*b*c*d - 4*B*a**2*d**3*(A - 2*B)/(a*d - b*c) + 8*B*a*b*c*d**2*(A - 2*B)/(a
*d - b*c) - 4*B*b**2*c**2*d*(A - 2*B)/(a*d - b*c))/(8*A*B*b*d**2 - 16*B**2*
b*d**2))/(b*g**2*(a*d - b*c)) - 4*B*d*(A - 2*B)*log(x + (4*A*B*a*d**2 + 4*A
*B*b*c*d - 8*B**2*a*d**2 - 8*B**2*b*c*d + 4*B*a**2*d**3*(A - 2*B)/(a*d - b*
c) - 8*B*a*b*c*d**2*(A - 2*B)/(a*d - b*c) + 4*B*b**2*c**2*d*(A - 2*B)/(a*d
- b*c))/(8*A*B*b*d**2 - 16*B**2*b*d**2))/(b*g**2*(a*d - b*c)) + (-2*A*B + 4
*B**2)*log(e*(c + d*x)**2/(a + b*x)**2)/(a*b*g**2 + b**2*g**2*x) + (B**2*c
+ B**2*d*x)*log(e*(c + d*x)**2/(a + b*x)**2)**2/(a**2*d*g**2 - a*b*c*g**2 +
 a*b*d*g**2*x - b**2*c*g**2*x) - (A**2 - 4*A*B + 8*B**2)/(a*b*g**2 + b**2*g
**2*x)
```

Giac [B] time = 1.43896, size = 505, normalized size = 3.22

$$-\left(\frac{B^2d}{b^2cg^2-abdg^2}+\frac{B^2}{\left(bgx+ag\right)bg}\right)\log\left(\frac{\frac{b^2c^2g^2}{\left(bgx+ag\right)^2}-\frac{2\,abcdg^2}{\left(bgx+ag\right)^2}+\frac{a^2d^2g^2}{\left(bgx+ag\right)^2}+\frac{2\,bcdg}{bgx+ag}-\frac{2\,ad^2g}{bgx+ag}+d^2}{b^2}\right)^2-\frac{4\left(ABd-B^2d\right)\log\left(\ldots\right.}{b^2cg^2-\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^2,x, algorithm="gi
ac")
```

```
[Out] -(B^2*d/(b^2*c*g^2 - a*b*d*g^2) + B^2/((b*g*x + a*g)*b*g))*log((b^2*c^2*g^2
/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g
)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)^2 - 4*(
A*B*d - B^2*d)*log(b*c*g/(b*g*x + a*g) - a*d*g/(b*g*x + a*g) + d)/(b^2*c*g^
```

```
2 - a*b*d*g^2) - 2*(A*B - B^2)*log((b^2*c^2*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d
*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x + a*g)^2 + 2*b*c*d*g/(b*g*x + a*g
) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)/((b*g*x + a*g)*b*g) - (A^2 - 2*A*B
+ 5*B^2)/((b*g*x + a*g)*b*g)
```

3.216 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx$

Optimal. Leaf size=299

$$\frac{bB(c+dx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{g^3(a+bx)^2(bc-ad)^2}-\frac{b(c+dx)^2\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{2g^3(a+bx)^2(bc-ad)^2}+\frac{d(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2}{g^3(a+bx)(bc-ad)^2}-\frac{4ABd(}{g^3(a+bx)}$$

```
[Out] (-4*A*B*d*(c + d*x))/((b*c - a*d)^2*g^3*(a + b*x)) + (8*B^2*d*(c + d*x))/((
b*c - a*d)^2*g^3*(a + b*x)) - (b*B^2*(c + d*x)^2)/((b*c - a*d)^2*g^3*(a + b
*x)^2) - (4*B^2*d*(c + d*x)*Log[(e*(c + d*x)^2)/(a + b*x)^2])/((b*c - a*d)^
2*g^3*(a + b*x)) + (b*B*(c + d*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]
))/((b*c - a*d)^2*g^3*(a + b*x)^2) + (d*(c + d*x)*(A + B*Log[(e*(c + d*x)^2
)/(a + b*x)^2])^2)/((b*c - a*d)^2*g^3*(a + b*x)) - (b*(c + d*x)^2*(A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2])^2)/(2*(b*c - a*d)^2*g^3*(a + b*x)^2)
```

Rubi [C] time = 1.08082, antiderivative size = 578, normalized size of antiderivative = 1.93, number of steps used = 30, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{4B^2d^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^3(bc-ad)^2}+\frac{4B^2d^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^3(bc-ad)^2}-\frac{2Bd^2\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^3(bc-ad)^2}+\frac{2Bd^2\log(c+dx}{bg^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -(B^2/(b*g^3*(a + b*x)^2)) + (6*B^2*d)/(b*(b*c - a*d)*g^3*(a + b*x)) + (6*B
^2*d^2*Log[a + b*x])/(b*(b*c - a*d)^2*g^3) - (2*B^2*d^2*Log[a + b*x]^2)/(b*
(b*c - a*d)^2*g^3) - (6*B^2*d^2*Log[c + d*x])/(b*(b*c - a*d)^2*g^3) + (4*B^
2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(b*(b*c - a*d)^2*g^3)
 - (2*B^2*d^2*Log[c + d*x]^2)/(b*(b*c - a*d)^2*g^3) + (4*B^2*d^2*Log[a + b*
x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3) + (B*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(b*g^3*(a + b*x)^2) - (2*B*d*(A + B*Log[(e*(c
+ d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)*g^3*(a + b*x)) - (2*B*d^2*Log[a + b
*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^2*g^3) + (2*B*
d^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^2
*g^3) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(2*b*g^3*(a + b*x)^2) +
(4*B^2*d^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^2*g^3)
```

```
+ (4*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^2*g^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{B\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g^2(a+bx)^3(c+dx)}\,dx}{bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^3(c+dx)}\,dx}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^3} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)^2(a+bx)^2} + \cdots\right.}{bg^3}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{2bg^3(a+bx)^2} + \frac{(2B)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^3}\,dx}{g^3} + \frac{\left(2Bd^2\right)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{a+bx}\,dx}{(bc-ad)^2g^3} - \cdots$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^3(a+bx)^2} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{2Bd^2\log(a+bx)\left(A+B\log\left(\cdots\right.\right.}{b(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^3(a+bx)^2} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{2Bd^2\log(a+bx)\left(A+B\log\left(\cdots\right.\right.}{b(bc-ad)^2g^3}$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{bg^3(a+bx)^2} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{b(bc-ad)g^3(a+bx)} - \frac{2Bd^2\log(a+bx)\left(A+B\log\left(\cdots\right.\right.}{b(bc-ad)^2g^3}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{6B^2d^2\log(c+dx)}{b(bc-ad)^2g^3} + \frac{B\left(A\cdots\right.}{\cdots}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{6B^2d^2\log(c+dx)}{b(bc-ad)^2g^3} + \frac{4B^2d^2\cdots}{\cdots}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+bx)}{b(bc-ad)^2g^3} - \frac{6B^2d\cdots}{b(\cdots}$$

$$= -\frac{B^2}{bg^3(a+bx)^2} + \frac{6B^2d}{b(bc-ad)g^3(a+bx)} + \frac{6B^2d^2\log(a+bx)}{b(bc-ad)^2g^3} - \frac{2B^2d^2\log^2(a+bx)}{b(bc-ad)^2g^3} - \frac{6B^2d\cdots}{b(\cdots}$$

Mathematica [C] time = 0.484111, size = 452, normalized size = 1.51

$$-\frac{\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2-\frac{2B\left(-2Bd^2(a+bx)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+2Bd^2(a+bx)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^3,x]
```

```
[Out] -((A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 - (2*B*(4*B*d*(a + b*x)*(b*c -
 a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - B*((b*c - a*d
)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2*Log[a + b*x] + 2*d^2
*(a + b*x)^2*Log[c + d*x]) + (b*c - a*d)^2*(A + B*Log[(e*(c + d*x)^2)/(a +
b*x)^2]) + 2*d*(-(b*c) + a*d)*(a + b*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x
)^2]) - 2*d^2*(a + b*x)^2*Log[a + b*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)
^2]) + 2*d^2*(a + b*x)^2*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^
2]) - 2*B*d^2*(a + b*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))
/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*B*d^2*(a +
 b*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x]
+ 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c - a*d)^2)/(2*b*g^3*(a + b
*x)^2)
```

Maple [B] time = 0.07, size = 664, normalized size = 2.2

$$-\frac{A^2}{2b(bx+a)^2g^3}-\frac{B^2}{b(bx+a)^2g^3}+\frac{B^2}{b(bx+a)^2g^3}\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\frac{bc}{bx+a}-d\right)^2\right)-\frac{B^2}{2b(bx+a)^2g^3}\left(\ln\left(\frac{e}{b^2}\left(\frac{ad}{bx+a}-\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x)
```

```
[Out] -1/2/b/(b*x+a)^2/g^3*A^2-1/b/g^3*B^2/(b*x+a)^2+1/b/g^3*B^2/(b*x+a)^2*ln(e*(
1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)-1/2/b/g^3*B^2/(b*x+a)^2*ln(e*(1/(b*x+a)
*a*d-b*c/(b*x+a)-d)^2/b^2)^2-6/b/g^3*B^2*d/(a*d-b*c)/(b*x+a)-3/b/g^3*B^2*d^
2/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+1/2
/b/g^3*B^2*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-
d)^2/b^2)^2+2/b/g^3*B^2*d/(a*d-b*c)/(b*x+a)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)
-d)^2/b^2)-1/b/g^3*A*B/(b*x+a)^2*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+
1/b/g^3*A*B/(a*d-b*c)^2/(b*x+a)^2*a^2*d^2-2/g^3*A*B/(a*d-b*c)^2/(b*x+a)^2*a
*d*c+b/g^3*A*B/(a*d-b*c)^2*c^2/(b*x+a)^2+2/b/g^3*A*B/(a*d-b*c)^2*d^2/(b*x+a
```

```
)*a-2/g^3*A*B/(a*d-b*c)^2*d/(b*x+a)*c+2/b/g^3*A*B*d^3/(a*d-b*c)^3*ln(1/(b*x
+a)*a*d-b*c/(b*x+a)-d)*a-2/g^3*A*B*d^2/(a*d-b*c)^3*ln(1/(b*x+a)*a*d-b*c/(b*
x+a)-d)*c
```

Maxima [B] time = 1.55689, size = 1351, normalized size = 4.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x, algorithm="ma
xima")
```

```
[Out] -((((2*b*d*x - b*c + 3*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^
2*d)*g^3*x + (a^2*b^2*c - a^3*b*d)*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*
a*b^2*c*d + a^2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d +
a^2*b*d^2)*g^3))*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x
^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) + (b^2*c^2 - 8*a*b*c
*d + 7*a^2*d^2 + 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a)^2 + 2
*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(d*x + c)^2 - 6*(b^2*c*d - a*b*d^
2)*x - 6*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log(b*x + a) + 2*(3*b^2*d^2*
x^2 + 6*a*b*d^2*x + 3*a^2*d^2 - 2*(b^2*d^2*x^2 + 2*a*b*d^2*x + a^2*d^2)*log
(b*x + a))*log(d*x + c))/(a^2*b^3*c^2*g^3 - 2*a^3*b^2*c*d*g^3 + a^4*b*d^2*g
^3 + (b^5*c^2*g^3 - 2*a*b^4*c*d*g^3 + a^2*b^3*d^2*g^3)*x^2 + 2*(a*b^4*c^2*g
^3 - 2*a^2*b^3*c*d*g^3 + a^3*b^2*d^2*g^3)*x))*B^2 - A*B*((2*b*d*x - b*c + 3
*a*d)/((b^4*c - a*b^3*d)*g^3*x^2 + 2*(a*b^3*c - a^2*b^2*d)*g^3*x + (a^2*b^2
*c - a^3*b*d)*g^3) + log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b
^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^3*g^3*x^2 + 2
*a*b^2*g^3*x + a^2*b*g^3) + 2*d^2*log(b*x + a)/((b^3*c^2 - 2*a*b^2*c*d + a^
2*b*d^2)*g^3) - 2*d^2*log(d*x + c)/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*g^3
)) - 1/2*B^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 +
 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))^2/(b^3*g^3*x^2 + 2*a*b^2
*g^3*x + a^2*b*g^3) - 1/2*A^2/(b^3*g^3*x^2 + 2*a*b^2*g^3*x + a^2*b*g^3)
```

Fricas [A] time = 1.09039, size = 846, normalized size = 2.83

$$-\frac{\left(A^2-2\,AB+2\,B^2\right)b^2c^2-2\left(A^2-4\,AB+8\,B^2\right)abcd+\left(A^2-6\,AB+14\,B^2\right)a^2d^2-\left(B^2b^2d^2x^2+2\,B^2abd^2x-B^2b^2c^2+2\right.}{2\left(\left(b^5c^2-2\,ab^4\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x, algorithm="fr
icas")
```

```
[Out] -1/2*((A^2 - 2*A*B + 2*B^2)*b^2*c^2 - 2*(A^2 - 4*A*B + 8*B^2)*a*b*c*d + (A^
2 - 6*A*B + 14*B^2)*a^2*d^2 - (B^2*b^2*d^2*x^2 + 2*B^2*a*b*d^2*x - B^2*b^2*
c^2 + 2*B^2*a*b*c*d)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x
 + a^2))^2 + 4*((A*B - 3*B^2)*b^2*c*d - (A*B - 3*B^2)*a*b*d^2)*x - 2*((A*B
- 3*B^2)*b^2*d^2*x^2 - (A*B - B^2)*b^2*c^2 + 2*(A*B - 2*B^2)*a*b*c*d - 2*(B
^2*b^2*c*d - (A*B - 2*B^2)*a*b*d^2)*x)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/
(b^2*x^2 + 2*a*b*x + a^2)))/((b^5*c^2 - 2*a*b^4*c*d + a^2*b^3*d^2)*g^3*x^2
+ 2*(a*b^4*c^2 - 2*a^2*b^3*c*d + a^3*b^2*d^2)*g^3*x + (a^2*b^3*c^2 - 2*a^3*
b^2*c*d + a^4*b*d^2)*g^3)
```

Sympy [B] time = 6.77515, size = 877, normalized size = 2.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**3,x)
```

```
[Out] 2*B*d**2*(A - 3*B)*log(x + (2*A*B*a*d**3 + 2*A*B*b*c*d**2 - 6*B**2*a*d**3 -
 6*B**2*b*c*d**2 - 2*B*a**3*d**5*(A - 3*B)/(a*d - b*c)**2 + 6*B*a**2*b*c*d*
*4*(A - 3*B)/(a*d - b*c)**2 - 6*B*a*b**2*c**2*d**3*(A - 3*B)/(a*d - b*c)**2
 + 2*B*b**3*c**3*d**2*(A - 3*B)/(a*d - b*c)**2)/(4*A*B*b*d**3 - 12*B**2*b*d
**3))/(b*g**3*(a*d - b*c)**2) - 2*B*d**2*(A - 3*B)*log(x + (2*A*B*a*d**3 +
2*A*B*b*c*d**2 - 6*B**2*a*d**3 - 6*B**2*b*c*d**2 + 2*B*a**3*d**5*(A - 3*B)/
(a*d - b*c)**2 - 6*B*a**2*b*c*d**4*(A - 3*B)/(a*d - b*c)**2 + 6*B*a*b**2*c*
*2*d**3*(A - 3*B)/(a*d - b*c)**2 - 2*B*b**3*c**3*d**2*(A - 3*B)/(a*d - b*c)
**2)/(4*A*B*b*d**3 - 12*B**2*b*d**3))/(b*g**3*(a*d - b*c)**2) + (2*B**2*a*c
*d + 2*B**2*a*d**2*x - B**2*b*c**2 + B**2*b*d**2*x**2)*log(e*(c + d*x)**2/(
a + b*x)**2)**2/(2*a**4*d**2*g**3 - 4*a**3*b*c*d*g**3 + 4*a**3*b*d**2*g**3*
x + 2*a**2*b**2*c**2*g**3 - 8*a**2*b**2*c*d*g**3*x + 2*a**2*b**2*d**2*g**3*
x**2 + 4*a*b**3*c**2*g**3*x - 4*a*b**3*c*d*g**3*x**2 + 2*b**4*c**2*g**3*x**
2) + (-A*B*a*d + A*B*b*c + 3*B**2*a*d - B**2*b*c + 2*B**2*b*d*x)*log(e*(c +
 d*x)**2/(a + b*x)**2)/(a**3*b*d*g**3 - a**2*b**2*c*g**3 + 2*a**2*b**2*d*g*
*3*x - 2*a*b**3*c*g**3*x + a*b**3*d*g**3*x**2 - b**4*c*g**3*x**2) + (-A**2*
a*d + A**2*b*c + 6*A*B*a*d - 2*A*B*b*c - 14*B**2*a*d + 2*B**2*b*c + x*(4*A*
B*b*d - 12*B**2*b*d))/(2*a**3*b*d*g**3 - 2*a**2*b**2*c*g**3 + x**2*(2*a*b**
3*d*g**3 - 2*b**4*c*g**3) + x*(4*a**2*b**2*d*g**3 - 4*a*b**3*c*g**3))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{\left(bgx+ag\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^3,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2/(b*g*x + a*g)^3, x)
```

3.217 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx$

Optimal. Leaf size=407

$$\frac{4b^2B(c+dx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{9g^4(a+bx)^3(bc-ad)^3}-\frac{4Bd^3\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bg^4(bc-ad)^3}+\frac{4Bd^2(c+dx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{g^4(a+bx)(bc-ad)^3}-$$

```
[Out] (-8*B^2*d^2*(c + d*x))/((b*c - a*d)^3*g^4*(a + b*x)) + (2*b*B^2*d*(c + d*x)
^2)/((b*c - a*d)^3*g^4*(a + b*x)^2) - (8*b^2*B^2*(c + d*x)^3)/(27*(b*c - a*
d)^3*g^4*(a + b*x)^3) + (4*B^2*d^3*Log[(c + d*x)/(a + b*x)]^2)/(3*b*(b*c -
a*d)^3*g^4) + (4*B*d^2*(c + d*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/
((b*c - a*d)^3*g^4*(a + b*x)) - (2*b*B*d*(c + d*x)^2*(A + B*Log[(e*(c + d*x
)^2)/(a + b*x)^2]))/((b*c - a*d)^3*g^4*(a + b*x)^2) + (4*b^2*B*(c + d*x)^3*
(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(9*(b*c - a*d)^3*g^4*(a + b*x)^3)
 - (4*B*d^3*Log[(c + d*x)/(a + b*x)]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(3
*b*g^4*(a + b*x)^3)
```

Rubi [C] time = 1.22808, antiderivative size = 692, normalized size of antiderivative = 1.7, number of steps used = 34, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2d^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}-\frac{8B^2d^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3bg^4(bc-ad)^3}+\frac{4Bd^3\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3bg^4(bc-ad)^3}-\frac{4Bd^3\log(c+a}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] (-8*B^2)/(27*b*g^4*(a + b*x)^3) + (10*B^2*d)/(9*b*(b*c - a*d)*g^4*(a + b*x)
^2) - (44*B^2*d^2)/(9*b*(b*c - a*d)^2*g^4*(a + b*x)) - (44*B^2*d^3*Log[a +
b*x])/(9*b*(b*c - a*d)^3*g^4) + (4*B^2*d^3*Log[a + b*x]^2)/(3*b*(b*c - a*d)
^3*g^4) + (44*B^2*d^3*Log[c + d*x])/(9*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*Lo
g[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*b*(b*c - a*d)^3*g^4) + (4*
B^2*d^3*Log[c + d*x]^2)/(3*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*Log[a + b*x]*L
og[(b*(c + d*x))/(b*c - a*d)])/(3*b*(b*c - a*d)^3*g^4) + (4*B*(A + B*Log[(e
*(c + d*x)^2)/(a + b*x)^2]))/(9*b*g^4*(a + b*x)^3) - (2*B*d*(A + B*Log[(e*(
c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c - a*d)*g^4*(a + b*x)^2) + (4*B*d^2*(A
```

```
+ B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c - a*d)^2*g^4*(a + b*x)) +
(4*B*d^3*Log[a + b*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c -
 a*d)^3*g^4) - (4*B*d^3*Log[c + d*x]*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2
]))/(3*b*(b*c - a*d)^3*g^4) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(3
*b*g^4*(a + b*x)^3) - (8*B^2*d^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/
(3*b*(b*c - a*d)^3*g^4) - (8*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])
/(3*b*(b*c - a*d)^3*g^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(2B)\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g^3(a+bx)^4(c+dx)}\,dx}{3bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^4(c+dx)}\,dx}{3bg^4}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^4} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)^2(a+bx)^3} + \cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{3bg^4(a+bx)^3} + \frac{(4B)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^4}\,dx}{3g^4} - \frac{\left(4Bd^3\right)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{a+bx}\,dx}{3(bc-ad)^3g^4} + \cdots$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{9bg^4(a+bx)^3} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{4Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} + \cdots$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{9bg^4(a+bx)^3} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{4Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} + \cdots$$

$$= \frac{4B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{9bg^4(a+bx)^3} - \frac{2Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^4(a+bx)^2} + \frac{4Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)^2g^4(a+bx)} + \cdots$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+bx)\cdots}{9b(bc-ad)^3g^4}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+bx)\cdots}{9b(bc-ad)^3g^4}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+bx)\cdots}{9b(bc-ad)^3g^4}$$

$$= -\frac{8B^2}{27bg^4(a+bx)^3} + \frac{10B^2d}{9b(bc-ad)g^4(a+bx)^2} - \frac{44B^2d^2}{9b(bc-ad)^2g^4(a+bx)} - \frac{44B^2d^3\log(a+bx)\cdots}{9b(bc-ad)^3g^4}$$

Mathematica [C] time = 0.720682, size = 598, normalized size = 1.47

$$-\frac{2B\left(-18Bd^3(a+bx)^3\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+18Bd^3(a+bx)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^4,x]
```

```
[Out] -(9*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (2*B*(36*B*d^2*(a + b*x)^2
*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 9*B*d*
(a + b*x)*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b*x)^2
*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 2*B*(2*(b*c - a*d)^3 - 3*
d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2 + 6*d^3*(a + b*x)
^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 6*(b*c - a*d)^3*(A + B*
Log[(e*(c + d*x)^2)/(a + b*x)^2]) + 9*d*(b*c - a*d)^2*(a + b*x)*(A + B*Log[
(e*(c + d*x)^2)/(a + b*x)^2]) + 18*d^2*(-(b*c) + a*d)*(a + b*x)^2*(A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2]) - 18*d^3*(a + b*x)^3*Log[a + b*x]*(A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2]) + 18*d^3*(a + b*x)^3*Log[c + d*x]*(A + B*Lo
g[(e*(c + d*x)^2)/(a + b*x)^2]) - 18*B*d^3*(a + b*x)^3*(Log[a + b*x]*(Log[a
 + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-
(b*c) + a*d)]) + 18*B*d^3*(a + b*x)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/
(b*c - a*d)^3)/(27*b*g^4*(a + b*x)^3)
```

Maple [B] time = 0.075, size = 947, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x)
```

```
[Out] -1/3/b/(b*x+a)^3/g^4*A^2-8/27/b/g^4*B^2/(b*x+a)^3+4/9/b/g^4*B^2/(b*x+a)^3*l
n(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)-1/3/b/g^4*B^2/(b*x+a)^3*ln(e*(1/(b
*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)^2-10/9/b/g^4*B^2*d/(a*d-b*c)/(b*x+a)^2-44/9
/b/g^4*B^2*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(b*x+a)-22/9/b/g^4*d^3*B^2/(a^3*
d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)
^2/b^2)+1/3/b/g^4*d^3*B^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*ln(
e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)^2+2/3/b/g^4*B^2*d/(a*d-b*c)/(b*x+a)^
```

```
2*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+4/3/b/g^4*B^2*d^2/(a^2*d^2-2*a*
b*c*d+b^2*c^2)/(b*x+a)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)-2/3/b/g^4*
A*B/(b*x+a)^3*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+4/9/b/g^4*A*B*a^3*d
^3/(a*d-b*c)^3/(b*x+a)^3-4/3/g^4*A*B*a^2*d^2/(a*d-b*c)^3/(b*x+a)^3*c+4/3*b/
g^4*A*B*a*d/(a*d-b*c)^3/(b*x+a)^3*c^2+2/3/b/g^4*A*B*a^2*d^3/(a*d-b*c)^3/(b*
x+a)^2-4/3/g^4*A*B*a*d^2/(a*d-b*c)^3/(b*x+a)^2*c+4/3/b/g^4*A*B*a*d^3/(a*d-b
*c)^3/(b*x+a)+4/3/b/g^4*A*B*a*d^4/(a*d-b*c)^4*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-
d)-4/9*b^2/g^4*A*B*c^3/(a*d-b*c)^3/(b*x+a)^3+2/3*b/g^4*A*B*c^2/(a*d-b*c)^3/
(b*x+a)^2*d-4/3/g^4*A*B*c/(a*d-b*c)^3/(b*x+a)*d^2-4/3/g^4*A*B*c*d^3/(a*d-b*
c)^4*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)
```

Maxima [B] time = 1.88066, size = 2128, normalized size = 5.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x, algorithm="ma
xima")
```

```
[Out] 2/27*(3*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11*a^2*d^2 - 3*(b^2*c*d -
 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2)*g^4*x^3 + 3*(a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^4*c^2 - 2*a^3*b^3*c*d +
 a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*g^4) + 6*d^
3*log(b*x + a)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4
) - 6*d^3*log(d*x + c)/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*
d^3)*g^4))*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2
*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2)) - (4*b^3*c^3 - 27*a*b^2*c^
2*d + 108*a^2*b*c*d^2 - 85*a^3*d^3 + 66*(b^3*c*d^2 - a*b^2*d^3)*x^2 - 18*(b
^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a)^2 - 18
*(b^3*d^3*x^3 + 3*a*b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(d*x + c)^2 -
 3*(5*b^3*c^2*d - 54*a*b^2*c*d^2 + 49*a^2*b*d^3)*x + 66*(b^3*d^3*x^3 + 3*a*
b^2*d^3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a) - 6*(11*b^3*d^3*x^3 + 3
3*a*b^2*d^3*x^2 + 33*a^2*b*d^3*x + 11*a^3*d^3 - 6*(b^3*d^3*x^3 + 3*a*b^2*d^
3*x^2 + 3*a^2*b*d^3*x + a^3*d^3)*log(b*x + a))*log(d*x + c))/(a^3*b^4*c^3*g
^4 - 3*a^4*b^3*c^2*d*g^4 + 3*a^5*b^2*c*d^2*g^4 - a^6*b*d^3*g^4 + (b^7*c^3*g
^4 - 3*a*b^6*c^2*d*g^4 + 3*a^2*b^5*c*d^2*g^4 - a^3*b^4*d^3*g^4)*x^3 + 3*(a*
b^6*c^3*g^4 - 3*a^2*b^5*c^2*d*g^4 + 3*a^3*b^4*c*d^2*g^4 - a^4*b^3*d^3*g^4)*
x^2 + 3*(a^2*b^5*c^3*g^4 - 3*a^3*b^4*c^2*d*g^4 + 3*a^4*b^3*c*d^2*g^4 - a^5*
b^2*d^3*g^4)*x))*B^2 + 2/9*A*B*((6*b^2*d^2*x^2 + 2*b^2*c^2 - 7*a*b*c*d + 11
*a^2*d^2 - 3*(b^2*c*d - 5*a*b*d^2)*x)/((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2
)*g^4*x^3 + 3*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*g^4*x^2 + 3*(a^2*b^
```

```
4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*g^4*x + (a^3*b^3*c^2 - 2*a^4*b^2*c*d +
 a^5*b*d^2)*g^4) - 3*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b
^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))/(b^4*g^4*x^3 + 3
*a*b^3*g^4*x^2 + 3*a^2*b^2*g^4*x + a^3*b*g^4) + 6*d^3*log(b*x + a)/((b^4*c^
3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4) - 6*d^3*log(d*x + c)/
((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*g^4)) - 1/3*B^2*lo
g(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2)
 + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^
2*b^2*g^4*x + a^3*b*g^4) - 1/3*A^2/(b^4*g^4*x^3 + 3*a*b^3*g^4*x^2 + 3*a^2*b
^2*g^4*x + a^3*b*g^4)
```

Fricas [A] time = 1.12827, size = 1474, normalized size = 3.62

$$-\frac{\left(9\,A^2-12\,AB+8\,B^2\right)b^3c^3-27\left(A^2-2\,AB+2\,B^2\right)ab^2c^2d+27\left(A^2-4\,AB+8\,B^2\right)a^2bcd^2-\left(9\,A^2-66\,AB+170\,B^2\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x, algorithm="fr
icas")
```

```
[Out] -1/27*((9*A^2 - 12*A*B + 8*B^2)*b^3*c^3 - 27*(A^2 - 2*A*B + 2*B^2)*a*b^2*c^
2*d + 27*(A^2 - 4*A*B + 8*B^2)*a^2*b*c*d^2 - (9*A^2 - 66*A*B + 170*B^2)*a^3
*d^3 - 12*((3*A*B - 11*B^2)*b^3*c*d^2 - (3*A*B - 11*B^2)*a*b^2*d^3)*x^2 + 9
*(B^2*b^3*d^3*x^3 + 3*B^2*a*b^2*d^3*x^2 + 3*B^2*a^2*b*d^3*x + B^2*b^3*c^3 -
 3*B^2*a*b^2*c^2*d + 3*B^2*a^2*b*c*d^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)
/(b^2*x^2 + 2*a*b*x + a^2))^2 + 6*((3*A*B - 5*B^2)*b^3*c^2*d - 18*(A*B - 3*
B^2)*a*b^2*c*d^2 + (15*A*B - 49*B^2)*a^2*b*d^3)*x + 6*((3*A*B - 11*B^2)*b^3
*d^3*x^3 + (3*A*B - 2*B^2)*b^3*c^3 - 9*(A*B - B^2)*a*b^2*c^2*d + 9*(A*B - 2
*B^2)*a^2*b*c*d^2 - 3*(2*B^2*b^3*c*d^2 - 3*(A*B - 3*B^2)*a*b^2*d^3)*x^2 + 3
*(B^2*b^3*c^2*d - 6*B^2*a*b^2*c*d^2 + 3*(A*B - 2*B^2)*a^2*b*d^3)*x)*log((d^
2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^7*c^3 - 3*a*b^
6*c^2*d + 3*a^2*b^5*c*d^2 - a^3*b^4*d^3)*g^4*x^3 + 3*(a*b^6*c^3 - 3*a^2*b^5
*c^2*d + 3*a^3*b^4*c*d^2 - a^4*b^3*d^3)*g^4*x^2 + 3*(a^2*b^5*c^3 - 3*a^3*b^
4*c^2*d + 3*a^4*b^3*c*d^2 - a^5*b^2*d^3)*g^4*x + (a^3*b^4*c^3 - 3*a^4*b^3*c
^2*d + 3*a^5*b^2*c*d^2 - a^6*b*d^3)*g^4)
```

Sympy [B] time = 35.508, size = 1561, normalized size = 3.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**4,x)
```

```
[Out] 4*B*d**3*(3*A - 11*B)*log(x + (12*A*B*a*d**4 + 12*A*B*b*c*d**3 - 44*B**2*a*
d**4 - 44*B**2*b*c*d**3 - 4*B*a**4*d**7*(3*A - 11*B)/(a*d - b*c)**3 + 16*B*
a**3*b*c*d**6*(3*A - 11*B)/(a*d - b*c)**3 - 24*B*a**2*b**2*c**2*d**5*(3*A -
 11*B)/(a*d - b*c)**3 + 16*B*a*b**3*c**3*d**4*(3*A - 11*B)/(a*d - b*c)**3 -
 4*B*b**4*c**4*d**3*(3*A - 11*B)/(a*d - b*c)**3)/(24*A*B*b*d**4 - 88*B**2*b
*d**4))/(9*b*g**4*(a*d - b*c)**3) - 4*B*d**3*(3*A - 11*B)*log(x + (12*A*B*a
*d**4 + 12*A*B*b*c*d**3 - 44*B**2*a*d**4 - 44*B**2*b*c*d**3 + 4*B*a**4*d**7
*(3*A - 11*B)/(a*d - b*c)**3 - 16*B*a**3*b*c*d**6*(3*A - 11*B)/(a*d - b*c)*
*3 + 24*B*a**2*b**2*c**2*d**5*(3*A - 11*B)/(a*d - b*c)**3 - 16*B*a*b**3*c**
3*d**4*(3*A - 11*B)/(a*d - b*c)**3 + 4*B*b**4*c**4*d**3*(3*A - 11*B)/(a*d -
 b*c)**3)/(24*A*B*b*d**4 - 88*B**2*b*d**4))/(9*b*g**4*(a*d - b*c)**3) + (3*
B**2*a**2*c*d**2 + 3*B**2*a**2*d**3*x - 3*B**2*a*b*c**2*d + 3*B**2*a*b*d**3
*x**2 + B**2*b**2*c**3 + B**2*b**2*d**3*x**3)*log(e*(c + d*x)**2/(a + b*x)*
*2)**2/(3*a**6*d**3*g**4 - 9*a**5*b*c*d**2*g**4 + 9*a**5*b*d**3*g**4*x + 9*
a**4*b**2*c**2*d*g**4 - 27*a**4*b**2*c*d**2*g**4*x + 9*a**4*b**2*d**3*g**4*
x**2 - 3*a**3*b**3*c**3*g**4 + 27*a**3*b**3*c**2*d*g**4*x - 27*a**3*b**3*c*
d**2*g**4*x**2 + 3*a**3*b**3*d**3*g**4*x**3 - 9*a**2*b**4*c**3*g**4*x + 27*
a**2*b**4*c**2*d*g**4*x**2 - 9*a**2*b**4*c*d**2*g**4*x**3 - 9*a*b**5*c**3*g
**4*x**2 + 9*a*b**5*c**2*d*g**4*x**3 - 3*b**6*c**3*g**4*x**3) + (-6*A*B*a**
2*d**2 + 12*A*B*a*b*c*d - 6*A*B*b**2*c**2 + 22*B**2*a**2*d**2 - 14*B**2*a*b
*c*d + 30*B**2*a*b*d**2*x + 4*B**2*b**2*c**2 - 6*B**2*b**2*c*d*x + 12*B**2*
b**2*d**2*x**2)*log(e*(c + d*x)**2/(a + b*x)**2)/(9*a**5*b*d**2*g**4 - 18*a
**4*b**2*c*d*g**4 + 27*a**4*b**2*d**2*g**4*x + 9*a**3*b**3*c**2*g**4 - 54*a
**3*b**3*c*d*g**4*x + 27*a**3*b**3*d**2*g**4*x**2 + 27*a**2*b**4*c**2*g**4*
x - 54*a**2*b**4*c*d*g**4*x**2 + 9*a**2*b**4*d**2*g**4*x**3 + 27*a*b**5*c**
2*g**4*x**2 - 18*a*b**5*c*d*g**4*x**3 + 9*b**6*c**2*g**4*x**3) + (-9*A**2*a
**2*d**2 + 18*A**2*a*b*c*d - 9*A**2*b**2*c**2 + 66*A*B*a**2*d**2 - 42*A*B*a
*b*c*d + 12*A*B*b**2*c**2 - 170*B**2*a**2*d**2 + 46*B**2*a*b*c*d - 8*B**2*b
**2*c**2 + x**2*(36*A*B*b**2*d**2 - 132*B**2*b**2*d**2) + x*(90*A*B*a*b*d**
2 - 18*A*B*b**2*c*d - 294*B**2*a*b*d**2 + 30*B**2*b**2*c*d))/(27*a**5*b*d**
2*g**4 - 54*a**4*b**2*c*d*g**4 + 27*a**3*b**3*c**2*g**4 + x**3*(27*a**2*b**
4*d**2*g**4 - 54*a*b**5*c*d*g**4 + 27*b**6*c**2*g**4) + x**2*(81*a**3*b**3*
d**2*g**4 - 162*a**2*b**4*c*d*g**4 + 81*a*b**5*c**2*g**4) + x*(81*a**4*b**2
*d**2*g**4 - 162*a**3*b**3*c*d*g**4 + 81*a**2*b**4*c**2*g**4))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}{(bgx+ag)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^4,x, algorithm="gi
ac")
```

```
[Out] integrate((B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2/(b*g*x + a*g)^4, x)
```

3.218 $\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx$

Optimal. Leaf size=501

$$-\frac{4b^2Bd(c+dx)^3\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{3g^5(a+bx)^3(bc-ad)^4}+\frac{b^3B(c+dx)^4\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{4g^5(a+bx)^4(bc-ad)^4}+\frac{Bd^4\log\left(\frac{c+dx}{a+bx}\right)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^5(bc-ad)^4}-$$

```
[Out] (8*B^2*d^3*(c + d*x))/((b*c - a*d)^4*g^5*(a + b*x)) - (3*b*B^2*d^2*(c + d*x
)^2)/((b*c - a*d)^4*g^5*(a + b*x)^2) + (8*b^2*B^2*d*(c + d*x)^3)/(9*(b*c -
a*d)^4*g^5*(a + b*x)^3) - (b^3*B^2*(c + d*x)^4)/(8*(b*c - a*d)^4*g^5*(a + b
*x)^4) - (B^2*d^4*Log[(c + d*x)/(a + b*x)]^2)/(b*(b*c - a*d)^4*g^5) - (4*B*
d^3*(c + d*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/((b*c - a*d)^4*g^5*
(a + b*x)) + (3*b*B*d^2*(c + d*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]
))/((b*c - a*d)^4*g^5*(a + b*x)^2) - (4*b^2*B*d*(c + d*x)^3*(A + B*Log[(e*(
c + d*x)^2)/(a + b*x)^2]))/(3*(b*c - a*d)^4*g^5*(a + b*x)^3) + (b^3*B*(c +
d*x)^4*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(4*(b*c - a*d)^4*g^5*(a +
b*x)^4) + (B*d^4*Log[(c + d*x)/(a + b*x)]*(A + B*Log[(e*(c + d*x)^2)/(a + b
*x)^2]))/(b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2
/(4*b*g^5*(a + b*x)^4)
```

Rubi [C] time = 1.42886, antiderivative size = 758, normalized size of antiderivative = 1.51, number of steps used = 38, number of rules used = 11, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.324, Rules used = {2525, 12, 2528, 44, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2B^2d^4\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{bg^5(bc-ad)^4}+\frac{2B^2d^4\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{bg^5(bc-ad)^4}-\frac{Bd^4\log(a+bx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}{bg^5(bc-ad)^4}+\frac{Bd^4\log(c+dx)\left(B\right.}{bg^5(bc}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] -B^2/(8*b*g^5*(a + b*x)^4) + (7*B^2*d)/(18*b*(b*c - a*d)*g^5*(a + b*x)^3) -
 (13*B^2*d^2)/(12*b*(b*c - a*d)^2*g^5*(a + b*x)^2) + (25*B^2*d^3)/(6*b*(b*c
 - a*d)^3*g^5*(a + b*x)) + (25*B^2*d^4*Log[a + b*x])/(6*b*(b*c - a*d)^4*g^5
) - (B^2*d^4*Log[a + b*x]^2)/(b*(b*c - a*d)^4*g^5) - (25*B^2*d^4*Log[c + d*
x])/(6*b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d))]*
Log[c + d*x])/(b*(b*c - a*d)^4*g^5) - (B^2*d^4*Log[c + d*x]^2)/(b*(b*c - a*
d)^4*g^5) + (2*B^2*d^4*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(b*(b*c
```

```
 - a*d)^4*g^5) + (B*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(4*b*g^5*(a +
 b*x)^4) - (B*d*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(3*b*(b*c - a*d)*
g^5*(a + b*x)^3) + (B*d^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(2*b*(b
*c - a*d)^2*g^5*(a + b*x)^2) - (B*d^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^
2]))/(b*(b*c - a*d)^3*g^5*(a + b*x)) - (B*d^4*Log[a + b*x]*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^4*g^5) + (B*d^4*Log[c + d*x]*(A +
B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))/(b*(b*c - a*d)^4*g^5) - (A + B*Log[(e*
(c + d*x)^2)/(a + b*x)^2])^2/(4*b*g^5*(a + b*x)^4) + (2*B^2*d^4*PolyLog[2,
-((d*(a + b*x))/(b*c - a*d))])/(b*(b*c - a*d)^4*g^5) + (2*B^2*d^4*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])/(b*(b*c - a*d)^4*g^5)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
```

```
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{(ag+bgx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{2(bc-ad)\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{g^4(a+bx)^5(c+dx)}\,dx}{2bg}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^5(c+dx)}\,dx}{bg^5}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{(B(bc-ad))\int \left(\frac{b\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)(a+bx)^5} - \frac{bd\left(-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{(bc-ad)^2(a+bx)^4} + \cdots\right.}{\cdots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}{4bg^5(a+bx)^4} + \frac{B\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{(a+bx)^5}\,dx}{g^5} + \frac{\left(Bd^4\right)\int \frac{-A-B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{a+bx}\,dx}{(bc-ad)^4g^5} - \cdots$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4bg^5(a+bx)^4} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2} - \cdots$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4bg^5(a+bx)^4} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2} - \cdots$$

$$= \frac{B\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{4bg^5(a+bx)^4} - \frac{Bd\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{3b(bc-ad)g^5(a+bx)^3} + \frac{Bd^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}{2b(bc-ad)^2g^5(a+bx)^2} - \cdots$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d\cdots}{6b(bc-ad)^3g\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d\cdots}{6b(bc-ad)^3g\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d\cdots}{6b(bc-ad)^3g\cdots}$$

$$= -\frac{B^2}{8bg^5(a+bx)^4} + \frac{7B^2d}{18b(bc-ad)g^5(a+bx)^3} - \frac{13B^2d^2}{12b(bc-ad)^2g^5(a+bx)^2} + \frac{25B^2d\cdots}{6b(bc-ad)^3g\cdots}$$

Mathematica [C] time = 0.987847, size = 762, normalized size = 1.52

$$\frac{B\left(-72Bd^4(a+bx)^4\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+72Bd^4(a+bx)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2/(a*g + b*g*x)^5,x]
```

```
[Out] (-18*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2 + (B*(144*B*d^3*(a + b*x)^3
*(b*c - a*d + d*(a + b*x)*Log[a + b*x] - d*(a + b*x)*Log[c + d*x]) - 36*B*d
^2*(a + b*x)^2*((b*c - a*d)^2 + 2*d*(-(b*c) + a*d)*(a + b*x) - 2*d^2*(a + b
*x)^2*Log[a + b*x] + 2*d^2*(a + b*x)^2*Log[c + d*x]) + 8*B*d*(a + b*x)*(2*(
b*c - a*d)^3 - 3*d*(b*c - a*d)^2*(a + b*x) + 6*d^2*(b*c - a*d)*(a + b*x)^2
+ 6*d^3*(a + b*x)^3*Log[a + b*x] - 6*d^3*(a + b*x)^3*Log[c + d*x]) - 3*B*(3
*(b*c - a*d)^4 + 4*d*(-(b*c) + a*d)^3*(a + b*x) + 6*d^2*(b*c - a*d)^2*(a +
b*x)^2 + 12*d^3*(-(b*c) + a*d)*(a + b*x)^3 - 12*d^4*(a + b*x)^4*Log[a + b*x
] + 12*d^4*(a + b*x)^4*Log[c + d*x]) + 18*(b*c - a*d)^4*(A + B*Log[(e*(c +
d*x)^2)/(a + b*x)^2]) + 24*d*(-(b*c) + a*d)^3*(a + b*x)*(A + B*Log[(e*(c +
d*x)^2)/(a + b*x)^2]) + 36*d^2*(b*c - a*d)^2*(a + b*x)^2*(A + B*Log[(e*(c +
 d*x)^2)/(a + b*x)^2]) + 72*d^3*(-(b*c) + a*d)*(a + b*x)^3*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]) - 72*d^4*(a + b*x)^4*Log[a + b*x]*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]) + 72*d^4*(a + b*x)^4*Log[c + d*x]*(A + B*Log[(e*(c
 + d*x)^2)/(a + b*x)^2]) - 72*B*d^4*(a + b*x)^4*(Log[a + b*x]*(Log[a + b*x]
 - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) +
 a*d)]) + 72*B*d^4*(a + b*x)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[
c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b*c -
a*d)^4)/(72*b*g^5*(a + b*x)^4)
```

Maple [B] time = 0.078, size = 1285, normalized size = 2.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x)
```

```
[Out] 1/b/g^5*A*B*a*d^4/(a*d-b*c)^4/(b*x+a)+1/2/b/g^5*A*B*a^2*d^4/(a*d-b*c)^4/(b*
x+a)^2-1/3*b^2/g^5*A*B*c^3/(a*d-b*c)^4/(b*x+a)^3*d+1/b/g^5*A*B*a*d^5/(a*d-b
*c)^5*ln(1/(b*x+a)*a*d-b*c/(b*x+a)-d)+1/3/b/g^5*B^2*d/(a*d-b*c)/(b*x+a)^3*l
```

```
n(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+1/2/b/g^5*B^2*d^2/(a^2*d^2-2*a*b*c
*d+b^2*c^2)/(b*x+a)^2*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+1/b/g^5*d^3
*B^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(b*x+a)*ln(e*(1/(b*x+a)*
a*d-b*c/(b*x+a)-d)^2/b^2)-1/g^5*A*B*c*d^4/(a*d-b*c)^5*ln(1/(b*x+a)*a*d-b*c/
(b*x+a)-d)+1/4*b^3/g^5*A*B*c^4/(a*d-b*c)^4/(b*x+a)^4-1/g^5*A*B*c/(a*d-b*c)^
4/(b*x+a)*d^3-1/g^5*A*B*a^2*d^3/(a*d-b*c)^4/(b*x+a)^3*c+1/4/b/g^5*B^2/(b*x+
a)^4*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)-1/4/b/(b*x+a)^4/g^5*A^2-1/8/
b/g^5*B^2/(b*x+a)^4-1/g^5*A*B*a*d^3/(a*d-b*c)^4/(b*x+a)^2*c-1/g^5*A*B*a^3*d
^3/(a*d-b*c)^4/(b*x+a)^4*c+1/2*b/g^5*A*B*c^2/(a*d-b*c)^4/(b*x+a)^2*d^2+1/3/
b/g^5*A*B*a^3*d^4/(a*d-b*c)^4/(b*x+a)^3+1/4/b/g^5*A*B*a^4*d^4/(a*d-b*c)^4/(
b*x+a)^4-1/4/b/g^5*B^2/(b*x+a)^4*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)^
2+b/g^5*A*B*a*d^2/(a*d-b*c)^4/(b*x+a)^3*c^2+3/2*b/g^5*A*B*a^2*d^2/(a*d-b*c)
^4/(b*x+a)^4*c^2-b^2/g^5*A*B*a*d/(a*d-b*c)^4/(b*x+a)^4*c^3-25/6/b/g^5*d^3*B
^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/(b*x+a)-25/12/b/g^5*d^4*B^
2/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln(e*(1/(
b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)+1/4/b/g^5*d^4*B^2/(a^4*d^4-4*a^3*b*c*d^3+6
*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^
2/b^2)^2-1/2/b/g^5*A*B/(b*x+a)^4*ln(e*(1/(b*x+a)*a*d-b*c/(b*x+a)-d)^2/b^2)-
13/12/b/g^5*B^2*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(b*x+a)^2-7/18/b/g^5*B^2*d/
(a*d-b*c)/(b*x+a)^3
```

Maxima [B] time = 2.398, size = 3075, normalized size = 6.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x, algorithm="ma
xima")
```

```
[Out] -1/72*(6*((12*b^3*d^3*x^3 - 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 2
5*a^3*d^3 - 6*(b^3*c*d^2 - 7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2
+ 13*a^2*b*d^3)*x)/((b^8*c^3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^
3)*g^5*x^4 + 4*(a*b^7*c^3 - 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3
)*g^5*x^3 + 6*(a^2*b^6*c^3 - 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^
3)*g^5*x^2 + 4*(a^3*b^5*c^3 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d
^3)*g^5*x + (a^4*b^4*c^3 - 3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g
^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4
*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c)/((b^5*c^4 - 4*a*b^4*
c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5))*log(d^2*e*x^
2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(
b^2*x^2 + 2*a*b*x + a^2)) + (9*b^4*c^4 - 64*a*b^3*c^3*d + 216*a^2*b^2*c^2*d
```

```
^2 - 576*a^3*b*c*d^3 + 415*a^4*d^4 - 300*(b^4*c*d^3 - a*b^3*d^4)*x^3 + 6*(1
3*b^4*c^2*d^2 - 176*a*b^3*c*d^3 + 163*a^2*b^2*d^4)*x^2 + 72*(b^4*d^4*x^4 +
4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a)
^2 + 72*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x
+ a^4*d^4)*log(d*x + c)^2 - 4*(7*b^4*c^3*d - 60*a*b^3*c^2*d^2 + 324*a^2*b^2
*c*d^3 - 271*a^3*b*d^4)*x - 300*(b^4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*
d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*log(b*x + a) + 12*(25*b^4*d^4*x^4 + 100*
a*b^3*d^4*x^3 + 150*a^2*b^2*d^4*x^2 + 100*a^3*b*d^4*x + 25*a^4*d^4 - 12*(b^
4*d^4*x^4 + 4*a*b^3*d^4*x^3 + 6*a^2*b^2*d^4*x^2 + 4*a^3*b*d^4*x + a^4*d^4)*
log(b*x + a))*log(d*x + c))/(a^4*b^5*c^4*g^5 - 4*a^5*b^4*c^3*d*g^5 + 6*a^6*
b^3*c^2*d^2*g^5 - 4*a^7*b^2*c*d^3*g^5 + a^8*b*d^4*g^5 + (b^9*c^4*g^5 - 4*a*
b^8*c^3*d*g^5 + 6*a^2*b^7*c^2*d^2*g^5 - 4*a^3*b^6*c*d^3*g^5 + a^4*b^5*d^4*g
^5)*x^4 + 4*(a*b^8*c^4*g^5 - 4*a^2*b^7*c^3*d*g^5 + 6*a^3*b^6*c^2*d^2*g^5 -
4*a^4*b^5*c*d^3*g^5 + a^5*b^4*d^4*g^5)*x^3 + 6*(a^2*b^7*c^4*g^5 - 4*a^3*b^6
*c^3*d*g^5 + 6*a^4*b^5*c^2*d^2*g^5 - 4*a^5*b^4*c*d^3*g^5 + a^6*b^3*d^4*g^5)
*x^2 + 4*(a^3*b^6*c^4*g^5 - 4*a^4*b^5*c^3*d*g^5 + 6*a^5*b^4*c^2*d^2*g^5 - 4
*a^6*b^3*c*d^3*g^5 + a^7*b^2*d^4*g^5)*x))*B^2 - 1/12*A*B*((12*b^3*d^3*x^3 -
 3*b^3*c^3 + 13*a*b^2*c^2*d - 23*a^2*b*c*d^2 + 25*a^3*d^3 - 6*(b^3*c*d^2 -
7*a*b^2*d^3)*x^2 + 4*(b^3*c^2*d - 5*a*b^2*c*d^2 + 13*a^2*b*d^3)*x)/((b^8*c^
3 - 3*a*b^7*c^2*d + 3*a^2*b^6*c*d^2 - a^3*b^5*d^3)*g^5*x^4 + 4*(a*b^7*c^3 -
 3*a^2*b^6*c^2*d + 3*a^3*b^5*c*d^2 - a^4*b^4*d^3)*g^5*x^3 + 6*(a^2*b^6*c^3
- 3*a^3*b^5*c^2*d + 3*a^4*b^4*c*d^2 - a^5*b^3*d^3)*g^5*x^2 + 4*(a^3*b^5*c^3
 - 3*a^4*b^4*c^2*d + 3*a^5*b^3*c*d^2 - a^6*b^2*d^3)*g^5*x + (a^4*b^4*c^3 -
3*a^5*b^3*c^2*d + 3*a^6*b^2*c*d^2 - a^7*b*d^3)*g^5) + 6*log(d^2*e*x^2/(b^2*
x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2
 + 2*a*b*x + a^2))/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a
^3*b^2*g^5*x + a^4*b*g^5) + 12*d^4*log(b*x + a)/((b^5*c^4 - 4*a*b^4*c^3*d +
 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*g^5) - 12*d^4*log(d*x + c
)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d
^4)*g^5)) - 1/4*B^2*log(d^2*e*x^2/(b^2*x^2 + 2*a*b*x + a^2) + 2*c*d*e*x/(b^
2*x^2 + 2*a*b*x + a^2) + c^2*e/(b^2*x^2 + 2*a*b*x + a^2))^2/(b^5*g^5*x^4 +
4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^4*b*g^5) - 1/4*A^
2/(b^5*g^5*x^4 + 4*a*b^4*g^5*x^3 + 6*a^2*b^3*g^5*x^2 + 4*a^3*b^2*g^5*x + a^
4*b*g^5)
```

Fricas [B] time = 1.19125, size = 2229, normalized size = 4.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x, algorithm="fr
icas")
```

```
[Out] -1/72*(9*(2*A^2 - 2*A*B + B^2)*b^4*c^4 - 8*(9*A^2 - 12*A*B + 8*B^2)*a*b^3*c
^3*d + 108*(A^2 - 2*A*B + 2*B^2)*a^2*b^2*c^2*d^2 - 72*(A^2 - 4*A*B + 8*B^2)
*a^3*b*c*d^3 + (18*A^2 - 150*A*B + 415*B^2)*a^4*d^4 + 12*((6*A*B - 25*B^2)*
b^4*c*d^3 - (6*A*B - 25*B^2)*a*b^3*d^4)*x^3 - 6*((6*A*B - 13*B^2)*b^4*c^2*d
^2 - 16*(3*A*B - 11*B^2)*a*b^3*c*d^3 + (42*A*B - 163*B^2)*a^2*b^2*d^4)*x^2
- 18*(B^2*b^4*d^4*x^4 + 4*B^2*a*b^3*d^4*x^3 + 6*B^2*a^2*b^2*d^4*x^2 + 4*B^2
*a^3*b*d^4*x - B^2*b^4*c^4 + 4*B^2*a*b^3*c^3*d - 6*B^2*a^2*b^2*c^2*d^2 + 4*
B^2*a^3*b*c*d^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a
^2))^2 + 4*((6*A*B - 7*B^2)*b^4*c^3*d - 12*(3*A*B - 5*B^2)*a*b^3*c^2*d^2 +
108*(A*B - 3*B^2)*a^2*b^2*c*d^3 - (78*A*B - 271*B^2)*a^3*b*d^4)*x - 6*((6*A
*B - 25*B^2)*b^4*d^4*x^4 - 3*(2*A*B - B^2)*b^4*c^4 + 8*(3*A*B - 2*B^2)*a*b^
3*c^3*d - 36*(A*B - B^2)*a^2*b^2*c^2*d^2 + 24*(A*B - 2*B^2)*a^3*b*c*d^3 - 4
*(3*B^2*b^4*c*d^3 - 2*(3*A*B - 11*B^2)*a*b^3*d^4)*x^3 + 6*(B^2*b^4*c^2*d^2
- 8*B^2*a*b^3*c*d^3 + 6*(A*B - 3*B^2)*a^2*b^2*d^4)*x^2 - 4*(B^2*b^4*c^3*d -
 6*B^2*a*b^3*c^2*d^2 + 18*B^2*a^2*b^2*c*d^3 - 6*(A*B - 2*B^2)*a^3*b*d^4)*x)
*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)))/((b^9*c^4
- 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*g^5*x^
4 + 4*(a*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 +
a^5*b^4*d^4)*g^5*x^3 + 6*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2
 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*g^5*x^2 + 4*(a^3*b^6*c^4 - 4*a^4*b^5*c^3*
d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4)*g^5*x + (a^4*b^5*c^4
 - 4*a^5*b^4*c^3*d + 6*a^6*b^3*c^2*d^2 - 4*a^7*b^2*c*d^3 + a^8*b*d^4)*g^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2/(b*g*x+a*g)**5,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.68893, size = 1172, normalized size = 2.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2/(b*g*x+a*g)^5,x, algorithm="gi
ac")

[Out] 1/4*(B^2*d^4/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a
^3*b^2*c*d^3*g^5 + a^4*b*d^4*g^5) - B^2/((b*g*x + a*g)^4*b*g))*log((b^2*c^2
*g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x +
 a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2)^2 -
 1/12*(12*B^2*d^3/((b^3*c^3*g^3 - 3*a*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a
^3*d^3*g^3)*(b*g*x + a*g)*b*g) - 6*B^2*d^2/((b^2*c^2*g - 2*a*b*c*d*g + a^2*
d^2*g)*(b*g*x + a*g)^2*b*g^2) + 4*B^2*d/((b*g*x + a*g)^3*(b*c - a*d)*b*g^2)
 + 3*(2*A*B*b^3*g^3 + B^2*b^3*g^3)/((b*g*x + a*g)^4*b^4*g^4))*log((b^2*c^2*
g^2/(b*g*x + a*g)^2 - 2*a*b*c*d*g^2/(b*g*x + a*g)^2 + a^2*d^2*g^2/(b*g*x +
a*g)^2 + 2*b*c*d*g/(b*g*x + a*g) - 2*a*d^2*g/(b*g*x + a*g) + d^2)/b^2) + 1/
6*(6*A*B*d^4 - 19*B^2*d^4)*log(-b*c*g/(b*g*x + a*g) + a*d*g/(b*g*x + a*g) -
 d)/(b^5*c^4*g^5 - 4*a*b^4*c^3*d*g^5 + 6*a^2*b^3*c^2*d^2*g^5 - 4*a^3*b^2*c*
d^3*g^5 + a^4*b*d^4*g^5) - 1/6*(6*A*B*d^3 - 19*B^2*d^3)/((b^3*c^3*g^3 - 3*a
*b^2*c^2*d*g^3 + 3*a^2*b*c*d^2*g^3 - a^3*d^3*g^3)*(b*g*x + a*g)*b*g) + 1/12
*(6*A*B*b*d^2 - 7*B^2*b*d^2)/((b^2*c^2*g - 2*a*b*c*d*g + a^2*d^2*g)*(b*g*x
+ a*g)^2*b^2*g^2) - 1/18*(6*A*B*b^2*d*g - B^2*b^2*d*g)/((b*g*x + a*g)^3*(b*
c - a*d)*b^3*g^3) - 1/8*(2*A^2*b^3*g^3 + 2*A*B*b^3*g^3 + B^2*b^3*g^3)/((b*g
*x + a*g)^4*b^4*g^4)
```

3.219 $\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Rubi [A] time = 0.202201, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-1), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x] + b^2*g^2*D
efer[Int][x^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Rubi steps

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx = \int \left(\frac{a^2g^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{2abg^2x}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{b^2g^2x^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\right)dx$$
$$=\left(a^2g^2\right)\int \frac{1}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx+\left(2abg^2\right)\int \frac{x}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx+\left(b^2g^2\right)\int \frac{}{A+B\,\mathrm{lo}}$$

Mathematica [A] time = 0.156989, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Maple [A] time = 1.127, size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^2\left(A+B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bgx+ag\right)^2}{B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B*log((d^2*e*x^2 + 2*c*d*e*
x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

3.220 $\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{ag+bgx}{B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Rubi [A] time = 0.100778, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-1), x] + b*g*Defe
r[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} dx &= \int \left(\frac{ag}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}+\frac{bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}\right) dx\\
&= (ag)\int \frac{1}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} dx+(bg)\int \frac{x}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} dx
\end{aligned}$$

Mathematica [A] time = 0.115382, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]),x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]), x]
```

Maple [A] time = 0.962, size = 0, normalized size = 0.

$$\int (bgx + ag)\left(A + B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B\log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxima
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bgx + ag}{B\log\left(\frac{d^2ex^2 + 2\,cdex + c^2e}{b^2x^2 + 2\,abx + a^2}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fricas
")
```

```
[Out] integral((b*g*x + a*g)/(B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*
a*b*x + a^2)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx + ag}{B \log\left(\frac{(dx+c)^2 e}{(bx+a)^2}\right) + A}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)^2*e/(b*x + a)^2) + A), x)
```

3.221 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi [A] time = 0.0731757, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.0703185, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Maple [A] time = 1.298, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="maxi
ma")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Abgx+Aag+(Bbgx+Bag)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fric
as")
```

```
[Out] integral(1/(A*b*g*x + A*a*g + (B*b*g*x + B*a*g)*log((d^2*e*x^2 + 2*c*d*e*x
+ c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="giac
")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

3.222 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$

Optimal. Leaf size=91

$$-\frac{e^{-\frac{A}{2B}}(c+dx)\mathrm{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{2Bg^2(a+bx)(bc-ad)\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}$$

```
[Out] -((c + d*x)*ExpIntegralEi[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*B)])/
(2*B*(b*c - a*d)*E^(A/(2*B))*g^2*(a + b*x)*Sqrt[(e*(c + d*x)^2)/(a + b*x)^2
])
```

Rubi [F] time = 0.0872545, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.076942, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Maple [F] time = 1.228, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}}\left(A+B\ln\left(\frac{e\left(dx+c\right)^{2}}{\left(bx+a\right)^{2}}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Ab^{2}g^{2}x^{2}+2\,Aabg^{2}x+Aa^{2}g^{2}+\left(Bb^{2}g^{2}x^{2}+2\,Babg^{2}x+Ba^{2}g^{2}\right)\log\left(\frac{d^{2}ex^{2}+2\,cdex+c^{2}e}{b^{2}x^{2}+2\,abx+a^{2}}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^2*g^2*x^2 + 2*A*a*b*g^2*x + A*a^2*g^2 + (B*b^2*g^2*x^2 + 2*
B*a*b*g^2*x + B*a^2*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a
*b*x + a^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^2\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

3.223 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$

Optimal. Leaf size=151

$$\frac{de^{-\frac{A}{2B}}(c+dx)\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{2Bg^3(a+bx)(bc-ad)^2\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}-\frac{be^{-\frac{A}{B}}\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{B}\right)}{2Beg^3(bc-ad)^2}$$

```
[Out] (d*(c + d*x)*ExpIntegralEi[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*B)])
/(2*B*(b*c - a*d)^2*E^(A/(2*B))*g^3*(a + b*x)*Sqrt[(e*(c + d*x)^2)/(a + b*x
)^2]) - (b*ExpIntegralEi[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/B])/(2*B*
(b*c - a*d)^2*e*E^(A/B)*g^3)
```

Rubi [F] time = 0.0736238, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Mathematica [F] time = 0.0806264, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])), x]
```

Maple [F] time = 1.371, size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^3}\left(A+B\ln\left(\frac{e(dx+c)^2}{(bx+a)^2}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)^3\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="ma
xima")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ab^3g^3x^3+3\,Aab^2g^3x^2+3\,Aa^2bg^3x+Aa^3g^3+\left(Bb^3g^3x^3+3\,Bab^2g^3x^2+3\,Ba^2bg^3x+Ba^3g^3\right)\log\left(\frac{d^2ex^2+2\,cdex+c}{b^2x^2+2\,abx+a}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="fr
icas")
```

```
[Out] integral(1/(A*b^3*g^3*x^3 + 3*A*a*b^2*g^3*x^2 + 3*A*a^2*b*g^3*x + A*a^3*g^3
 + (B*b^3*g^3*x^3 + 3*B*a*b^2*g^3*x^2 + 3*B*a^2*b*g^3*x + B*a^3*g^3)*log((d
^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^3\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2)),x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)), x)
```

3.224 $\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{(ag+bgx)^2}{\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

Rubi [A] time = 0.211595, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] a^2*g^2*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-2), x] + 2*a*
b*g^2*Defer[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x] + b^2*g^2
*Defer[Int][x^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx &= \int \left(\frac{a^2g^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}+\frac{2abg^2x}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}+\frac{b^2g^2x^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\right)dx\\ &= \left(a^2g^2\right)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx+\left(2abg^2\right)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx+\left(b^2g^2\right)\int\end{aligned}$$

Mathematica [A] time = 0.460496, size = 0, normalized size = 0.

$$\int \frac{(ag+bgx)^2}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)^2/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

Maple [A] time = 1., size = 0, normalized size = 0.

$$\int \left(bgx+ag\right)^{2}\left(A+B\ln\left(\frac{e\,(dx+c)^{2}}{(bx+a)^{2}}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^3dg^2x^4+a^3cg^2+\left(b^3cg^2+3\,ab^2dg^2\right)x^3+3\left(ab^2cg^2+a^2bdg^2\right)x^2+\left(3\,a^2bcg^2+a^3dg^2\right)x}{2\left(2\,(bc-ad)B^2\log(bx+a)-2\,(bc-ad)B^2\log(dx+c)-(bc-ad)AB-(bc\log(e)-ad\log(e))B^2\right)}+\int\frac{4}{2\left(2\,(bc-ad\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] -1/2*(b^3*d*g^2*x^4 + a^3*c*g^2 + (b^3*c*g^2 + 3*a*b^2*d*g^2)*x^3 + 3*(a*b^
2*c*g^2 + a^2*b*d*g^2)*x^2 + (3*a^2*b*c*g^2 + a^3*d*g^2)*x)/(2*(b*c - a*d)*
B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*
log(e) - a*d*log(e))*B^2) + integrate(1/2*(4*b^3*d*g^2*x^3 + 3*a^2*b*c*g^2
+ a^3*d*g^2 + 3*(b^3*c*g^2 + 3*a*b^2*d*g^2)*x^2 + 6*(a*b^2*c*g^2 + a^2*b*d*
```

```
g^2)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) -
(b*c - a*d)*A*B - (b*c*log(e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2g^2x^2 + 2\,abg^2x + a^2g^2}{B^2\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2 + 2\,AB\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral((b^2*g^2*x^2 + 2*a*b*g^2*x + a^2*g^2)/(B^2*log((d^2*e*x^2 + 2*c*d*
e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*A*B*log((d^2*e*x^2 + 2*c*d*e*
x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bgx + ag)^2}{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate((b*g*x + a*g)^2/(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

3.225 $\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=34

$$\text{Unintegrable}\left(\frac{ag+bgx}{\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2},x\right)$$

[Out] Unintegrable[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]

Rubi [A] time = 0.109584, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]

[Out] a*g*Defer[Int][(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^(-2), x] + b*g*Defe r[Int][x/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]

Rubi steps

$$\begin{aligned}\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx &= \int \left(\frac{ag}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}+\frac{bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\right)dx\\ &= (ag)\int \frac{1}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx+(bg)\int \frac{x}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.341781, size = 0, normalized size = 0.

$$\int \frac{ag+bgx}{\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2,x]
```

```
[Out] Integrate[(a*g + b*g*x)/(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2, x]
```

Maple [A] time = 1.026, size = 0, normalized size = 0.

$$\int (bgx+ag)\left(A+B\ln\left(\frac{e\,(dx+c)^2}{(bx+a)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int((b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{b^2dgx^3+a^2cg+\left(b^2cg+2\,abdg\right)x^2+\left(2\,abcg+a^2dg\right)x}{2\left(2\,(bc-ad)B^2\log\,(bx+a)-2\,(bc-ad)B^2\log\,(dx+c)-(bc-ad)AB-(bc\log\,(e)-ad\log\,(e))B^2\right)}+\int\frac{}{2\left(2\,(bc-ad\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b^2*d*g*x^3 + a^2*c*g + (b^2*c*g + 2*a*b*d*g)*x^2 + (2*a*b*c*g + a^2*
d*g)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) -
(b*c - a*d)*A*B - (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(3*b^2*d*g
*x^2 + 2*a*b*c*g + a^2*d*g + 2*(b^2*c*g + 2*a*b*d*g)*x)/(2*(b*c - a*d)*B^2*
log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) - (b*c - a*d)*A*B - (b*c*log(
```

```
e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bgx+ag}{B^2\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\,AB\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral((b*g*x + a*g)/(B^2*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 +
2*a*b*x + a^2))^2 + 2*A*B*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*
a*b*x + a^2)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{bgx+ag}{\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate((b*g*x + a*g)/(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2, x)
```

3.226 $\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=36

$$\text{Unintegrable}\left(\frac{1}{(ag+bgx)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),
x]
```

Rubi [A] time = 0.0821686, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.143205, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x]
```

Maple [A] time = 1.024, size = 0, normalized size = 0.

$$\int \frac{1}{bgx+ag}\left(A+B\ln\left(\frac{e(dx+c)^2}{(bx+a)^2}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$d\int \frac{1}{2\left(2\left(bcg-adg\right)B^2\log\left(bx+a\right)-2\left(bcg-adg\right)B^2\log\left(dx+c\right)-\left(bcg-adg\right)AB-\left(bcg\log\left(e\right)-adg\log\left(e\right)\right)B^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="ma
xima")
```

```
[Out] d*integrate(1/2/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B^2
*log(d*x + c) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2), x
) - 1/2*(d*x + c)/(2*(b*c*g - a*d*g)*B^2*log(b*x + a) - 2*(b*c*g - a*d*g)*B
^2*log(d*x + c) - (b*c*g - a*d*g)*A*B - (b*c*g*log(e) - a*d*g*log(e))*B^2)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2bgx+A^2ag+\left(B^2bgx+B^2ag\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2+2\left(ABbgx+ABag\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="fr
icas")
```

```
[Out] integral(1/(A^2*b*g*x + A^2*a*g + (B^2*b*g*x + B^2*a*g)*log((d^2*e*x^2 + 2*
c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b*g*x + A*B*a*g)*log
((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(bgx+ag)\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="gi
ac")
```

```
[Out] integrate(1/((b*g*x + a*g)*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2), x)
```

3.227 $\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=147

$$\frac{c+dx}{2Bg^2(a+bx)(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}-\frac{e^{-\frac{A}{2B}}(c+dx)\text{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{4B^2g^2(a+bx)(bc-ad)\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}$$

```
[Out] -((c + d*x)*ExpIntegralEi[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*B)])/
(4*B^2*(b*c - a*d)*E^(A/(2*B))*g^2*(a + b*x)*Sqrt[(e*(c + d*x)^2)/(a + b*x)
^2]) + (c + d*x)/(2*B*(b*c - a*d)*g^2*(a + b*x)*(A + B*Log[(e*(c + d*x)^2)/
(a + b*x)^2]))
```

Rubi [F] time = 0.0930418, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.182028, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x
]
```

Maple [F] time = 1.406, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2}\left(A+B\ln\left(\frac{e\left(dx+c\right)^2}{\left(bx+a\right)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{dx+}{2\left(\left(abcg^2-a^2dg^2\right)AB+\left(abcg^2\log(e)-a^2dg^2\log(e)\right)B^2+\left(\left(b^2cg^2-abdg^2\right)AB+\left(b^2cg^2\log(e)-abdg^2\log(e)\right)B^2\right)x-2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
maxima")
```

```
[Out] 1/2*(d*x + c)/((a*b*c*g^2 - a^2*d*g^2)*A*B + (a*b*c*g^2*log(e) - a^2*d*g^2*
log(e))*B^2 + ((b^2*c*g^2 - a*b*d*g^2)*A*B + (b^2*c*g^2*log(e) - a*b*d*g^2*
log(e))*B^2)*x - 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*g^2)
*B^2)*log(b*x + a) + 2*((b^2*c*g^2 - a*b*d*g^2)*B^2*x + (a*b*c*g^2 - a^2*d*
```

```
g^2)*B^2)*log(d*x + c)) + integrate(1/2/(B^2*a^2*g^2*log(e) + A*B*a^2*g^2 +
 (B^2*b^2*g^2*log(e) + A*B*b^2*g^2)*x^2 + 2*(B^2*a*b*g^2*log(e) + A*B*a*b*g
^2)*x - 2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(b*x + a) +
2*(B^2*b^2*g^2*x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log(d*x + c)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2b^2g^2x^2 + 2\,A^2abg^2x + A^2a^2g^2 + \left(B^2b^2g^2x^2 + 2\,B^2abg^2x + B^2a^2g^2\right)\log\left(\frac{d^2ex^2+2\,cdex+c^2e}{b^2x^2+2\,abx+a^2}\right)^2 + 2\left(ABb^2g^2x^2 + \right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^2*g^2*x^2 + 2*A^2*a*b*g^2*x + A^2*a^2*g^2 + (B^2*b^2*g^2*
x^2 + 2*B^2*a*b*g^2*x + B^2*a^2*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b
^2*x^2 + 2*a*b*x + a^2))^2 + 2*(A*B*b^2*g^2*x^2 + 2*A*B*a*b*g^2*x + A*B*a^2
*g^2)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx + ag\right)^2\left(B\log\left(\frac{(dx+c)^2e}{(bx+a)^2}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2), x)
```

3.228 $\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=206

$$\frac{de^{-\frac{A}{2B}}(c+dx)\,\mathrm{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{2B}\right)}{4B^2g^3(a+bx)(bc-ad)^2\sqrt{\frac{e(c+dx)^2}{(a+bx)^2}}}-\frac{be^{-\frac{A}{B}}\,\mathrm{Ei}\left(\frac{A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)}{B}\right)}{2B^2eg^3(bc-ad)^2}+\frac{c+dx}{2Bg^3(a+bx)^2(bc-ad)\left(B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)+A\right)}$$

```
[Out] (d*(c + d*x)*ExpIntegralEi[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/(2*B)])
/(4*B^2*(b*c - a*d)^2*E^(A/(2*B))*g^3*(a + b*x)*Sqrt[(e*(c + d*x)^2)/(a + b
*x)^2]) - (b*ExpIntegralEi[(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])/B])/(2*
B^2*(b*c - a*d)^2*e*E^(A/B)*g^3) + (c + d*x)/(2*B*(b*c - a*d)*g^3*(a + b*x)
^2*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2]))
```

Rubi [F] time = 0.0850021, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),
x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx=\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Mathematica [F] time = 0.354644, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^3\left(A+B\log\left(\frac{e(c+dx)^2}{(a+bx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^3*(A + B*Log[(e*(c + d*x)^2)/(a + b*x)^2])^2), x
]
```

Maple [F] time = 1.622, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}}\left(A+B\ln\left(\frac{e\left(dx+c\right)^{2}}{\left(bx+a\right)^{2}}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

```
[Out] int(1/(b*g*x+a*g)^3/(A+B*ln(e*(d*x+c)^2/(b*x+a)^2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
maxima")
```

```
[Out] 1/2*(d*x + c)/((a^2*b*c*g^3 - a^3*d*g^3)*A*B + (a^2*b*c*g^3*log(e) - a^3*d*
g^3*log(e))*B^2 + ((b^3*c*g^3 - a*b^2*d*g^3)*A*B + (b^3*c*g^3*log(e) - a*b^
2*d*g^3*log(e))*B^2)*x^2 + 2*((a*b^2*c*g^3 - a^2*b*d*g^3)*A*B + (a*b^2*c*g^
3*log(e) - a^2*b*d*g^3*log(e))*B^2)*x - 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^
2 + 2*(a*b^2*c*g^3 - a^2*b*d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*lo
```

```
g(b*x + a) + 2*((b^3*c*g^3 - a*b^2*d*g^3)*B^2*x^2 + 2*(a*b^2*c*g^3 - a^2*b*
d*g^3)*B^2*x + (a^2*b*c*g^3 - a^3*d*g^3)*B^2)*log(d*x + c)) - integrate(-1/
2*(b*d*x + 2*b*c - a*d)/(((b^4*c*g^3 - a*b^3*d*g^3)*A*B + (b^4*c*g^3*log(e)
 - a*b^3*d*g^3*log(e))*B^2)*x^3 + (a^3*b*c*g^3 - a^4*d*g^3)*A*B + (a^3*b*c*
g^3*log(e) - a^4*d*g^3*log(e))*B^2 + 3*((a*b^3*c*g^3 - a^2*b^2*d*g^3)*A*B +
 (a*b^3*c*g^3*log(e) - a^2*b^2*d*g^3*log(e))*B^2)*x^2 + 3*((a^2*b^2*c*g^3 -
 a^3*b*d*g^3)*A*B + (a^2*b^2*c*g^3*log(e) - a^3*b*d*g^3*log(e))*B^2)*x - 2*
((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*b^2*d*g^3)*B^2*x^
2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 - a^4*d*g^3)*B^2)*
log(b*x + a) + 2*((b^4*c*g^3 - a*b^3*d*g^3)*B^2*x^3 + 3*(a*b^3*c*g^3 - a^2*
b^2*d*g^3)*B^2*x^2 + 3*(a^2*b^2*c*g^3 - a^3*b*d*g^3)*B^2*x + (a^3*b*c*g^3 -
 a^4*d*g^3)*B^2)*log(d*x + c)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2b^3g^3x^3 + 3\,A^2ab^2g^3x^2 + 3\,A^2a^2bg^3x + A^2a^3g^3 + \left(B^2b^3g^3x^3 + 3\,B^2ab^2g^3x^2 + 3\,B^2a^2bg^3x + B^2a^3g^3\right)\log\left(\frac{d^2}{b}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
fricas")
```

```
[Out] integral(1/(A^2*b^3*g^3*x^3 + 3*A^2*a*b^2*g^3*x^2 + 3*A^2*a^2*b*g^3*x + A^2
*a^3*g^3 + (B^2*b^3*g^3*x^3 + 3*B^2*a*b^2*g^3*x^2 + 3*B^2*a^2*b*g^3*x + B^2
*a^3*g^3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))^2
+ 2*(A*B*b^3*g^3*x^3 + 3*A*B*a*b^2*g^3*x^2 + 3*A*B*a^2*b*g^3*x + A*B*a^3*g^
3)*log((d^2*e*x^2 + 2*c*d*e*x + c^2*e)/(b^2*x^2 + 2*a*b*x + a^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**3/(A+B*ln(e*(d*x+c)**2/(b*x+a)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{3}\left(B\log\left(\frac{(dx+c)^{2}e}{(bx+a)^{2}}\right)+A\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^3/(A+B*log(e*(d*x+c)^2/(b*x+a)^2))^2,x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^3*(B*log((d*x + c)^2*e/(b*x + a)^2) + A)^2), x)
```

3.229 $\int \frac{1}{(ag+bgx)^2(A+B\log(e(a+bx)^n(c+dx)^{-n}))}\,dx$

Optimal. Leaf size=96

$$\frac{e^{\frac{A}{Bn}}(c+dx)\left(e(a+bx)^n(c+dx)^{-n}\right)^{\frac{1}{n}}\operatorname{Ei}\left(-\frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{Bn}\right)}{Bg^2n(a+bx)(bc-ad)}$$

```
[Out] (E^(A/(B*n))*(c + d*x)*((e*(a + b*x)^n)/(c + d*x)^n)^n^(-1)*ExpIntegralEi[-
((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(B*n))])/(B*(b*c - a*d)*g^2*n*(a
+ b*x))
```

Rubi [F] time = 0.102474, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Defer[Int][1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

Rubi steps

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx=\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Mathematica [F] time = 0.0590735, size = 0, normalized size = 0.

$$\int \frac{1}{(ag+bgx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])),x]
```

```
[Out] Integrate[1/((a*g + b*g*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])), x]
```

Maple [F] time = 0.046, size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] int(1/(b*g*x+a*g)^2/(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^{2}\left(B\log\left(\frac{(bx+a)^{n}e}{(dx+c)^{n}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
maxima")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

Fricas [A] time = 1.04724, size = 149, normalized size = 1.55

$$\frac{e^{\left(\frac{B\log(e)+A}{Bn}\right)}\operatorname{log\_integral}\left(\frac{(dx+c)e^{\left(-\frac{B\log(e)+A}{Bn}\right)}}{bx+a}\right)}{(Bbc-Bad)g^{2}n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
fricas")
```

```
[Out] e^((B*log(e) + A)/(B*n))*log_integral((d*x + c)*e^(-(B*log(e) + A)/(B*n))/(
b*x + a))/((B*b*c - B*a*d)*g^2*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)**2/(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(bgx+ag\right)^2\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*g*x+a*g)^2/(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="
giac")
```

```
[Out] integrate(1/((b*g*x + a*g)^2*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)), x)
```

3.230 $\int (f+gx)^4 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=355

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+\frac{Bgx(bc-ad)\left(-a^2bd^2g^2(5df-cg)+a^3d^3g^3\right.}{}$$

```
[Out] (B*(b*c - a*d)*g*(a^3*d^3*g^3 - a^2*b*d^2*g^2*(5*d*f - c*g) + a*b^2*d*g*(10
*d^2*f^2 - 5*c*d*f*g + c^2*g^2) - b^3*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*
d*f*g^2 - c^3*g^3))*x)/(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*
d*g*(5*d*f - c*g) + b^2*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*x^2)/(10*b^3*d^
3) - (B*(b*c - a*d)*g^3*(5*b*d*f - b*c*g - a*d*g)*x^3)/(15*b^2*d^2) - (B*(b
*c - a*d)*g^4*x^4)/(20*b*d) - (B*(b*f - a*g)^5*Log[a + b*x])/(5*b^5*g) + ((
f + g*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(5*g) + (B*(d*f - c*g)^5*L
og[c + d*x])/(5*d^5*g)
```

Rubi [A] time = 0.556875, antiderivative size = 339, normalized size of antiderivative = 0.95, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{10b^3d^3}+\frac{Bgx\left(-10a^2b^2d^4f^2g+5a^3bd^4fg^2-a^4d^4g^3\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (B*g*(10*a*b^3*d^4*f^3 - 10*a^2*b^2*d^4*f^2*g + 5*a^3*b*d^4*f*g^2 - a^4*d^4
*g^3 - b^4*c*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*d*f*g^2 - c^3*g^3))*x)/(5
*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*d*g*(5*d*f - c*g) + b^2*(
10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*x^2)/(10*b^3*d^3) - (B*(b*c - a*d)*g^3*(
5*b*d*f - b*c*g - a*d*g)*x^3)/(15*b^2*d^2) - (B*(b*c - a*d)*g^4*x^4)/(20*b*
d) - (B*(b*f - a*g)^5*Log[a + b*x])/(5*b^5*g) + ((f + g*x)^5*(A + B*Log[(e*
(a + b*x))/(c + d*x)]))/(5*g) + (B*(d*f - c*g)^5*Log[c + d*x])/(5*d^5*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
```

```
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5g}-\frac{B\int \frac{(bc-ad)(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5g}-\frac{(B(bc-ad))\int \frac{(f+gx)^5}{(a+bx)(c+dx)}\,dx}{5g}$$

$$= \frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{5g}-\frac{(B(bc-ad))\int \left(\frac{g^2\left(-a^3d^3g^3+a^2bd^2g^2(5df-cg)-ab^2\right.}{}\right.}{}$$

$$= \frac{B(bc-ad)g\left(a^3d^3g^3-a^2bd^2g^2(5df-cg)+ab^2dg\left(10d^2f^2-5cdfg+c^2g^2\right)-\right.}{5b^4d^4}$$

Mathematica [A] time = 0.586314, size = 279, normalized size = 0.79

$$\frac{\frac{Bg^2x(ad-bc)\left(6a^2bd^2g^2(-2cg+10df+dgx)-12a^3d^3g^3-2ab^2dg\left(6c^2g^2-3cdg(10f+gx)+d^2\left(60f^2+15fgx+2g^2x^2\right)\right)+b^3\left(6c^2dg^2(10f+gx)-12c^3g^3-2cd^2g\left(60f^2+15fg\right.\right.}{12b^4d^4}}{5g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] ((B*(-(b*c) + a*d)*g^2*x*(-12*a^3*d^3*g^3 + 6*a^2*b*d^2*g^2*(10*d*f - 2*c*g
 + d*g*x) - 2*a*b^2*d*g*(6*c^2*g^2 - 3*c*d*g*(10*f + g*x) + d^2*(60*f^2 + 1
```

```
5*f*g*x + 2*g^2*x^2)) + b^3*(-12*c^3*g^3 + 6*c^2*d*g^2*(10*f + g*x) - 2*c*d
^2*g*(60*f^2 + 15*f*g*x + 2*g^2*x^2) + d^3*(120*f^3 + 60*f^2*g*x + 20*f*g^2
*x^2 + 3*g^3*x^3))))/(12*b^4*d^4) - (B*(b*f - a*g)^5*Log[a + b*x])/b^5 + (f
 + g*x)^5*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + (B*(d*f - c*g)^5*Log[c + d
*x])/d^5)/(5*g)
```

Maple [B] time = 0.231, size = 14719, normalized size = 41.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [A] time = 1.22073, size = 801, normalized size = 2.26

$$\frac{1}{5}Ag^4x^5 + Afg^3x^4 + 2Af^2g^2x^3 + 2Af^3gx^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bf^4 + 2\left(x^2\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/5*A*g^4*x^5 + A*f*g^3*x^4 + 2*A*f^2*g^2*x^3 + 2*A*f^3*g*x^2 + (x*log(b*e*
x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*f^4 +
 2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*l
og(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*f^3*g + (2*x^3*log(b*e*x/(d*x + c)
 + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2
*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f^2*g^2 + 1/6*(
6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4
*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d
^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*f*g^3 + 1/60*(12*x^5*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) + 12*a^5*log(b*x + a)/b^5 - 12*c^5*log(d*x +
 c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a^2*b^2*d^4)*x^
3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)/(b^4*d^4))*B*
g^4 + A*f^4*x
```

Fricas [A] time = 3.51736, size = 1283, normalized size = 3.61

$$12\,Ab^5d^5g^4x^5+3\left(20\,Ab^5d^5fg^3-\left(Bb^5cd^4-Bab^4d^5\right)g^4\right)x^4+4\left(30\,Ab^5d^5f^2g^2-5\left(Bb^5cd^4-Bab^4d^5\right)fg^3+\left(Bb^5c^2d^3-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/60*(12*A*b^5*d^5*g^4*x^5 + 3*(20*A*b^5*d^5*f*g^3 - (B*b^5*c*d^4 - B*a*b^4
*d^5)*g^4)*x^4 + 4*(30*A*b^5*d^5*f^2*g^2 - 5*(B*b^5*c*d^4 - B*a*b^4*d^5)*f*
g^3 + (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*g^4)*x^3 + 6*(20*A*b^5*d^5*f^3*g - 10
*(B*b^5*c*d^4 - B*a*b^4*d^5)*f^2*g^2 + 5*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f*
g^3 - (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g^4)*x^2 + 12*(5*A*b^5*d^5*f^4 - 10*(
B*b^5*c*d^4 - B*a*b^4*d^5)*f^3*g + 10*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f^2*g
^2 - 5*(B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*f*g^3 + (B*b^5*c^4*d - B*a^4*b*d^5)*
g^4)*x + 12*(5*B*a*b^4*d^5*f^4 - 10*B*a^2*b^3*d^5*f^3*g + 10*B*a^3*b^2*d^5*
f^2*g^2 - 5*B*a^4*b*d^5*f*g^3 + B*a^5*d^5*g^4)*log(b*x + a) - 12*(5*B*b^5*c
*d^4*f^4 - 10*B*b^5*c^2*d^3*f^3*g + 10*B*b^5*c^3*d^2*f^2*g^2 - 5*B*b^5*c^4*
d*f*g^3 + B*b^5*c^5*g^4)*log(d*x + c) + 12*(B*b^5*d^5*g^4*x^5 + 5*B*b^5*d^5
*f*g^3*x^4 + 10*B*b^5*d^5*f^2*g^2*x^3 + 10*B*b^5*d^5*f^3*g*x^2 + 5*B*b^5*d^
5*f^4*x)*log((b*e*x + a*e)/(d*x + c)))/(b^5*d^5)
```

Sympy [B] time = 36.98, size = 1528, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**4*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g**4*x**5/5 + B*a*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g**2 -
 10*a*b**3*f**3*g + 5*b**4*f**4)*log(x + (B*a**5*c*d**4*g**4 - 5*B*a**4*b*c
*d**4*f*g**3 + 10*B*a**3*b**2*c*d**4*f**2*g**2 - 10*B*a**2*b**3*c*d**4*f**3
*g + B*a**2*d**5*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g**2 - 10
*a*b**3*f**3*g + 5*b**4*f**4)/b + B*a*b**4*c**5*g**4 - 5*B*a*b**4*c**4*d*f*
g**3 + 10*B*a*b**4*c**3*d**2*f**2*g**2 - 10*B*a*b**4*c**2*d**3*f**3*g + 10*
B*a*b**4*c*d**4*f**4 - B*a*c*d**4*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b*
*2*f**2*g**2 - 10*a*b**3*f**3*g + 5*b**4*f**4))/(B*a**5*d**5*g**4 - 5*B*a**
4*b*d**5*f*g**3 + 10*B*a**3*b**2*d**5*f**2*g**2 - 10*B*a**2*b**3*d**5*f**3*
```

```
g + 5*B*a*b**4*d**5*f**4 + B*b**5*c**5*g**4 - 5*B*b**5*c**4*d*f*g**3 + 10*B
*b**5*c**3*d**2*f**2*g**2 - 10*B*b**5*c**2*d**3*f**3*g + 5*B*b**5*c*d**4*f*
*4))/(5*b**5) - B*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d**2*f**2*g**2 -
 10*c*d**3*f**3*g + 5*d**4*f**4)*log(x + (B*a**5*c*d**4*g**4 - 5*B*a**4*b*c
*d**4*f*g**3 + 10*B*a**3*b**2*c*d**4*f**2*g**2 - 10*B*a**2*b**3*c*d**4*f**3
*g + B*a*b**4*c**5*g**4 - 5*B*a*b**4*c**4*d*f*g**3 + 10*B*a*b**4*c**3*d**2*
f**2*g**2 - 10*B*a*b**4*c**2*d**3*f**3*g + 10*B*a*b**4*c*d**4*f**4 - B*a*b*
*4*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d**2*f**2*g**2 - 10*c*d**3*f**3
*g + 5*d**4*f**4) + B*b**5*c**2*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d**2
*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4)/d)/(B*a**5*d**5*g**4 - 5*B*a**
4*b*d**5*f*g**3 + 10*B*a**3*b**2*d**5*f**2*g**2 - 10*B*a**2*b**3*d**5*f**3*
g + 5*B*a*b**4*d**5*f**4 + B*b**5*c**5*g**4 - 5*B*b**5*c**4*d*f*g**3 + 10*B
*b**5*c**3*d**2*f**2*g**2 - 10*B*b**5*c**2*d**3*f**3*g + 5*B*b**5*c*d**4*f*
*4))/(5*d**5) + (B*f**4*x + 2*B*f**3*g*x**2 + 2*B*f**2*g**2*x**3 + B*f*g**3
*x**4 + B*g**4*x**5/5)*log(e*(a + b*x)/(c + d*x)) + x**4*(20*A*b*d*f*g**3 +
 B*a*d*g**4 - B*b*c*g**4)/(20*b*d) - x**3*(-30*A*b**2*d**2*f**2*g**2 + B*a*
*2*d**2*g**4 - 5*B*a*b*d**2*f*g**3 - B*b**2*c**2*g**4 + 5*B*b**2*c*d*f*g**3
)/(15*b**2*d**2) + x**2*(20*A*b**3*d**3*f**3*g + B*a**3*d**3*g**4 - 5*B*a**
2*b*d**3*f*g**3 + 10*B*a*b**2*d**3*f**2*g**2 - B*b**3*c**3*g**4 + 5*B*b**3*
c**2*d*f*g**3 - 10*B*b**3*c*d**2*f**2*g**2)/(10*b**3*d**3) - x*(-5*A*b**4*d
**4*f**4 + B*a**4*d**4*g**4 - 5*B*a**3*b*d**4*f*g**3 + 10*B*a**2*b**2*d**4*
f**2*g**2 - 10*B*a*b**3*d**4*f**3*g - B*b**4*c**4*g**4 + 5*B*b**4*c**3*d*f*
g**3 - 10*B*b**4*c**2*d**2*f**2*g**2 + 10*B*b**4*c*d**3*f**3*g)/(5*b**4*d**
4)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

3.231 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=227

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g}-\frac{Bg^2x^2(bc-$$

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*x)/(4*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g -
 a*d*g)*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3)/(12*b*d) - (B*(b*f - a*g
)^4*Log[a + b*x])/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(4*g) + (B*(d*f - c*g)^4*Log[c + d*x])/(4*d^4*g)
```

Rubi [A] time = 0.341136, antiderivative size = 227, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{4b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{4g}-\frac{Bg^2x^2(bc-$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*x)/(4*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g -
 a*d*g)*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3)/(12*b*d) - (B*(b*f - a*g
)^4*Log[a + b*x])/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(4*g) + (B*(d*f - c*g)^4*Log[c + d*x])/(4*d^4*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4g} - \frac{B\int\frac{(bc-ad)(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4g} - \frac{(B(bc-ad))\int\frac{(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4g} - \frac{(B(bc-ad))\int\left(\frac{g^2\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-\right.\right.}{b^3d^3}\right.}{}$$

$$= -\frac{B(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{4b^3d^3} - \frac{B(b}{}$$

Mathematica [A] time = 0.261989, size = 215, normalized size = 0.95

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right) - \frac{B\left(6bdg^2x(bc-ad)\left(a^2d^2g^2+abdg(cg-4df)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)+3b^2d^2g^3x^2(bc-ad)(-adg-bcg+4bdf)+2b^3d^3g^4x^3\right.}{6b^4d^4}}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(6*b*d*(b*c - a*d)*g
^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2
*g^2))*x + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2 + 2*b^3*
d^3*(b*c - a*d)*g^4*x^3 + 6*d^4*(b*f - a*g)^4*Log[a + b*x] - 6*b^4*(d*f - c
*g)^4*Log[c + d*x]))/(6*b^4*d^4))/(4*g)
```

Maple [B] time = 0.2, size = 8605, normalized size = 37.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] result too large to display
```

Maxima [A] time = 1.20154, size = 560, normalized size = 2.47

$$\frac{1}{4}Ag^3x^4 + Afg^2x^3 + \frac{3}{2}Af^2gx^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bf^3 + \frac{3}{2}\left(x^2\log\left(\frac{bex}{dx+c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/4*A*g^3*x^4 + A*f*g^2*x^3 + 3/2*A*f^2*g*x^2 + (x*log(b*e*x/(d*x + c) + a*
e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*B*f^3 + 3/2*(x^2*log(b*
e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^
2 - (b*c - a*d)*x/(b*d))*B*f^2*g + 1/2*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*
x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b
*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f*g^2 + 1/24*(6*x^4*log(b
*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x +
c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6
*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*g^3 + A*f^3*x
```

Fricas [B] time = 1.83661, size = 895, normalized size = 3.94

$$\frac{6\,Ab^4d^4g^3x^4 + 2\left(12\,Ab^4d^4fg^2 - \left(Bb^4cd^3 - Bab^3d^4\right)g^3\right)x^3 + 3\left(12\,Ab^4d^4f^2g - 4\left(Bb^4cd^3 - Bab^3d^4\right)fg^2 + \left(Bb^4c^2d^2 - Ba\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/24*(6*A*b^4*d^4*g^3*x^4 + 2*(12*A*b^4*d^4*f*g^2 - (B*b^4*c*d^3 - B*a*b^3*
d^4)*g^3)*x^3 + 3*(12*A*b^4*d^4*f^2*g - 4*(B*b^4*c*d^3 - B*a*b^3*d^4)*f*g^2
 + (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g^3)*x^2 + 6*(4*A*b^4*d^4*f^3 - 6*(B*b^4
*c*d^3 - B*a*b^3*d^4)*f^2*g + 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*f*g^2 - (B*
b^4*c^3*d - B*a^3*b*d^4)*g^3)*x + 6*(4*B*a*b^3*d^4*f^3 - 6*B*a^2*b^2*d^4*f^
2*g + 4*B*a^3*b*d^4*f*g^2 - B*a^4*d^4*g^3)*log(b*x + a) - 6*(4*B*b^4*c*d^3*
f^3 - 6*B*b^4*c^2*d^2*f^2*g + 4*B*b^4*c^3*d*f*g^2 - B*b^4*c^4*g^3)*log(d*x
+ c) + 6*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*d^4*f*g^2*x^3 + 6*B*b^4*d^4*f^2*g*x^2
 + 4*B*b^4*d^4*f^3*x)*log((b*e*x + a*e)/(d*x + c)))/(b^4*d^4)
```

Sympy [B] time = 20.5577, size = 1049, normalized size = 4.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g**3*x**4/4 - B*a*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)*log
(x + (B*a**4*c*d**3*g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*
f**2*g + B*a**2*d**4*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)/b
+ B*a*b**3*c**4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2
*g - 8*B*a*b**3*c*d**3*f**3 - B*a*c*d**3*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f
*g + 2*b**2*f**2))/(B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b*
*2*d**4*f**2*g - 4*B*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*
f*g**2 + 6*B*b**4*c**2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(4*b**4) + B*c*
(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)*log(x + (B*a**4*c*d**3*
g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*f**2*g + B*a*b**3*c*
*4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2*g - 8*B*a*b*
*3*c*d**3*f**3 - B*a*b**3*c*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f
**2) + B*b**4*c**2*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)/d)/(
B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b**2*d**4*f**2*g - 4*B
*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*f*g**2 + 6*B*b**4*c*
*2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(4*d**4) + (B*f**3*x + 3*B*f**2*g*x
**2/2 + B*f*g**2*x**3 + B*g**3*x**4/4)*log(e*(a + b*x)/(c + d*x)) + x**3*(1
2*A*b*d*f*g**2 + B*a*d*g**3 - B*b*c*g**3)/(12*b*d) - x**2*(-12*A*b**2*d**2*
f**2*g + B*a**2*d**2*g**3 - 4*B*a*b*d**2*f*g**2 - B*b**2*c**2*g**3 + 4*B*b*
*2*c*d*f*g**2)/(8*b**2*d**2) + x*(4*A*b**3*d**3*f**3 + B*a**3*d**3*g**3 - 4
*B*a**2*b*d**3*f*g**2 + 6*B*a*b**2*d**3*f**2*g - B*b**3*c**3*g**3 + 4*B*b**
3*c**2*d*f*g**2 - 6*B*b**3*c*d**2*f**2*g)/(4*b**3*d**3)
```

<u>**Giac**</u> **[F(-1)]** time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] Timed out
```

3.232 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right) dx$

Optimal. Leaf size=150

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g}-\frac{Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2x^2(bc-ad)}{6bd}+\frac{B(df$$

```
[Out] -(B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*x)/(3*b^2*d^2) - (B*(b*c - a*d)
*g^2*x^2)/(6*b*d) - (B*(b*f - a*g)^3*Log[a + b*x])/(3*b^3*g) + ((f + g*x)^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*g) + (B*(d*f - c*g)^3*Log[c + d*x
])/(3*d^3*g)
```

Rubi [A] time = 0.169498, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{3g}-\frac{Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2x^2(bc-ad)}{6bd}+\frac{B(df$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*x)/(3*b^2*d^2) - (B*(b*c - a*d)
*g^2*x^2)/(6*b*d) - (B*(b*f - a*g)^3*Log[a + b*x])/(3*b^3*g) + ((f + g*x)^3
*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*g) + (B*(d*f - c*g)^3*Log[c + d*x
])/(3*d^3*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3g}-\frac{B\int\frac{(bc-ad)(f+gx)^3}{(a+bx)(c+dx)}\,dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3g}-\frac{(B(bc-ad))\int\frac{(f+gx)^3}{(a+bx)(c+dx)}\,dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3g}-\frac{(B(bc-ad))\int\left(\frac{g^2(3bdf-bcg-adg)}{b^2d^2}+\frac{g^3x}{bd}+\frac{\cdots}{b^2(b\cdots}\right.}{3g}$$

$$=-\frac{B(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2}-\frac{B(bc-ad)g^2x^2}{6bd}-\frac{B(bf-ag)^3\log(a+b\cdots}{3b^3g}$$

Mathematica [A] time = 0.131928, size = 142, normalized size = 0.95

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)-\frac{B\left(b^2d^2g^3x^2(bc-ad)+2bdg^2x(bc-ad)(-adg-bcg+3bdf)+2d^3(bf-ag)^3\log(a+bx)-2b^3(df-cg)^3\log(c+dx)\right)}{2b^3d^3}}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - (B*(2*b*d*(b*c - a*d)*g
^2*(3*b*d*f - b*c*g - a*d*g)*x + b^2*d^2*(b*c - a*d)*g^3*x^2 + 2*d^3*(b*f -
 a*g)^3*Log[a + b*x] - 2*b^3*(d*f - c*g)^3*Log[c + d*x]))/(2*b^3*d^3))/(3*g
)
```

Maple [B] time = 0.184, size = 4406, normalized size = 29.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] -1/6*e^2/d^3*B*g^2*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3-1/3*e^3/d^3*A*g^
2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*b^3*c^3-e^2/d*A*g^2/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^2*a^2*c+e^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)^2*a^2*f-e/d*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f^2*b*c+e/d*B*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*g^2/(d*x+c)*
a^2-e^2/d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c
)*b*c)^2*c^4*f/(d*x+c)^2-2*e^3*d^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^
2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^5/(d*x+c)^3*c-e^2*d^2*B*g*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4*f/(d*x+c)^2-2*e^
2/d*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b*c*f*a+e/d^3*B*ln(b*e/d+(a*d-b*c)*
e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^4*g^2/(d*x+c)*b+e*d*B*ln(b*e/d
+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f^2/(d*x+c)*a^2+1/3
*e^3*A*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3+e^2*d*B*g^2*ln(b*e/d+(a*d-b*
c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4*c/(d*x+c)^2+5*e^3*d
*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^
4*c^2/(d*x+c)^3+5*e^3/d*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)^3*a^2*c^4/(d*x+c)^3*b-2*e^2/d*B*g*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*f*b*c-2*e^3/d^2*B*g^2*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*c^5/(d*x+c)^3-2*
e/d^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*f
*g/(d*x+c)*b+4*e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+
c)*b*c)*c^2*f*g/(d*x+c)*a-4*e^2/d^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^4/(d*x+c)^2*b-2*e*B*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c*f*g/(d*x+c)*a^2-1/2*e^2/d*B*g
^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c+e*B*g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)*a^2*f+e/d^2*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*a-2/3*e/d^3*B*g^2/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*b+e/d^2*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^
2*g^2*a-e/d^3*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*g^2*b-e^2/d^3*A*g^2/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)^2*b^2*c^3+e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)*f^2/(d*x+c)*c^2*b+e^2/d^3*B*g^2*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^5/(d*x+c)^2+2*e/d^2*
B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*f*g*b+e
^2/d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^2*c^2*f-2*e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)*c*f*g*a+1/3*e^3*d^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b^3/(d*e/(d*
x+c)*a-e/(d*x+c)*b*c)^3*a^6/(d*x+c)^3+6*e^2/d*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/
```

```
(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c^3/(d*x+c)^2-4*e^2*B*g^2*ln(b
*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*c^2/(d*x+
c)^2-6*e^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)^2*c^2*f/(d*x+c)^2*a^2+1/3*e^3/d^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b
^3/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^6/(d*x+c)^3-e^3/d*B*g^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*c*b+2*e^2/d^2*B*g^2*l
n(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2*b*a+e^3/
d^2*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a
*c^2*b^2-2*e/d^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)*c^3*g^2/(d*x+c)*a+e*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f^2*a-B/b*ln(d*(b
*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*f^2*a-1/3*B*g^2/b^3*ln(d*(b*e/d+(a*d-b*c)*
e/d/(d*x+c))-b*e)*a^3+1/3/d^3*B*g^2*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)
*c^3+1/d*B*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*f^2*c+e*B*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f^2*a+1/3*e^3*B*g^2*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^3+B*g/b^2*ln(d*(
b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2*f-1/3*e*B*g^2/b^2/(d*e/(d*x+c)*a-e/(d
*x+c)*b*c)*a^3+e^2*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*f+1/6*e^2*B*g^2/
b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3-1/d^2*B*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-b*e)*c^2*f*g-e^2/d^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+
c)*a-e/(d*x+c)*b*c)^2*c^3*b^2+e/d^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/
(d*x+c)*a-e/(d*x+c)*b*c)*c^2*g^2*a-e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)*f^2*b*c-e^2/d*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2*c-1/3*e^3/d^3*B*g^2*ln(b*e/d+(a*d-
b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*c^3*b^3+e^3/d^2*A*g^2/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a*b^2*c^2-2*e/d*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c
)*c*f*g*a-2*e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*
c)*f^2/(d*x+c)*a*c-20/3*e^3*B*g^2*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x
+c)*a-e/(d*x+c)*b*c)^3*a^3*c^3/(d*x+c)^3-e/d^3*B*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*g^2*b+2*e^2/d^2*A*g^2/(d*e/(d*x+c)*
a-e/(d*x+c)*b*c)^2*a*c^2*b+e^2/d^2*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^2*
c^2*f+1/2*e^2/d^2*B*g^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*c^2*b-e^3/d*A*g^2
/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^3*a^2*b*c+e/d^2*B*g/(d*e/(d*x+c)*a-e/(d*x+c)
*b*c)*c^2*f*b+2*e/d^2*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*f*g*b-2*e/d*B*g/(
d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c*f*a+4*e^2/d*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+
c))*b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^3*f/(d*x+c)^2*a+4*e^2*d*B*g*ln(b*e/
d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3*f/(d*x+c)^2*
c
```

Maxima [A] time = 1.1324, size = 354, normalized size = 2.36

$$\frac{1}{3}Ag^2x^3 + Afgx^2 + \left(x\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) + \frac{a\log(bx+a)}{b} - \frac{c\log(dx+c)}{d}\right)Bf^2 + \left(x^2\log\left(\frac{bex}{dx+c} + \frac{ae}{dx+c}\right) - \frac{a^2 l}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/3*A*g^2*x^3 + A*f*g*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log
(b*x + a)/b - c*log(d*x + c)/d)*B*f^2 + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x
 + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))
*B*f*g + 1/6*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x +
a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a
^2*d^2)*x)/(b^2*d^2))*B*g^2 + A*f^2*x
```

Fricas [A] time = 1.31593, size = 581, normalized size = 3.87

$$\frac{2\,Ab^3d^3g^2x^3 + \left(6\,Ab^3d^3fg - \left(Bb^3cd^2 - Bab^2d^3\right)g^2\right)x^2 + 2\left(3\,Ab^3d^3f^2 - 3\left(Bb^3cd^2 - Bab^2d^3\right)fg + \left(Bb^3c^2d - Ba^2bd^3\right)g^2\right)x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/6*(2*A*b^3*d^3*g^2*x^3 + (6*A*b^3*d^3*f*g - (B*b^3*c*d^2 - B*a*b^2*d^3)*g
^2)*x^2 + 2*(3*A*b^3*d^3*f^2 - 3*(B*b^3*c*d^2 - B*a*b^2*d^3)*f*g + (B*b^3*c
^2*d - B*a^2*b*d^3)*g^2)*x + 2*(3*B*a*b^2*d^3*f^2 - 3*B*a^2*b*d^3*f*g + B*a
^3*d^3*g^2)*log(b*x + a) - 2*(3*B*b^3*c*d^2*f^2 - 3*B*b^3*c^2*d*f*g + B*b^3
*c^3*g^2)*log(d*x + c) + 2*(B*b^3*d^3*g^2*x^3 + 3*B*b^3*d^3*f*g*x^2 + 3*B*b
^3*d^3*f^2*x)*log((b*e*x + a*e)/(d*x + c)))/(b^3*d^3)
```

Sympy [B] time = 10.6912, size = 688, normalized size = 4.59

$$\frac{Ag^2x^3}{3} + \frac{Ba\left(a^2g^2 - 3abfg + 3b^2f^2\right)\log\left(x + \frac{Ba^3cd^2g^2 - 3Ba^2bcd^2fg + \frac{Ba^2d^3\left(a^2g^2 - 3abfg + 3b^2f^2\right)}{b} + Bab^2c^3g^2 - 3Bab^2c^2dfg + 6Bab^2cd^2f^2 - Bacd^2\left(a^2g^2\right.}{Ba^3d^3g^2 - 3Ba^2bd^3fg + 3Bab^2d^3f^2 + Bb^3c^3g^2 - 3Bb^3c^2dfg + 3Bb^3cd^2f^2}\right.}{3b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g**2*x**3/3 + B*a*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2)*log(x + (B*a**3*c
*d**2*g**2 - 3*B*a**2*b*c*d**2*f*g + B*a**2*d**3*(a**2*g**2 - 3*a*b*f*g + 3
```

```
*b**2*f**2)/b + B*a*b**2*c**3*g**2 - 3*B*a*b**2*c**2*d*f*g + 6*B*a*b**2*c*d
**2*f**2 - B*a*c*d**2*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2))/(B*a**3*d**3*g
**2 - 3*B*a**2*b*d**3*f*g + 3*B*a*b**2*d**3*f**2 + B*b**3*c**3*g**2 - 3*B*b
**3*c**2*d*f*g + 3*B*b**3*c*d**2*f**2))/(3*b**3) - B*c*(c**2*g**2 - 3*c*d*f
*g + 3*d**2*f**2)*log(x + (B*a**3*c*d**2*g**2 - 3*B*a**2*b*c*d**2*f*g + B*a
*b**2*c**3*g**2 - 3*B*a*b**2*c**2*d*f*g + 6*B*a*b**2*c*d**2*f**2 - B*a*b**2
*c*(c**2*g**2 - 3*c*d*f*g + 3*d**2*f**2) + B*b**3*c**2*(c**2*g**2 - 3*c*d*f
*g + 3*d**2*f**2)/d)/(B*a**3*d**3*g**2 - 3*B*a**2*b*d**3*f*g + 3*B*a*b**2*d
**3*f**2 + B*b**3*c**3*g**2 - 3*B*b**3*c**2*d*f*g + 3*B*b**3*c*d**2*f**2))/
(3*d**3) + (B*f**2*x + B*f*g*x**2 + B*g**2*x**3/3)*log(e*(a + b*x)/(c + d*x
)) + x**2*(6*A*b*d*f*g + B*a*d*g**2 - B*b*c*g**2)/(6*b*d) - x*(-3*A*b**2*d*
*2*f**2 + B*a**2*d**2*g**2 - 3*B*a*b*d**2*f*g - B*b**2*c**2*g**2 + 3*B*b**2
*c*d*f*g)/(3*b**2*d**2)
```

Giac [A] time = 15.9632, size = 346, normalized size = 2.31

$$\frac{1}{3}\left(Ag^2+Bg^2\right)x^3+\frac{1}{3}\left(Bg^2x^3+3\,Bfgx^2+3\,Bf^2x\right)\log\left(\frac{bx+a}{dx+c}\right)+\frac{\left(6\,Abdfg+6\,Bbdfg-Bbcg^2+Badg^2\right)x^2}{6\,bd}+\frac{\left(3\,Bab^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/3*(A*g^2 + B*g^2)*x^3 + 1/3*(B*g^2*x^3 + 3*B*f*g*x^2 + 3*B*f^2*x)*log((b*
x + a)/(d*x + c)) + 1/6*(6*A*b*d*f*g + 6*B*b*d*f*g - B*b*c*g^2 + B*a*d*g^2)
*x^2/(b*d) + 1/3*(3*B*a*b^2*f^2 - 3*B*a^2*b*f*g + B*a^3*g^2)*log(b*x + a)/b
^3 - 1/3*(3*B*c*d^2*f^2 - 3*B*c^2*d*f*g + B*c^3*g^2)*log(-d*x - c)/d^3 + 1/
3*(3*A*b^2*d^2*f^2 + 3*B*b^2*d^2*f^2 - 3*B*b^2*c*d*f*g + 3*B*a*b*d^2*f*g +
B*b^2*c^2*g^2 - B*a^2*d^2*g^2)*x/(b^2*d^2)
```

3.233 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx$

Optimal. Leaf size=109

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgx(bc-ad)}{2bd}+\frac{B(df-cg)^2\log(c+dx)}{2d^2g}$$

```
[Out] -(B*(b*c - a*d)*g*x)/(2*b*d) - (B*(b*f - a*g)^2*Log[a + b*x])/(2*b^2*g) + (
(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*g) + (B*(d*f - c*g)^2*
Log[c + d*x])/(2*d^2*g)
```

Rubi [A] time = 0.0975082, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{2b^2g}-\frac{Bgx(bc-ad)}{2bd}+\frac{B(df-cg)^2\log(c+dx)}{2d^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] -(B*(b*c - a*d)*g*x)/(2*b*d) - (B*(b*f - a*g)^2*Log[a + b*x])/(2*b^2*g) + (
(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*g) + (B*(d*f - c*g)^2*
Log[c + d*x])/(2*d^2*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx=\frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}-\frac{B\int\frac{(bc-ad)(f+gx)^2}{(a+bx)(c+dx)}dx}{2g}$$
$$=\frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}-\frac{(B(bc-ad))\int\frac{(f+gx)^2}{(a+bx)(c+dx)}dx}{2g}$$
$$=\frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}-\frac{(B(bc-ad))\int\left(\frac{g^2}{bd}+\frac{(bf-ag)^2}{b(bc-ad)(a+bx)}+\frac{(df-c}{d(-bc+ad}\right.}{2g}$$
$$=-\frac{B(bc-ad)gx}{2bd}-\frac{B(bf-ag)^2\log(a+bx)}{2b^2g}+\frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2g}+$$

Mathematica [A] time = 0.107345, size = 114, normalized size = 1.05

$$\frac{b\left(d\left(Bg^2x(ad-bc)+Abd(f+gx)^2\right)+bBd^2(f+gx)^2\log\left(\frac{e(a+bx)}{c+dx}\right)+bB(df-cg)^2\log(c+dx)\right)-Bd^2(bf-ag)^2\log(a+}{2b^2d^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] (-(B*d^2*(b*f - a*g)^2*Log[a + b*x]) + b*(d*(B*(-(b*c) + a*d)*g^2*x + A*b*d
*(f + g*x)^2) + b*B*d^2*(f + g*x)^2*Log[(e*(a + b*x))/(c + d*x)] + b*B*(d*f
 - c*g)^2*Log[c + d*x]))/(2*b^2*d^2*g)
```

Maple [B] time = 0.174, size = 1809, normalized size = 16.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f*a+1/2*e
^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2+
1/2*e*B*g/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a^2-e/d*B*ln(b*e/d+(a*d-b*c)*e/d/
(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c*g*a-3*e^2*B*g*ln(b*e/d+(a*d-b*c)*e
/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^2/(d*x+c)^2*c^2+1/2*e^2/d^2*B
*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*c^2+
e/d^2*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*g
*b-e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f*b*
c-2*e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f/(d*
x+c)*a*c+1/2*e^2/d^2*A*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*b^2*c^2-e/d*A/(d*e
/(d*x+c)*a-e/(d*x+c)*b*c)*c*g*a-e/d*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*a*c+1
/2*e/d^2*B*g/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*b+e/d^2*A/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)*c^2*g*b+e*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f*a+1/2*B*g/b^2*ln(d*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a^2-B/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))-b*e)*f*a-1/2/d^2*B*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*c^2*g+1/d*B*l
n(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*f*c+2*e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(
d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^2*g/(d*x+c)*a-1/2*e^2*d^2*B*g*ln(b*
e/d+(a*d-b*c)*e/d/(d*x+c))/b^2/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^4/(d*x+c)^
2-1/2*e^2/d^2*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*b^2/(d*e/(d*x+c)*a-e/(d*x
+c)*b*c)^2*c^4/(d*x+c)^2+e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)
*a-e/(d*x+c)*b*c)*f/(d*x+c)*c^2*b-e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*
e/(d*x+c)*a-e/(d*x+c)*b*c)*c*g/(d*x+c)*a^2+e*d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f/(d*x+c)*a^2-e/d^2*B*ln(b*e/d+(a*d-b
*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*c^3*g/(d*x+c)*b-e^2/d*A*g/(d
*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*b*c-e^2/d*B*g*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a*b*c+2*e^2*d*B*g*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a^3/(d*x+c)^2*c+2*e^2/d*B*g*ln(
b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)^2*a/(d*x+c)^2*c^
3*b-e/d*A/(d*e/(d*x+c)*a-e/(d*x+c)*b*c)*f*b*c+1/2*e^2*A*g/(d*e/(d*x+c)*a-e/
(d*x+c)*b*c)^2*a^2
```

Maxima [A] time = 1.19729, size = 189, normalized size = 1.73

$$\frac{1}{2}\,Agx^2+\left(x\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)+\frac{a\log\left(bx+a\right)}{b}-\frac{c\log\left(dx+c\right)}{d}\right)Bf+\frac{1}{2}\left(x^2\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)-\frac{a^2\log\left(bx+a\right)}{b^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] 1/2*A*g*x^2 + (x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b -
c*log(d*x + c)/d)*B*f + 1/2*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2
*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*B*g + A*f*x
```

Fricas [A] time = 1.35456, size = 321, normalized size = 2.94

$$\frac{Ab^2d^2gx^2 + \left(2\,Ab^2d^2f - \left(Bb^2cd - Babd^2\right)g\right)x + \left(2\,Babd^2f - Ba^2d^2g\right)\log\left(bx+a\right) - \left(2\,Bb^2cdf - Bb^2c^2g\right)\log\left(dx+c\right) +}{2\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + (2*A*b^2*d^2*f - (B*b^2*c*d - B*a*b*d^2)*g)*x + (2*B
*a*b*d^2*f - B*a^2*d^2*g)*log(b*x + a) - (2*B*b^2*c*d*f - B*b^2*c^2*g)*log(
d*x + c) + (B*b^2*d^2*g*x^2 + 2*B*b^2*d^2*f*x)*log((b*e*x + a*e)/(d*x + c))
)/(b^2*d^2)
```

Sympy [B] time = 4.78579, size = 325, normalized size = 2.98

$$\frac{Agx^2}{2} - \frac{Ba\left(ag-2bf\right)\log\left(x + \frac{Ba^2cdg + \frac{Ba^2d^2\left(ag-2bf\right)}{b} + Babc^2g - 4Babcdf - Bacd\left(ag-2bf\right)}{Ba^2d^2g - 2Babd^2f + Bb^2c^2g - 2Bb^2cdf}\right)}{2b^2} + \frac{Bc\left(cg-2df\right)\log\left(x + \frac{Ba^2cdg + Babc^2g - 4Bab}{Ba^2d^2g - 2B}\right.}{2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] A*g*x**2/2 - B*a*(a*g - 2*b*f)*log(x + (B*a**2*c*d*g + B*a**2*d**2*(a*g - 2
*b*f)/b + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*c*d*(a*g - 2*b*f))/(B*a**2*d**
2*g - 2*B*a*b*d**2*f + B*b**2*c**2*g - 2*B*b**2*c*d*f))/(2*b**2) + B*c*(c*g
 - 2*d*f)*log(x + (B*a**2*c*d*g + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*b*c*(c
*g - 2*d*f) + B*b**2*c**2*(c*g - 2*d*f)/d)/(B*a**2*d**2*g - 2*B*a*b*d**2*f
+ B*b**2*c**2*g - 2*B*b**2*c*d*f))/(2*d**2) + (B*f*x + B*g*x**2/2)*log(e*(a
 + b*x)/(c + d*x)) + x*(2*A*b*d*f + B*a*d*g - B*b*c*g)/(2*b*d)
```

Giac [A] time = 2.52862, size = 171, normalized size = 1.57

$$\frac{1}{2}\left(Ag+Bg\right)x^{2}+\frac{1}{2}\left(Bgx^{2}+2\,Bfx\right)\log\left(\frac{bx+a}{dx+c}\right)+\frac{\left(2\,Abdf+2\,Bbdf-Bbcg+Badg\right)x}{2\,bd}+\frac{\left(2\,Babf-Ba^{2}g\right)\log\left(bx+a\right)}{2\,b^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] 1/2*(A*g + B*g)*x^2 + 1/2*(B*g*x^2 + 2*B*f*x)*log((b*x + a)/(d*x + c)) + 1/
2*(2*A*b*d*f + 2*B*b*d*f - B*b*c*g + B*a*d*g)*x/(b*d) + 1/2*(2*B*a*b*f - B*
a^2*g)*log(b*x + a)/b^2 - 1/2*(2*B*c*d*f - B*c^2*g)*log(-d*x - c)/d^2
```

3.234 $\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\,dx$

Optimal. Leaf size=52

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/b - (B*(b*c - a*d)*Log[c +
 d*x])/(b*d)
```

Rubi [A] time = 0.027389, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[(e*(a + b*x))/(c + d*x)],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/b - (B*(b*c - a*d)*Log[c +
 d*x])/(b*d)
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx = Ax+B\int \log\left(\frac{e(a+bx)}{c+dx}\right)dx$$
$$= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{(B(bc-ad))\int \frac{1}{c+dx}dx}{b}$$
$$= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}$$

Mathematica [A] time = 0.007627, size = 52, normalized size = 1.

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b}-\frac{B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[(e*(a + b*x))/(c + d*x)],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/b - (B*(b*c - a*d)*Log[c +
 d*x])/(b*d)
```

Maple [B] time = 0.149, size = 418, normalized size = 8.

$$Ax-\frac{Ba}{b}\ln\left(d\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)-be\right)+\frac{Bc}{d}\ln\left(d\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)-be\right)+eBa\ln\left(\frac{be}{d}+\frac{e\,(ad-bc)}{(dx+c)\,d}\right)\left(\frac{ade}{dx+c}-\frac{bec}{dx+c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A+B*ln(e*(b*x+a)/(d*x+c)),x)
```

```
[Out] A*x-B/b*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+B/d*ln(d*(b*e/d+(a*d-b*c)
*e/d/(d*x+c))-b*e)*c+e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(
d*x+c)*b*c)*a-e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d*x+c)*
b*c)/d*b*c+e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/b/(d*e/(d*x+c)*a-e/(d*x+c)*b
*c)/(d*x+c)*a^2*d-2*e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e/(d
*x+c)*b*c)/(d*x+c)*a*c+e*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(d*e/(d*x+c)*a-e
/(d*x+c)*b*c)/d/(d*x+c)*c^2*b
```

Maxima [A] time = 1.16848, size = 73, normalized size = 1.4

$$\left(x\log\left(\frac{(bx+a)e}{dx+c}\right)+\frac{\frac{ae\log(bx+a)}{b}-\frac{ce\log(dx+c)}{d}}{e}\right)B+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)/(d*x+c)),x, algorithm="maxima")
```

```
[Out] (x*log((b*x + a)*e/(d*x + c)) + (a*e*log(b*x + a)/b - c*e*log(d*x + c)/d)/e
)*B + A*x
```

Fricas [A] time = 1.30415, size = 132, normalized size = 2.54

$$\frac{Bbdx\log\left(\frac{bex+ae}{dx+c}\right)+Abdx+Bad\log(bx+a)-Bbc\log(dx+c)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)/(d*x+c)),x, algorithm="fricas")
```

```
[Out] (B*b*d*x*log((b*e*x + a*e)/(d*x + c)) + A*b*d*x + B*a*d*log(b*x + a) - B*b*
c*log(d*x + c))/(b*d)
```

Sympy [A] time = 1.16599, size = 83, normalized size = 1.6

$$Ax+\frac{Ba\log\left(x+\frac{\frac{Ba^2d}{b}+Bac}{Bad+Bbc}\right)}{b}-\frac{Bc\log\left(x+\frac{Bac+\frac{Bbc^2}{d}}{Bad+Bbc}\right)}{d}+Bx\log\left(\frac{e(a+bx)}{c+dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*(b*x+a)/(d*x+c)),x)
```

```
[Out] A*x + B*a*log(x + (B*a**2*d/b + B*a*c)/(B*a*d + B*b*c))/b - B*c*log(x + (B*
a*c + B*b*c**2/d)/(B*a*d + B*b*c))/d + B*x*log(e*(a + b*x)/(c + d*x))
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)/(d*x+c)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.235 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{f+gx}\,dx$

Optimal. Leaf size=140

$$-\frac{B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}-\frac{B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}+$$

```
[Out] -((B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g) + ((A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[f + g*x])/g + (B*Log[-((g*(c + d*x))/(d*f - c*g))]
*Log[f + g*x])/g - (B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (B*PolyLog
[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Rubi [A] time = 0.246955, antiderivative size = 140, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {2524, 12, 2418, 2394, 2393, 2391}

$$-\frac{B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}-\frac{B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}+$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x),x]
```


```
[Out] -((B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g) + ((A + B*Log[(e*(a
 + b*x))/(c + d*x)])*Log[f + g*x])/g + (B*Log[-((g*(c + d*x))/(d*f - c*g))]
*Log[f + g*x])/g - (B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (B*PolyLog
[2, (d*(f + g*x))/(d*f - c*g)])/g
```


Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{f+gx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(f+gx)}{e(a+bx)}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} - \frac{B\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\log(f+gx)}{a+bx}\,dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} - \frac{B\int \left(\frac{be\log(f+gx)}{a+bx}-\frac{de\log(f+gx)}{c+dx}\right)dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} - \frac{(bB)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} + \frac{(Bd)\int \frac{\log(f+gx)}{c+dx}\,dx}{g}$$

$$= -\frac{B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} + \frac{B\log\left(-\frac{g(c+dx)}{df-cg}\right)\log(f}{g}$$

$$= -\frac{B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} + \frac{B\log\left(-\frac{g(c+dx)}{df-cg}\right)\log(f}{g}$$

$$= -\frac{B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{g} + \frac{B\log\left(-\frac{g(c+dx)}{df-cg}\right)\log(f}{g}$$

Mathematica [A] time = 0.0571215, size = 115, normalized size = 0.82

$$\frac{-B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)+B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)+\log(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)-B\log\left(\frac{g(a+bx)}{ag-bf}\right)+A+B\log\left(\frac{g(c+dx)}{cg-df}\right)\right)}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x),x]
```

```
[Out] ((A - B*Log[(g*(a + b*x))/(-(b*f) + a*g)] + B*Log[(e*(a + b*x))/(c + d*x)]
+ B*Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] - B*PolyLog[2, (b*(f +
g*x))/(b*f - a*g)] + B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Maple [B] time = 0.545, size = 1400, normalized size = 10.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f),x)
```

```
[Out] d*A/g/(a*d-b*c)*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*c*g-d*f*(b*e/d+(a*d-b*c)*e
/d/(d*x+c))-a*e*g+b*e*f)*a-A/g/(a*d-b*c)*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*c
*g-d*f*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)*b*c-d*A/g/(a*d-b*c)*ln(d*
(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)*a+A/g/(a*d-b*c)*ln(d*(b*e/d+(a*d-b*c)*e/
d/(d*x+c))-b*e)*b*c+d*B/(a*d-b*c)*dilog(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*
x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c*a-B/(a*d-b*c)*dilog(((c*g-d*
f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c^2
*b-d^2*B/g/(a*d-b*c)*dilog(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b
*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*f*a+d*B/g/(a*d-b*c)*dilog(((c*g-d*f)*(b*e/d
+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*f*b*c+d*B/(a
*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c*a-B/(a*d-b*c)*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))*ln(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*
f)/(-a*e*g+b*e*f))/(c*g-d*f)*c^2*b-d^2*B/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d
/(d*x+c))*ln(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+
b*e*f))/(c*g-d*f)*f*a+d*B/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(((
c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*
f)*f*b*c-d*B/g/(a*d-b*c)*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*
a+B/g/(a*d-b*c)*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-d*B/g
/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x
+c))-b*e)/b/e)*a+B/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/
d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B\int -\frac{\log\left(bx+a\right)-\log\left(dx+c\right)+\log\left(e\right)}{gx+f}\,dx+\frac{A\log\left(gx+f\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(log(b*x + a) - log(d*x + c) + log(e))/(g*x + f), x) + A*log(
g*x + f)/g
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(\frac{bex+ae}{dx+c}\right)+A}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*e*x + a*e)/(d*x + c)) + A)/(g*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)/(g*x + f), x)
```

3.236 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^2}\,dx$

Optimal. Leaf size=87

$$\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{(f+gx)(bf-ag)}+\frac{B(bc-ad)\log\left(\frac{f+gx}{c+dx}\right)}{(bf-ag)(df-cg)}$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*f - a*g)*(f + g*x)) +
(B*(b*c - a*d)*Log[(f + g*x)/(c + d*x)])/((b*f - a*g)*(d*f - c*g))
```

Rubi [A] time = 0.105829, antiderivative size = 113, normalized size of antiderivative = 1.3, number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{g(f+gx)}+\frac{B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}+\frac{bB\log(a+bx)}{g(bf-ag)}-\frac{Bd\log(c+dx)}{g(df-cg)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^2,x]
```

```
[Out] (b*B*Log[a + b*x])/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(
g*(f + g*x)) - (B*d*Log[c + d*x])/(g*(d*f - c*g)) + (B*(b*c - a*d)*Log[f +
g*x])/((b*f - a*g)*(d*f - c*g))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^2}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}+\frac{B\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}+\frac{(B(bc-ad))\int\left(\frac{b^2}{(bc-ad)(bf-ag)(a+bx)}+\frac{d^2}{(bc-ad)(-df+cg)(c+dx)}+\frac{g^2}{(bf-ag)(df-c}\right.}{g}$$

$$= \frac{bB\log(a+bx)}{g(bf-ag)}-\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{g(f+gx)}-\frac{Bd\log(c+dx)}{g(df-cg)}+\frac{B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}$$

Mathematica [A] time = 0.151138, size = 105, normalized size = 1.21

$$\frac{\frac{B(b\log(a+bx)(df-cg)+\log(c+dx)(adg-bdf)+g(bc-ad)\log(f+gx))}{(bf-ag)(df-cg)}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{f+gx}}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)) + (B*(b*(d*f - c*g)*Log[
a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]))/(
(b*f - a*g)*(d*f - c*g)))/g
```

Maple [B] time = 0.149, size = 926, normalized size = 10.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x)
```

```
[Out] e*d*A/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)*b*c^2*g+e/(d*x
+c)*b*c*f-a*e*g)/(c*g-d*f)*a-e*A/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f
-e/d/(d*x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)/(c*g-d*f)*b*c-d*B/(a*g-b*f)*ln(
(c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(c*g-d*f)*a+B/(a*g-b*f
)*ln((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(c*g-d*f)*b*c+e*B
*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))/(a*g-b*f)/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*
x+c)*a*d*f-e/d/(d*x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)*b*a-e/d*B*ln(b*e/d+(a
*d-b*c)*e/d/(d*x+c))/(a*g-b*f)/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e
/d/(d*x+c)*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)*b^2*c+e*d*B*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))/(a*g-b*f)/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)
*b*c^2*g+e/(d*x+c)*b*c*f-a*e*g)/(d*x+c)*a^2-2*e*B*ln(b*e/d+(a*d-b*c)*e/d/(d
*x+c))/(a*g-b*f)/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)*b*c
^2*g+e/(d*x+c)*b*c*f-a*e*g)/(d*x+c)*a*b*c+e/d*B*ln(b*e/d+(a*d-b*c)*e/d/(d*x
+c))/(a*g-b*f)/(b*e/d*c*g+e/(d*x+c)*a*c*g-e/(d*x+c)*a*d*f-e/d/(d*x+c)*b*c^2
*g+e/(d*x+c)*b*c*f-a*e*g)/(d*x+c)*b^2*c^2
```

Maxima [A] time = 1.12098, size = 186, normalized size = 2.14

$$B\left(\frac{b\log\left(bx+a\right)}{bfg-ag^2}-\frac{d\log\left(dx+c\right)}{dfg-cg^2}+\frac{(bc-ad)\log\left(gx+f\right)}{bdf^2+acg^2-(bc+ad)fg}-\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{g^2x+fg}\right)-\frac{A}{g^2x+fg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] B*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) + (b*c -
 a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b*e*x/(d*x +
 c) + a*e/(d*x + c))/(g^2*x + f*g)) - A/(g^2*x + f*g)
```

Fricas [B] time = 21.9531, size = 559, normalized size = 6.43

$$-\frac{Abdf^2+Aacg^2-(Abc+Aad)fg-\left(Bbdf^2-Bbcfg+\left(Bbdfg-Bbcg^2\right)x\right)\log\left(bx+a\right)+\left(Bbdf^2-Badfg+\left(Bbdfg-\right.\right.}{bdf^3g+acfg^3-(bc+ad)f^2g^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] -(A*b*d*f^2 + A*a*c*g^2 - (A*b*c + A*a*d)*f*g - (B*b*d*f^2 - B*b*c*f*g + (B
*b*d*f*g - B*b*c*g^2)*x)*log(b*x + a) + (B*b*d*f^2 - B*a*d*f*g + (B*b*d*f*g
 - B*a*d*g^2)*x)*log(d*x + c) - ((B*b*c - B*a*d)*g^2*x + (B*b*c - B*a*d)*f*
g)*log(g*x + f) + (B*b*d*f^2 + B*a*c*g^2 - (B*b*c + B*a*d)*f*g)*log((b*e*x
+ a*e)/(d*x + c)))/(b*d*f^3*g + a*c*f*g^3 - (b*c + a*d)*f^2*g^2 + (b*d*f^2*
g^2 + a*c*g^4 - (b*c + a*d)*f*g^3)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.31311, size = 378, normalized size = 4.34

$$\frac{(Bbc - Bad)\log\left(gx + f\right)}{bdf^2 - bcfg - adfg + acg^2} - \frac{B\log\left(\frac{bx+a}{dx+c}\right)}{g^2x + fg} - \frac{(Bbc - Bad)\log\left(\left|bdx^2 + bcx + adx + ac\right|\right)}{2\left(bdf^2 - bcfg - adfg + acg^2\right)} - \frac{A + B}{g^2x + fg} + \frac{\left(2\,Bb^2cdf - 2\,Ba\right.}{2\left(ba\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] (B*b*c - B*a*d)*log(g*x + f)/(b*d*f^2 - b*c*f*g - a*d*f*g + a*c*g^2) - B*lo
g((b*x + a)/(d*x + c))/(g^2*x + f*g) - 1/2*(B*b*c - B*a*d)*log(abs(b*d*x^2
+ b*c*x + a*d*x + a*c))/(b*d*f^2 - b*c*f*g - a*d*f*g + a*c*g^2) - (A + B)/(
g^2*x + f*g) + 1/2*(2*B*b^2*c*d*f - 2*B*a*b*d^2*f - B*b^2*c^2*g + B*a^2*d^2
*g)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d +
abs(-b*c + a*d))))/((b*d*f^2*g - b*c*f*g^2 - a*d*f*g^2 + a*c*g^3)*abs(-b*c
+ a*d))
```

3.237 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^3}\,dx$

Optimal. Leaf size=183

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)}{2(bf-ag)^2(df-cg)^2}-$$

```
[Out] -(B*(b*c - a*d))/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*Log[a + b*x
])/(2*g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*g*(f + g*x
)^2) - (B*d^2*Log[c + d*x])/(2*g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f -
 b*c*g - a*d*g)*Log[f + g*x])/(2*(b*f - a*g)^2*(d*f - c*g)^2)
```

Rubi [A] time = 0.185454, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{2g(bf-ag)^2}-\frac{B(bc-ad)}{2(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)}{2(bf-ag)^2(df-cg)^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^3,x]
```

```
[Out] -(B*(b*c - a*d))/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*Log[a + b*x
])/(2*g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(2*g*(f + g*x
)^2) - (B*d^2*Log[c + d*x])/(2*g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f -
 b*c*g - a*d*g)*Log[f + g*x])/(2*(b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^3}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2} + \frac{B\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2} + \frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2} + \frac{(B(bc-ad))\int \left(\frac{b^3}{(bc-ad)(bf-ag)^2(a+bx)} - \frac{d^3}{(bc-ad)(-df+cg)^2(c+dx)} + \frac{g}{(bf-ag)(df}\right.}{2g}$$

$$= -\frac{B(bc-ad)}{2(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)}{2g(bf-ag)^2} - \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{2g(f+gx)^2} - \frac{Bd^2\log(c+dx)}{2g(df-cg)^2} +$$

Mathematica [A] time = 0.645492, size = 169, normalized size = 0.92

$$\frac{B(bc-ad)\left(\frac{b^2\log(a+bx)}{(bc-ad)(bf-ag)^2} + \frac{\frac{d^2\log(c+dx)}{ad-bc} + \frac{g(cg-df)}{(f+gx)(bf-ag)} - \frac{g\log(f+gx)(adg+bcg-2bdf)}{(bf-ag)^2}}{(df-cg)^2}\right) - \frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{(f+gx)^2}}{2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^3,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^2) + B*(b*c - a*d)*((b^2*
Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + ((g*(-(d*f) + c*g))/((b*f - a*g
)*(f + g*x)) + (d^2*Log[c + d*x])/(-(b*c) + a*d) - (g*(-2*b*d*f + b*c*g + a
*d*g)*Log[f + g*x])/(b*f - a*g)^2)/(d*f - c*g)^2))/(2*g)
```

Maple [B] time = 0.175, size = 5274, normalized size = 28.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.24118, size = 474, normalized size = 2.59

$$\frac{1}{2}\left(\frac{b^2\log(bx+a)}{b^2f^2g-2\,abfg^2+a^2g^3}-\frac{d^2\log(dx+c)}{d^2f^2g-2\,cdfg^2+c^2g^3}+\frac{\left(2\left(b^2cd-abd^2\right)f-\left(b^2c^2-a^2d^2\right)g\right)\log\left(gx\right.}{b^2d^2f^4+a^2c^2g^4-2\left(b^2cd+abd^2\right)f^3g+\left(b^2c^2+4\,abcd+a^2d^2\right)f}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c
)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2
 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d
^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)
*f*g^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g
 + a*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b*e*x/(d*x + c) + a*e/(d*x + c))/(
g^3*x^2 + 2*f*g^2*x + f^2*g))*B - 1/2*A/(g^3*x^2 + 2*f*g^2*x + f^2*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.74853, size = 1110, normalized size = 6.07

$$\frac{\left(2\,Bb^2cdf-2\,Babd^2f-Bb^2c^2g+Ba^2d^2g\right)\log\left(gx+f\right)}{2\left(b^2d^2f^4-2\,b^2cdf^3g-2\,abd^2f^3g+b^2c^2f^2g^2+4\,abcdf^2g^2+a^2d^2f^2g^2-2\,abc^2fg^3-2\,a^2cdfg^3+a^2c^2g^4\right)}-\frac{B\,\mathrm{lo}}{2\left(g^3x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*B*b^2*c*d*f - 2*B*a*b*d^2*f - B*b^2*c^2*g + B*a^2*d^2*g)*log(g*x + f
)/(b^2*d^2*f^4 - 2*b^2*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*
b*c*d*f^2*g^2 + a^2*d^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c
^2*g^4) - 1/2*B*log((b*x + a)/(d*x + c))/(g^3*x^2 + 2*f*g^2*x + f^2*g) - 1/
4*(2*B*b^2*c*d*f - 2*B*a*b*d^2*f - B*b^2*c^2*g + B*a^2*d^2*g)*log(abs(b*d*x
^2 + b*c*x + a*d*x + a*c))/(b^2*d^2*f^4 - 2*b^2*c*d*f^3*g - 2*a*b*d^2*f^3*g
 + b^2*c^2*f^2*g^2 + 4*a*b*c*d*f^2*g^2 + a^2*d^2*f^2*g^2 - 2*a*b*c^2*f*g^3
- 2*a^2*c*d*f*g^3 + a^2*c^2*g^4) - 1/2*(B*b*c*g^2*x - B*a*d*g^2*x + A*b*d*f
^2 + B*b*d*f^2 - A*b*c*f*g - A*a*d*f*g - 2*B*a*d*f*g + A*a*c*g^2 + B*a*c*g^
2)/(b*d*f^2*g^3*x^2 - b*c*f*g^4*x^2 - a*d*f*g^4*x^2 + a*c*g^5*x^2 + 2*b*d*f
^3*g^2*x - 2*b*c*f^2*g^3*x - 2*a*d*f^2*g^3*x + 2*a*c*f*g^4*x + b*d*f^4*g -
b*c*f^3*g^2 - a*d*f^3*g^2 + a*c*f^2*g^3) + 1/4*(2*B*b^3*c*d^2*f^2 - 2*B*a*b
^2*d^3*f^2 - 2*B*b^3*c^2*d*f*g + 2*B*a^2*b*d^3*f*g + B*b^3*c^3*g^2 - B*a*b^
2*c^2*d*g^2 + B*a^2*b*c*d^2*g^2 - B*a^3*d^3*g^2)*log(abs((2*b*d*x + b*c + a
*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/((b^2*d^2*f
^4*g - 2*b^2*c*d*f^3*g^2 - 2*a*b*d^2*f^3*g^2 + b^2*c^2*f^2*g^3 + 4*a*b*c*d*
f^2*g^3 + a^2*d^2*f^2*g^3 - 2*a*b*c^2*f*g^4 - 2*a^2*c*d*f*g^4 + a^2*c^2*g^5
)*abs(-b*c + a*d))
```

3.238 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^4}\,dx$

Optimal. Leaf size=275

$$\frac{B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3g(f+gx)^3}+\frac{b^3B\log(a+bx)}{3g(bf-ag)^3}\cdot$$

```
[Out] -(B*(b*c - a*d))/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*
B*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/
(3*g*(f + g*x)^3) - (B*d^3*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (B*(b*c - a*
d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*
g^2))*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rubi [A] time = 0.396054, antiderivative size = 275, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$\frac{B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A}{3g(f+gx)^3}+\frac{b^3B\log(a+bx)}{3g(bf-ag)^3}\cdot$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^4,x]
```

```
[Out] -(B*(b*c - a*d))/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*
B*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/
(3*g*(f + g*x)^3) - (B*d^3*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (B*(b*c - a*
d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*
g^2))*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
```

```
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^4}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3g(f+gx)^3}+\frac{B\int\frac{bc-ad}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3g(f+gx)^3}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{3g(f+gx)^3}+\frac{(B(bc-ad))\int\left(\frac{b^4}{(bc-ad)(bf-ag)^3(a+bx)}+\frac{d^4}{(bc-ad)(-df+cg)^3(c+dx)}+\frac{g}{(bf-ag)(df}\right.}{}$$

$$= -\frac{B(bc-ad)}{6(bf-ag)(df-cg)(f+gx)^2}-\frac{B(bc-ad)(2bdf-bcg-adg)}{3(bf-ag)^2(df-cg)^2(f+gx)}+\frac{b^3B\log(a+bx)}{3g(bf-ag)^3}-\frac{A+}{3g}$$

Mathematica [A] time = 0.926759, size = 260, normalized size = 0.95

$$\frac{B(bc-ad)\left(\frac{g\log(f+gx)\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(bf-ag)^3(df-cg)^3}+\frac{b^3\log(a+bx)}{(bc-ad)(bf-ag)^3}+\frac{d^3\log(c+dx)}{(bc-ad)(cg-df)^3}+\frac{g(adg+bcg-2bdf)}{(f+gx)(bf-ag)^2(df-cg)^2}-\frac{}{2(f+}\right.}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^4,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^3) + B*(b*c - a*d)*(-g/(2
*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (g*(-2*b*d*f + b*c*g + a*d*g))/((b*
f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*Log[a + b*x])/((b*c - a*d)*(b*f
```

```
- a*g)^3) + (d^3*Log[c + d*x])/((b*c - a*d)*(-(d*f) + c*g)^3) + (g*(a^2*d^2
*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[
f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(3*g)
```

Maple [B] time = 0.203, size = 18285, normalized size = 66.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.5379, size = 1145, normalized size = 4.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/6*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - 2*log(b*e*x/(d*x + c) + a*e/(d*
x + c))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*B - 1/3*A/(g^4*x^3 +
 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 4.30114, size = 2765, normalized size = 10.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*B*b^3*c*d^2*f^2 - 3*B*a*b^2*d^3*f^2 - 3*B*b^3*c^2*d*f*g + 3*B*a^2*b*
d^3*f*g + B*b^3*c^3*g^2 - B*a^3*d^3*g^2)*log(g*x + f)/(b^3*d^3*f^6 - 3*b^3*
c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g
^2 + 3*a^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*
b*c*d^2*f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2
*g^4 + 3*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^
3*g^6) - 1/3*B*log((b*x + a)/(d*x + c))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*
x + f^3*g) - 1/6*(3*B*b^3*c*d^2*f^2 - 3*B*a*b^2*d^3*f^2 - 3*B*b^3*c^2*d*f*g
 + 3*B*a^2*b*d^3*f*g + B*b^3*c^3*g^2 - B*a^3*d^3*g^2)*log(abs(b*d*x^2 + b*c
```

*x + a*d*x + a*c))/(b^3*d^3*f^6 - 3*b^3*c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2 + 3*a^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c*d^2*f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2*g^4 + 3*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^3*g^6) - 1/6*(4*B*b^2*c*d*f*g^3*x^2 - 4*B*a*b*d^2*f*g^3*x^2 - 2*B*b^2*c^2*g^4*x^2 + 2*B*a^2*d^2*g^4*x^2 + 9*B*b^2*c*d*f^2*g^2*x - 9*B*a*b*d^2*f^2*g^2*x - 5*B*b^2*c^2*f*g^3*x + 5*B*a^2*d^2*f*g^3*x + B*a*b*c^2*g^4*x - B*a^2*c*d*g^4*x + 2*A*b^2*d^2*f^4 + 2*B*b^2*d^2*f^4 - 4*A*b^2*c*d*f^3*g + B*b^2*c*d*f^3*g - 4*A*a*b*d^2*f^3*g - 9*B*a*b*d^2*f^3*g + 2*A*b^2*c^2*f^2*g^2 - B*b^2*c^2*f^2*g^2 + 8*A*a*b*c*d*f^2*g^2 + 8*B*a*b*c*d*f^2*g^2 + 2*A*a^2*d^2*f^2*g^2 + 5*B*a^2*d^2*f^2*g^2 - 4*A*a*b*c^2*f*g^3 - 3*B*a*b*c^2*f*g^3 - 4*A*a^2*c*d*f*g^3 - 5*B*a^2*c*d*f*g^3 + 2*A*a^2*c^2*g^4 + 2*B*a^2*c^2*g^4)/(b^2*d^2*f^4*g^4*x^3 - 2*b^2*c*d*f^3*g^5*x^3 - 2*a*b*d^2*f^3*g^5*x^3 + b^2*c^2*f^2*g^6*x^3 + 4*a*b*c*d*f^2*g^6*x^3 + a^2*d^2*f^2*g^6*x^3 - 2*a*b*c^2*f*g^7*x^3 - 2*a^2*c*d*f*g^7*x^3 + a^2*c^2*g^8*x^3 + 3*b^2*d^2*f^5*g^3*x^2 - 6*b^2*c*d*f^4*g^4*x^2 - 6*a*b*d^2*f^4*g^4*x^2 + 3*b^2*c^2*f^3*g^5*x^2 + 12*a*b*c*d*f^3*g^5*x^2 + 3*a^2*d^2*f^3*g^5*x^2 - 6*a*b*c^2*f^2*g^6*x^2 - 6*a^2*c*d*f^2*g^6*x^2 + 3*a^2*c^2*f*g^7*x^2 + 3*b^2*d^2*f^6*g^2*x - 6*b^2*c*d*f^5*g^3*x - 6*a*b*d^2*f^5*g^3*x + 3*b^2*c^2*f^4*g^4*x + 12*a*b*c*d*f^4*g^4*x + 3*a^2*d^2*f^4*g^4*x - 6*a*b*c^2*f^3*g^5*x - 6*a^2*c*d*f^3*g^5*x + 3*a^2*c^2*f^2*g^6*x + b^2*d^2*f^7*g - 2*b^2*c*d*f^6*g^2 - 2*a*b*d^2*f^6*g^2 + b^2*c^2*f^5*g^3 + 4*a*b*c*d*f^5*g^3 + a^2*d^2*f^5*g^3 - 2*a*b*c^2*f^4*g^4 - 2*a^2*c*d*f^4*g^4 + a^2*c^2*f^3*g^5) + 1/6*(2*B*b^4*c*d^3*f^3 - 2*B*a*b^3*d^4*f^3 - 3*B*b^4*c^2*d^2*f^2*g + 3*B*a^2*b^2*d^4*f^2*g + 3*B*b^4*c^3*d*f*g^2 - 3*B*a*b^3*c^2*d^2*f*g^2 + 3*B*a^2*b^2*c*d^3*f*g^2 - 3*B*a^3*b*d^4*f*g^2 - B*b^4*c^4*g^3 + B*a*b^3*c^3*d*g^3 - B*a^3*b*c*d^3*g^3 + B*a^4*d^4*g^3)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/((b^3*d^3*f^6*g - 3*b^3*c*d^2*f^5*g^2 - 3*a*b^2*d^3*f^5*g^2 + 3*b^3*c^2*d*f^4*g^3 + 9*a*b^2*c*d^2*f^4*g^3 + 3*a^2*b*d^3*f^4*g^3 - b^3*c^3*f^3*g^4 - 9*a*b^2*c^2*d*f^3*g^4 - 9*a^2*b*c*d^2*f^3*g^4 - a^3*d^3*f^3*g^4 + 3*a*b^2*c^3*f^2*g^5 + 9*a^2*b*c^2*d*f^2*g^5 + 3*a^3*c*d^2*f^2*g^5 - 3*a^2*b*c^3*f*g^6 - 3*a^3*c^2*d*f*g^6 + a^3*c^3*g^7)*abs(-b*c + a*d))

3.239 $\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^5}\,dx$

Optimal. Leaf size=379

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)\left(-a^2\right.}{4(bf-ag}$$

```
[Out] -(B*(b*c - a*d))/(12*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*
(2*b*d*f - b*c*g - a*d*g))/(8*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2)))/(4*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*Log[a +
 b*x])/(4*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(4*g*(f +
 g*x)^4) - (B*d^4*Log[c + d*x])/(4*g*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*b*d
*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f
*g + c^2*g^2))*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rubi [A] time = 0.617712, antiderivative size = 379, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{4(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)\left(-a^2\right.}{4(bf-ag}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^5,x]
```


```
[Out] -(B*(b*c - a*d))/(12*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*
(2*b*d*f - b*c*g - a*d*g))/(8*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B
*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*
f*g + c^2*g^2)))/(4*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*Log[a +
 b*x])/(4*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])/(4*g*(f +
 g*x)^4) - (B*d^4*Log[c + d*x])/(4*g*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*b*d
*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f
*g + c^2*g^2))*Log[f + g*x])/(4*(b*f - a*g)^4*(d*f - c*g)^4)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(f+gx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4g(f+gx)^4}+\frac{B\int \frac{bc-ad}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4g(f+gx)^4}+\frac{(B(bc-ad))\int \frac{1}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{4g(f+gx)^4}+\frac{(B(bc-ad))\int \left(\frac{b^5}{(bc-ad)(bf-ag)^4(a+bx)}-\frac{d^5}{(bc-ad)(-df+cg)^4(c+dx)}+\frac{g^2}{(bf-ag)(df-c}\right.}{}$$

$$= -\frac{B(bc-ad)}{12(bf-ag)(df-cg)(f+gx)^3}-\frac{B(bc-ad)(2bdf-bcg-adg)}{8(bf-ag)^2(df-cg)^2(f+gx)^2}-\frac{B(bc-ad)\left(a^2d^2g^2-ab\right.}{4(bf}$$

Mathematica [A] time = 1.15871, size = 355, normalized size = 0.94

$$\frac{B(bc-ad)\left(-\frac{g\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(f+gx)(bf-ag)^3(df-cg)^3}-\frac{g\log(f+gx)(adg+bcg-2bdf)\left(a^2d^2g^2-2abd^2fg+b^2\left(c^2g^2-2cdfg+2d^2f^2\right)\right)}{(bf-ag)^4(df-cg)^4}+\frac{b^4\log(a-}{(bc-ad)(bf}\right.}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^5,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])/(f + g*x)^4) + B*(b*c - a*d)*(-g/(3
*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) + (g*(-2*b*d*f + b*c*g + a*d*g))/(2*(
b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f
 + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)))/((b*f - a*g)^3*(d*f - c*g
)^3*(f + g*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^4) - (d^4*Log[
c + d*x])/((b*c - a*d)*(d*f - c*g)^4) - (g*(-2*b*d*f + b*c*g + a*d*g)*(-2*a
*b*d^2*f*g + a^2*d^2*g^2 + b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[f + g
*x])/((b*f - a*g)^4*(d*f - c*g)^4)))/(4*g)
```

Maple [B] time = 0.259, size = 44893, normalized size = 118.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.89596, size = 2372, normalized size = 6.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/24*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
```

```
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 6*log(b*e*x/(d*x + c) + a*
e/(d*x + c))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g))
*B - 1/4*A/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))/(g*x+f)**5,x)
```

```
[Out] Timed out
```

Giac [B] time = 11.7247, size = 5516, normalized size = 14.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] 1/4*(4*B*b^4*c*d^3*f^3 - 4*B*a*b^3*d^4*f^3 - 6*B*b^4*c^2*d^2*f^2*g + 6*B*a^
2*b^2*d^4*f^2*g + 4*B*b^4*c^3*d*f*g^2 - 4*B*a^3*b*d^4*f*g^2 - B*b^4*c^4*g^3
 + B*a^4*d^4*g^3)*log(g*x + f)/(b^4*d^4*f^8 - 4*b^4*c*d^3*f^7*g - 4*a*b^3*d
^4*f^7*g + 6*b^4*c^2*d^2*f^6*g^2 + 16*a*b^3*c*d^3*f^6*g^2 + 6*a^2*b^2*d^4*f
^6*g^2 - 4*b^4*c^3*d*f^5*g^3 - 24*a*b^3*c^2*d^2*f^5*g^3 - 24*a^2*b^2*c*d^3*
f^5*g^3 - 4*a^3*b*d^4*f^5*g^3 + b^4*c^4*f^4*g^4 + 16*a*b^3*c^3*d*f^4*g^4 +
36*a^2*b^2*c^2*d^2*f^4*g^4 + 16*a^3*b*c*d^3*f^4*g^4 + a^4*d^4*f^4*g^4 - 4*a
*b^3*c^4*f^3*g^5 - 24*a^2*b^2*c^3*d*f^3*g^5 - 24*a^3*b*c^2*d^2*f^3*g^5 - 4*
a^4*c*d^3*f^3*g^5 + 6*a^2*b^2*c^4*f^2*g^6 + 16*a^3*b*c^3*d*f^2*g^6 + 6*a^4*
c^2*d^2*f^2*g^6 - 4*a^3*b*c^4*f*g^7 - 4*a^4*c^3*d*f*g^7 + a^4*c^4*g^8) - 1/
4*B*log((b*x + a)/(d*x + c))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3
*g^2*x + f^4*g) - 1/8*(4*B*b^4*c*d^3*f^3 - 4*B*a*b^3*d^4*f^3 - 6*B*b^4*c^2*
d^2*f^2*g + 6*B*a^2*b^2*d^4*f^2*g + 4*B*b^4*c^3*d*f*g^2 - 4*B*a^3*b*d^4*f*g
^2 - B*b^4*c^4*g^3 + B*a^4*d^4*g^3)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))
/(b^4*d^4*f^8 - 4*b^4*c*d^3*f^7*g - 4*a*b^3*d^4*f^7*g + 6*b^4*c^2*d^2*f^6*g
^2 + 16*a*b^3*c*d^3*f^6*g^2 + 6*a^2*b^2*d^4*f^6*g^2 - 4*b^4*c^3*d*f^5*g^3 -
 24*a*b^3*c^2*d^2*f^5*g^3 - 24*a^2*b^2*c*d^3*f^5*g^3 - 4*a^3*b*d^4*f^5*g^3
+ b^4*c^4*f^4*g^4 + 16*a*b^3*c^3*d*f^4*g^4 + 36*a^2*b^2*c^2*d^2*f^4*g^4 + 1
6*a^3*b*c*d^3*f^4*g^4 + a^4*d^4*f^4*g^4 - 4*a*b^3*c^4*f^3*g^5 - 24*a^2*b^2*
c^3*d*f^3*g^5 - 24*a^3*b*c^2*d^2*f^3*g^5 - 4*a^4*c*d^3*f^3*g^5 + 6*a^2*b^2*
c^4*f^2*g^6 + 16*a^3*b*c^3*d*f^2*g^6 + 6*a^4*c^2*d^2*f^2*g^6 - 4*a^3*b*c^4*
f*g^7 - 4*a^4*c^3*d*f*g^7 + a^4*c^4*g^8) - 1/24*(18*B*b^3*c*d^2*f^2*g^4*x^3
 - 18*B*a*b^2*d^3*f^2*g^4*x^3 - 18*B*b^3*c^2*d*f*g^5*x^3 + 18*B*a^2*b*d^3*f
*g^5*x^3 + 6*B*b^3*c^3*g^6*x^3 - 6*B*a^3*d^3*g^6*x^3 + 60*B*b^3*c*d^2*f^3*g
^3*x^2 - 60*B*a*b^2*d^3*f^3*g^3*x^2 - 63*B*b^3*c^2*d*f^2*g^4*x^2 + 63*B*a^2
*b*d^3*f^2*g^4*x^2 + 21*B*b^3*c^3*f*g^5*x^2 + 9*B*a*b^2*c^2*d*f*g^5*x^2 - 9
*B*a^2*b*c*d^2*f*g^5*x^2 - 21*B*a^3*d^3*f*g^5*x^2 - 3*B*a*b^2*c^3*g^6*x^2 +
 3*B*a^3*c*d^2*g^6*x^2 + 68*B*b^3*c*d^2*f^4*g^2*x - 68*B*a*b^2*d^3*f^4*g^2*
x - 76*B*b^3*c^2*d*f^3*g^3*x + 76*B*a^2*b*d^3*f^3*g^3*x + 26*B*b^3*c^3*f^2*
g^4*x + 24*B*a*b^2*c^2*d*f^2*g^4*x - 24*B*a^2*b*c*d^2*f^2*g^4*x - 26*B*a^3*
d^3*f^2*g^4*x - 10*B*a*b^2*c^3*f*g^5*x + 10*B*a^3*c*d^2*f*g^5*x + 2*B*a^2*b
*c^3*g^6*x - 2*B*a^3*c^2*d*g^6*x + 6*A*b^3*d^3*f^6 + 6*B*b^3*d^3*f^6 - 18*A
```

*b^3*c*d^2*f^5*g + 8*B*b^3*c*d^2*f^5*g - 18*A*a*b^2*d^3*f^5*g - 44*B*a*b^2*d^3*f^5*g + 18*A*b^3*c^2*d*f^4*g^2 - 13*B*b^3*c^2*d*f^4*g^2 + 54*A*a*b^2*c*d^2*f^4*g^2 + 54*B*a*b^2*c*d^2*f^4*g^2 + 18*A*a^2*b*d^3*f^4*g^2 + 49*B*a^2*b*d^3*f^4*g^2 - 6*A*b^3*c^3*f^3*g^3 + 5*B*b^3*c^3*f^3*g^3 - 54*A*a*b^2*c^2*d*f^3*g^3 - 39*B*a*b^2*c^2*d*f^3*g^3 - 54*A*a^2*b*c*d^2*f^3*g^3 - 69*B*a^2*b*c*d^2*f^3*g^3 - 6*A*a^3*d^3*f^3*g^3 - 17*B*a^3*d^3*f^3*g^3 + 18*A*a*b^2*c^3*f^2*g^4 + 11*B*a*b^2*c^3*f^2*g^4 + 54*A*a^2*b*c^2*d*f^2*g^4 + 54*B*a^2*b*c^2*d*f^2*g^4 + 18*A*a^3*c*d^2*f^2*g^4 + 25*B*a^3*c*d^2*f^2*g^4 - 18*A*a^2*b*c^3*f*g^5 - 16*B*a^2*b*c^3*f*g^5 - 18*A*a^3*c^2*d*f*g^5 - 20*B*a^3*c^2*d*f*g^5 + 6*A*a^3*c^3*g^6 + 6*B*a^3*c^3*g^6)/(b^3*d^3*f^6*g^5*x^4 - 3*b^3*c*d^2*f^5*g^6*x^4 - 3*a*b^2*d^3*f^5*g^6*x^4 + 3*b^3*c^2*d*f^4*g^7*x^4 + 9*a*b^2*c*d^2*f^4*g^7*x^4 + 3*a^2*b*d^3*f^4*g^7*x^4 - b^3*c^3*f^3*g^8*x^4 - 9*a*b^2*c^2*d*f^3*g^8*x^4 - 9*a^2*b*c*d^2*f^3*g^8*x^4 - a^3*d^3*f^3*g^8*x^4 + 3*a*b^2*c^3*f^2*g^9*x^4 + 9*a^2*b*c^2*d*f^2*g^9*x^4 + 3*a^3*c*d^2*f^2*g^9*x^4 - 3*a^2*b*c^3*f*g^10*x^4 - 3*a^3*c^2*d*f*g^10*x^4 + a^3*c^3*g^11*x^4 + 4*b^3*d^3*f^7*g^4*x^3 - 12*b^3*c*d^2*f^6*g^5*x^3 - 12*a*b^2*d^3*f^6*g^5*x^3 + 12*b^3*c^2*d*f^5*g^6*x^3 + 36*a*b^2*c*d^2*f^5*g^6*x^3 + 12*a^2*b*d^3*f^5*g^6*x^3 - 4*b^3*c^3*f^4*g^7*x^3 - 36*a*b^2*c^2*d*f^4*g^7*x^3 - 36*a^2*b*c*d^2*f^4*g^7*x^3 - 4*a^3*d^3*f^4*g^7*x^3 + 12*a*b^2*c^3*f^3*g^8*x^3 + 36*a^2*b*c^2*d*f^3*g^8*x^3 + 12*a^3*c*d^2*f^3*g^8*x^3 - 12*a^2*b*c^3*f^2*g^9*x^3 - 12*a^3*c^2*d*f^2*g^9*x^3 + 4*a^3*c^3*f*g^10*x^3 + 6*b^3*d^3*f^8*g^3*x^2 - 18*b^3*c*d^2*f^7*g^4*x^2 - 18*a*b^2*d^3*f^7*g^4*x^2 + 18*b^3*c^2*d*f^6*g^5*x^2 + 54*a*b^2*c*d^2*f^6*g^5*x^2 + 18*a^2*b*d^3*f^6*g^5*x^2 - 6*b^3*c^3*f^5*g^6*x^2 - 54*a*b^2*c^2*d*f^5*g^6*x^2 - 54*a^2*b*c*d^2*f^5*g^6*x^2 - 6*a^3*d^3*f^5*g^6*x^2 + 18*a*b^2*c^3*f^4*g^7*x^2 + 54*a^2*b*c^2*d*f^4*g^7*x^2 + 18*a^3*c*d^2*f^4*g^7*x^2 - 18*a^2*b*c^3*f^3*g^8*x^2 - 18*a^3*c^2*d*f^3*g^8*x^2 + 6*a^3*c^3*f^2*g^9*x^2 + 4*b^3*d^3*f^9*g^2*x - 12*b^3*c*d^2*f^8*g^3*x - 12*a*b^2*d^3*f^8*g^3*x + 12*b^3*c^2*d*f^7*g^4*x + 36*a*b^2*c*d^2*f^7*g^4*x + 12*a^2*b*d^3*f^7*g^4*x - 4*b^3*c^3*f^6*g^5*x - 36*a*b^2*c^2*d*f^6*g^5*x - 36*a^2*b*c*d^2*f^6*g^5*x - 4*a^3*d^3*f^6*g^5*x + 12*a*b^2*c^3*f^5*g^6*x + 36*a^2*b*c^2*d*f^5*g^6*x + 12*a^3*c*d^2*f^5*g^6*x - 12*a^2*b*c^3*f^4*g^7*x - 12*a^3*c^2*d*f^4*g^7*x + 4*a^3*c^3*f^3*g^8*x + b^3*d^3*f^10*g - 3*b^3*c*d^2*f^9*g^2 - 3*a*b^2*d^3*f^9*g^2 + 3*b^3*c^2*d*f^8*g^3 + 9*a*b^2*c*d^2*f^8*g^3 + 3*a^2*b*d^3*f^8*g^3 - b^3*c^3*f^7*g^4 - 9*a*b^2*c^2*d*f^7*g^4 - 9*a^2*b*c*d^2*f^7*g^4 - a^3*d^3*f^7*g^4 + 3*a*b^2*c^3*f^6*g^5 + 9*a^2*b*c^2*d*f^6*g^5 + 3*a^3*c*d^2*f^6*g^5 - 3*a^2*b*c^3*f^5*g^6 - 3*a^3*c^2*d*f^5*g^6 + a^3*c^3*f^4*g^7) + 1/8*(2*B*b^5*c*d^4*f^4 - 2*B*a*b^4*d^5*f^4 - 4*B*b^5*c^2*d^3*f^3*g + 4*B*a^2*b^3*d^5*f^3*g + 6*B*b^5*c^3*d^2*f^2*g^2 - 6*B*a*b^4*c^2*d^3*f^2*g^2 + 6*B*a^2*b^3*c*d^4*f^2*g^2 - 6*B*a^3*b^2*d^5*f^2*g^2 - 4*B*b^5*c^4*d*f*g^3 + 4*B*a*b^4*c^3*d^2*f*g^3 - 4*B*a^3*b^2*c*d^4*f*g^3 + 4*B*a^4*b*d^5*f*g^3 + B*b^5*c^5*g^4 - B*a*b^4*c^4*d*g^4 + B*a^4*b*c*d^4*g^4 - B*a^5*d^5*g^4)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/((b^4*d^4*f^8*g - 4*b^4*c*d^3*f^7*g^2 - 4*a*b^3*d^4*f^7*g^2 + 6*b^4*c^2*d^2*f^6*g^3 + 16*a*b^3*c*d^3*f^6*g^3 + 6*a^2*b^2*d^4*f^6*g^3 - 4*b^4*c^3*d*f^5*g^4 - 24*a*b^3*c^2*d^2*f^5*g^4 - 24*a^2*b^2*c*d^

```
3*f^5*g^4 - 4*a^3*b*d^4*f^5*g^4 + b^4*c^4*f^4*g^5 + 16*a*b^3*c^3*d*f^4*g^5
+ 36*a^2*b^2*c^2*d^2*f^4*g^5 + 16*a^3*b*c*d^3*f^4*g^5 + a^4*d^4*f^4*g^5 - 4
*a*b^3*c^4*f^3*g^6 - 24*a^2*b^2*c^3*d*f^3*g^6 - 24*a^3*b*c^2*d^2*f^3*g^6 -
4*a^4*c*d^3*f^3*g^6 + 6*a^2*b^2*c^4*f^2*g^7 + 16*a^3*b*c^3*d*f^2*g^7 + 6*a^
4*c^2*d^2*f^2*g^7 - 4*a^3*b*c^4*f*g^8 - 4*a^4*c^3*d*f*g^8 + a^4*c^4*g^9)*ab
s(-b*c + a*d))
```

3.240 $\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=874

$$\frac{B^2g^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3\log(c+dx)(bc-ad)^4}{6b^4d^4}+\frac{B^2g^3x(bc-ad)^3}{6b^3d^3}+\frac{B^2g^2(4bdf-3bcg-adg)\log\left(\frac{a+bx}{c+dx}\right)(bc-a$$

[Out] (B^2*(b*c - a*d)^3*g^3*x)/(6*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*x)/(4*b^3*d^3) + (B^2*(b*c - a*d)^2*g^3*(c + d*x)^2)/(12*b^2*d^4) + (B^2*(b*c - a*d)^4*g^3*Log[(a + b*x)/(c + d*x)])/(6*b^4*d^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*Log[(a + b*x)/(c + d*x)])/(4*b^4*d^4) - (B*(b*c - a*d)*g*(a^2*d^2*g^2 - 2*a*b*d*g*(2*d*f - c*g) + b^2*(6*d^2*f^2 - 8*c*d*f*g + 3*c^2*g^2))*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^4*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*b^2*d^4) - (B*(b*c - a*d)*g^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*b*d^4) - (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*b^4*d^4) - ((b*f - a*g)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*g) + (B^2*(b*c - a*d)^4*g^3*Log[c + d*x])/(6*b^4*d^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*Log[c + d*x])/(4*b^4*d^4) + (B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - 2*a*b*d*g*(2*d*f - c*g) + b^2*(6*d^2*f^2 - 8*c*d*f*g + 3*c^2*g^2))*Log[c + d*x])/(2*b^4*d^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(2*b^4*d^4)

Rubi [A] time = 1.74393, antiderivative size = 994, normalized size of antiderivative = 1.14, number of steps used = 33, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2\log^2(a+bx)(bf-ag)^4}{4b^4g}-\frac{B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)(bf-ag)^4}{2b^4g}-\frac{B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)(bf-ag)^4}{2b^4g}-B^2$$

Antiderivative was successfully verified.

[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]

[Out] -(B^2*(b*c - a*d)^2*(b*c + a*d)*g^3*x)/(6*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - b*c*g - a*d*g)*x)/(4*b^3*d^3) - (A*B*(b*c - a*d)*g*(a^2*d^2*g^2

```
- a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*x)/(2*b^3
*d^3) + (B^2*(b*c - a*d)^2*g^3*x^2)/(12*b^2*d^2) - (a^3*B^2*(b*c - a*d)*g^3
*Log[a + b*x])/(6*b^4*d) + (a^2*B^2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*
g)*Log[a + b*x])/(4*b^4*d^2) + (B^2*(b*f - a*g)^4*Log[a + b*x]^2)/(4*b^4*g)
 - (B^2*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2
 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(2*b^4*d^3
) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(4*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3*(A + B*Log[(e*(a + b*x
))/(c + d*x)]))/(6*b*d) - (B*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[(e*(a +
b*x))/(c + d*x)]))/(2*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d
*x)])^2)/(4*g) + (B^2*c^3*(b*c - a*d)*g^3*Log[c + d*x])/(6*b*d^4) - (B^2*c^
2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(4*b^2*d^4) + (B^
2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*Log[c + d*x])/(2*b^4*d^4) - (B^2*(d*f - c*g)^4*Log[-((
d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*d^4*g) + (B*(d*f - c*g)^4*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(2*d^4*g) + (B^2*(d*f - c*g)^
4*Log[c + d*x]^2)/(4*d^4*g) - (B^2*(b*f - a*g)^4*Log[a + b*x]*Log[(b*(c + d
*x))/(b*c - a*d)])/(2*b^4*g) - (B^2*(b*f - a*g)^4*PolyLog[2, -((d*(a + b*x)
)/(b*c - a*d))])/(2*b^4*g) - (B^2*(d*f - c*g)^4*PolyLog[2, (b*(c + d*x))/(b
*c - a*d)])/(2*d^4*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
```

^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]

Rule 31

Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]

Rule 72

Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]

Rule 2524

Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_Symbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]

Rule 2418

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[RFx, x] && IntegerQ[p]

Rule 2390

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && EqQ[e*f - d*g, 0]

Rule 2301

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{B\int \frac{(bc-ad)(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int \left(\frac{g^2\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2\right.\right.}{b}\right.}{}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g} - \frac{\left(B(bc-ad)g^3\right)\int x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{2bd}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{2b^3d^3} -$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{2b^3d^3} -$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{2b^3d^3} -$$

$$= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3} - \frac{AB(bc-}{}$$

$$= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3} - \frac{AB(bc-}{}$$

$$= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3} - \frac{AB(bc-}{}$$

$$= -\frac{B^2(bc-ad)^2(bc+ad)g^3x}{6b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{4b^3d^3} - \frac{AB(bc-}{}$$

Mathematica [A] time = 0.972346, size = 733, normalized size = 0.84

$$(f+gx)^4\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B\left(3b^4B(df-cg)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-3Bd^4(bf-ag)^4\left(\log(a+bx)\left(\log(a+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(6*A*b*d*(b*c - a*
d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g +
 c^2*g^2))*x + 6*B*d*(b*c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g)
+ b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x))/(c + d
*x)] + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B*Log[(
e*(a + b*x))/(c + d*x)]) + 2*b^3*d^3*(b*c - a*d)*g^4*x^3*(A + B*Log[(e*(a +
 b*x))/(c + d*x)]) + 6*d^4*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[(e*(a + b*
x))/(c + d*x)]) - 6*B*(b*c - a*d)^2*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*
g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[c + d*x] - 6*b^4*(d*f - c*g
)^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + B*(b*c - a*d)*g^4*(
b*d*(b*c - a*d)*x*(2*b*c + 2*a*d - b*d*x) + 2*a^3*d^3*Log[a + b*x] - 2*b^3*
c^3*Log[c + d*x]) - 3*B*(b*c - a*d)*g^3*(-4*b*d*f + b*c*g + a*d*g)*(-(a^2*d
^2*Log[a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 3*B*d^4*(
b*f - a*g)^4*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]
) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 3*b^4*B*(d*f - c*g)^4*((2
*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])))/(3*b^4*d^4))/(4*g)
```

Maple [F] time = 2.677, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{3} \left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((g*x+f)^3*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.80513, size = 2889, normalized size = 3.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")

[Out] 1/4*A^2*g^3*x^4 + A^2*f*g^2*x^3 + 3/2*A^2*f^2*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*f^3 + 3*(x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*f^2*g + (2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*f*g^2 + 1/12*(6*x^4*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*g^3 + A^2*f^3*x - 1/12*(6*a^3*c*d^3*g^3 - 3*(8*c*d^3*f*g^2 - c^2*d^2*g^3)*a^2*b + 2*(18*c*d^3*f^2*g - 6*c^2*d^2*f*g^2 + c^3*d*g^3)*a*b^2 + (24*c*d^3*f^3*log(e) - (6*g^3*log(e) + 11*g^3)*c^4 + 12*(2*f*g^2*log(e) + 3*f*g^2)*c^3*d - 36*(f^2*g*log(e) + f^2*g)*c^2*d^2)*b^3)*B^2*log(d*x + c)/(b^3*d^4) + 1/2*(4*a*b^3*d^4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3 - (4*c*d^3*f^3 - 6*c^2*d^2*f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*b^4)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) + 1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 2*(a*b^3*d^4*g^3*log(e) + (6*d^4*f*g^2*log(e)^2 - c*d^3*g^3*log(e))*b^4)*B^2*x^3 - ((3*g^3*log(e) - g^3)*a^2*b^2*d^4 - 2*(6*d^4*f*g^2*log(e) - c*d^3*g^3)*a*b^3 - (18*d^4*f^2*g*log(e)^2 - 12*c*d^3*f*g^2*log(e) + (3*g^3*log(e) + g^3)*c^2*d^2)*b^4)*B^2*x^2 + ((6*g^3*log(e) - 5*g^3)*a^3*b*d^4 + (5*c*d^3*g^3 - 12*(2*f*g^2*log(e) - f*g^2)*d^4)*a^2*b^2 + (36*d^4*f^2*g*log(e) - 24*c*d^3*f*g^2 + 5*c^2*d^2*g^3)*a*b^3 + (12*d^4*f^3*log(e)^2 - 36*c*d^3*f^2*g*log(e) - (6*g^3*log(e) + 5*g^3)*c^3*d + 12*(2*f*g^2*log(e) + f*g^2)*c^2*d^2)*b^4)*B^2*x + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*a*b^3*d^4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3)*B^2)*log(b*x + a)^2 + 3*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*c*d^3*f^3 - 6*c^2*d^2*f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*B^2*b^4)*log(d*x + c)^2 + (6*B^2*b^4*d^4*g^3*x^4*log(e) + 2*(a*b^3*d^4*g^3 + (12*d^4*f*g^2*log(e) - c*d^3*g^3)*b^4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (12*d^4*f^2*g*log(e) - 4*c*d^3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4*a^2*b^2*d^4*f*g^2 + a^3*b*d^4*g^3 + (4*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^2*f*g^2 - c^3*d*g^3)*b^4)*B^2*x - ((6*g^3*log(e) - 11*g^3)*a^4*d^4 + 2*(c*d^3*g^3 - 6*(2*f*g^2*log(e) - 3*f*g^2)*d^4)*a^3*b - 3*(4*c*d^3*f*g^2 - c^2*d^2*g^3 - 12*(f^2*g*log(e) - f^2*g)*d^4)*a^2*b^2 - 6*(4*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^2*f*g^2 - c^3*d*g^3)*a*b^3)*B^2)*log(b*x + a) - (6*B^2*b^4*d^4*g^3*x^4*log(e) + 2*(a*b^3*d^4*g^3 + (12*d^4*f*g^2*log(e) - c*d^3*g^3)*b^4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (12*d^4*f^2*g*log(e) - 4*c*d^3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4*a^2*b^2*d^4*f*g^2 + a^3*b*d^4*g^3 + (4*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^2*f*g^2 - c^3*d*g^3)*b^4)*B^2*x + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3

```
 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*a*b^3*d^4*f^3 - 6*a^2
*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3)*B^2)*log(b*x + a))*log(d*
x + c))/(b^4*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(A\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*g^3
*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b*e*x + a*e)/(d*x +
c))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*log((b*
e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.241 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx$

Optimal. Leaf size=532

$$\frac{2B^2(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^3d^3}+\frac{2B(bc-ad)\left(a^2d^2g^2-abdg\right.}{}$$

```
[Out] (B^2*(b*c - a*d)^2*g^2*x)/(3*b^2*d^2) + (B^2*(b*c - a*d)^3*g^2*Log[(a + b*x
)/(c + d*x)])/(3*b^3*d^3) - (2*B*(b*c - a*d)*g*(3*b*d*f - 2*b*c*g - a*d*g)*
(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3*d^2) - (B*(b*c - a*d
)*g^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*d^3) + (2*B*(b
*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g
 + c^2*g^2))*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d
*x)]))/(3*b^3*d^3) - ((b*f - a*g)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)
/(3*b^3*g) + ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*g) + (
B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b^3*d^3) + (2*B^2*(b*c - a*d)^2*g*(3
*b*d*f - 2*b*c*g - a*d*g)*Log[c + d*x])/(3*b^3*d^3) + (2*B^2*(b*c - a*d)*(a
^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))
*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b^3*d^3)
```

Rubi [A] time = 1.09353, antiderivative size = 649, normalized size of antiderivative = 1.22, number of steps used = 29, number of rules used = 13, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.448, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{2B^2(bf-ag)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3g}-\frac{2B^2(df-cg)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3d^3g}+\frac{a^2B^2g^2(bc-ad)\log(a+bx)}{3b^3d}-\frac{2ABgx(bc}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] (B^2*(b*c - a*d)^2*g^2*x)/(3*b^2*d^2) - (2*A*B*(b*c - a*d)*g*(3*b*d*f - b*c
*g - a*d*g)*x)/(3*b^2*d^2) + (a^2*B^2*(b*c - a*d)*g^2*Log[a + b*x])/(3*b^3*
d) + (B^2*(b*f - a*g)^3*Log[a + b*x]^2)/(3*b^3*g) - (2*B^2*(b*c - a*d)*g*(3
*b*d*f - b*c*g - a*d*g)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(3*b^3*d^2)
 - (B*(b*c - a*d)*g^2*x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b*d) - (
2*B*(b*f - a*g)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*b^3
*g) + ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(3*g) - (B^2*c^2
*(b*c - a*d)*g^2*Log[c + d*x])/(3*b*d^3) + (2*B^2*(b*c - a*d)^2*g*(3*b*d*f
```

```
- b*c*g - a*d*g)*Log[c + d*x])/(3*b^3*d^3) - (2*B^2*(d*f - c*g)^3*Log[-((d*
(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^3*g) + (2*B*(d*f - c*g)^3*(A +
B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*d^3*g) + (B^2*(d*f - c*g)^
3*Log[c + d*x]^2)/(3*d^3*g) - (2*B^2*(b*f - a*g)^3*Log[a + b*x]*Log[(b*(c +
 d*x))/(b*c - a*d)])/(3*b^3*g) - (2*B^2*(b*f - a*g)^3*PolyLog[2, -((d*(a +
b*x))/(b*c - a*d))])/(3*b^3*g) - (2*B^2*(d*f - c*g)^3*PolyLog[2, (b*(c + d*
x))/(b*c - a*d)])/(3*d^3*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{(2B)\int \frac{(bc-ad)(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{(2B(bc-ad))\int \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{(2B(bc-ad))\int \left(\frac{g^2(3bdf-bcg-adg)\left(A+B\log\left(\frac{e(a\text{-}}{c\text{+}}\right.\right.}{b^2d^2}\right.}{}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g} - \frac{\left(2B(bc-ad)g^2\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{B(bc-ad)g^2x^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3bd}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-bcg-adg)(a+}{3b^3d^2}$$

$$= -\frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{2B^2(bc-ad)g(3bdf-bcg-adg)(a+}{3b^3d^2}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-ad)g^2\log}{3b^3d}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-ad)g^2\log}{3b^3d}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-ad)g^2\log}{3b^3d}$$

$$= \frac{B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{2AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{a^2B^2(bc-ad)g^2\log}{3b^3d}$$

Mathematica [A] time = 0.530899, size = 486, normalized size = 0.91

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B\left(b^3B(df-cg)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-Bd^3(bf-ag)^3\left(\log(a+bx)\left(\log(a+bx)\right.\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(2*A*b*d*(b*c - a*
d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + 2*B*d*(b*c - a*d)*g^2*(3*b*d*f - b*c*g
 - a*d*g)*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + b^2*d^2*(b*c - a*d)*g^3*
x^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d^3*(b*f - a*g)^3*Log[a + b*x]
*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*B*(b*c - a*d)^2*g^2*(-3*b*d*f + b
*c*g + a*d*g)*Log[c + d*x] - 2*b^3*(d*f - c*g)^3*(A + B*Log[(e*(a + b*x))/(
c + d*x)])*Log[c + d*x] - B*(b*c - a*d)*g^3*(a^2*d^2*Log[a + b*x] - b*(d*(-
(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - B*d^3*(b*f - a*g)^3*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + b^3*B*(d*f - c*g)^3*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)))/(b^3*d^3))/(3*g)
```

Maple [F] time = 2.257, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{2} \left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((g*x+f)^2*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.69195, size = 1755, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/3*A^2*g^2*x^3 + A^2*f*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) +
 a*log(b*x + a)/b - c*log(d*x + c)/d)*A*B*f^2 + 2*(x^2*log(b*e*x/(d*x + c)
+ a*e/(d*x + c)) - a^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d
```

```
)*x/(b*d))*A*B*f*g + 1/3*(2*x^3*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + 2*a^
3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*
(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*g^2 + A^2*f^2*x + 1/3*(2*a^2*c*d^2*g^
2 - (6*c*d^2*f*g - c^2*d*g^2)*a*b - (6*c*d^2*f^2*log(e) + (2*g^2*log(e) + 3
*g^2)*c^3 - 6*(f*g*log(e) + f*g)*c^2*d)*b^2)*B^2*log(d*x + c)/(b^2*d^3) + 2
/3*(3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2 - (3*c*d^2*f^2 - 3*c^2*
d*f*g + c^3*g^2)*b^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + di
log(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/3*(B^2*b^3*d^3*g^2*x^3*l
og(e)^2 + (a*b^2*d^3*g^2*log(e) + (3*d^3*f*g*log(e)^2 - c*d^2*g^2*log(e))*b
^3)*B^2*x^2 - ((2*g^2*log(e) - g^2)*a^2*b*d^3 - 2*(3*d^3*f*g*log(e) - c*d^2
*g^2)*a*b^2 - (3*d^3*f^2*log(e)^2 - 6*c*d^2*f*g*log(e) + (2*g^2*log(e) + g^
2)*c^2*d)*b^3)*B^2*x + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2
*b^3*d^3*f^2*x + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2)*B^2)*log
(b*x + a)^2 + (B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2*b^3*d^3*
f^2*x + (3*c*d^2*f^2 - 3*c^2*d*f*g + c^3*g^2)*B^2*b^3)*log(d*x + c)^2 + (2*
B^2*b^3*d^3*g^2*x^3*log(e) + (a*b^2*d^3*g^2 + (6*d^3*f*g*log(e) - c*d^2*g^2
)*b^3)*B^2*x^2 + 2*(3*a*b^2*d^3*f*g - a^2*b*d^3*g^2 + (3*d^3*f^2*log(e) - 3
*c*d^2*f*g + c^2*d*g^2)*b^3)*B^2*x + ((2*g^2*log(e) - 3*g^2)*a^3*d^3 + (c*d
^2*g^2 - 6*(f*g*log(e) - f*g)*d^3)*a^2*b + 2*(3*d^3*f^2*log(e) - 3*c*d^2*f*
g + c^2*d*g^2)*a*b^2)*B^2)*log(b*x + a) - (2*B^2*b^3*d^3*g^2*x^3*log(e) + (
a*b^2*d^3*g^2 + (6*d^3*f*g*log(e) - c*d^2*g^2)*b^3)*B^2*x^2 + 2*(3*a*b^2*d^
3*f*g - a^2*b*d^3*g^2 + (3*d^3*f^2*log(e) - 3*c*d^2*f*g + c^2*d*g^2)*b^3)*B
^2*x + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x
 + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2)*B^2)*log(b*x + a))*log
(d*x + c))/(b^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2g^2x^2 + 2\,A^2fgx + A^2f^2 + \left(B^2g^2x^2 + 2\,B^2fgx + B^2f^2\right)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2\left(ABg^2x^2 + 2\,ABfgx + ABf^2\right)\text{lo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*x +
 B^2*f^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x + A
*B*f^2)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)^2 \left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.242 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=270

$$\frac{B^2(bc-ad)(-adg-bcg+2bdf)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2d^2}+\frac{B(bc-ad)(-adg-bcg+2bdf)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2d^2}$$

```
[Out] -((B*(b*c - a*d)*g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*d))
 + (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[(b*c - a*d)/(b*(c + d*x))]*
(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*d^2) - ((b*f - a*g)^2*(A + B*Log
[(e*(a + b*x))/(c + d*x)])^2)/(2*b^2*g) + ((f + g*x)^2*(A + B*Log[(e*(a + b
*x))/(c + d*x)])^2)/(2*g) + (B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b^2*d^2) +
(B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLog[2, (d*(a + b*x))/(b*(c +
 d*x))])/(b^2*d^2)
```

Rubi [A] time = 0.820035, antiderivative size = 444, normalized size of antiderivative = 1.64, number of steps used = 25, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{B^2(bf-ag)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}-\frac{B^2(df-cg)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2g}-\frac{B(bf-ag)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*g*x)/(b*d)) + (B^2*(b*f - a*g)^2*Log[a + b*x]^2)/(2*b^2*
g) - (B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)])/(b^2*d) - (
B*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(b^2*g)
+ ((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(2*g) + (B^2*(b*c -
a*d)^2*g*Log[c + d*x])/(b^2*d^2) - (B^2*(d*f - c*g)^2*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x])/(d^2*g) + (B*(d*f - c*g)^2*(A + B*Log[(e*(a + b*
x))/(c + d*x)])*Log[c + d*x])/(d^2*g) + (B^2*(d*f - c*g)^2*Log[c + d*x]^2)/
(2*d^2*g) - (B^2*(b*f - a*g)^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])
/(b^2*g) - (B^2*(b*f - a*g)^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(b^
2*g) - (B^2*(d*f - c*g)^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(d^2*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{B\int \frac{(bc-ad)(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{(B(bc-ad))\int \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}dx}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{(B(bc-ad))\int\left(\frac{g^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{bd} + \frac{(bf-ag \cdots}{\cdots}\right.}{\cdots}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g} - \frac{(B(bc-ad)g)\int\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)dx}{bd} \cdots$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B(bf-ag)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b^2g} + \frac{(f+gx) \cdots}{\cdots}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)^2\log(a+ \cdots}{\cdots}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)^2\log(a+ \cdots}{\cdots}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)^2\log(a+ \cdots}{\cdots}$$

$$= -\frac{AB(bc-ad)gx}{bd} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)}{c+dx}\right)}{b^2d} - \frac{B(bf-ag)^2\log(a+ \cdots}{\cdots}$$

$$= -\frac{AB(bc-ad)gx}{bd} + \frac{B^2(bf-ag)^2\log^2(a+bx)}{2b^2g} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(\cdots}{c \cdots}\right.}{b^2d}$$

$$= -\frac{AB(bc-ad)gx}{bd} + \frac{B^2(bf-ag)^2\log^2(a+bx)}{2b^2g} - \frac{B^2(bc-ad)g(a+bx)\log\left(\frac{e(\cdots}{c \cdots}\right.}{b^2d}$$

Mathematica [A] time = 0.314106, size = 346, normalized size = 1.28

$$(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2 - \frac{B\left(b^2B(df-cg)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-Bd^2(bf-ag)^2\left(\log(a+bx)\left(\log(a+b \cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] ((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 - (B*(2*A*b*d*(b*c - a*
d)*g^2*x + 2*B*d*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x))/(c + d*x)] + 2
*d^2*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*B*
(b*c - a*d)^2*g^2*Log[c + d*x] - 2*b^2*(d*f - c*g)^2*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x] - B*d^2*(b*f - a*g)^2*(Log[a + b*x]*(Log[a + b*
x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c)
 + a*d)]) + b^2*B*(d*f - c*g)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(b^2*d
^2))/(2*g)
```

Maple [F] time = 1.851, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [B] time = 1.58545, size = 909, normalized size = 3.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*g*x^2 + 2*(x*log(b*e*x/(d*x + c) + a*e/(d*x + c)) + a*log(b*x + a)/
b - c*log(d*x + c)/d)*A*B*f + (x^2*log(b*e*x/(d*x + c) + a*e/(d*x + c)) - a
^2*log(b*x + a)/b^2 + c^2*log(d*x + c)/d^2 - (b*c - a*d)*x/(b*d))*A*B*g + A
^2*f*x - (a*c*d*g + (2*c*d*f*log(e) - (g*log(e) + g)*c^2)*b)*B^2*log(d*x +
c)/(b*d^2) + (2*a*b*d^2*f - a^2*d^2*g - (2*c*d*f - c^2*g)*b^2)*(log(b*x + a
)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B
```

```
^2/(b^2*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(a*b*d^2*g*log(e) + (d^2
*f*log(e)^2 - c*d*g*log(e))*b^2)*B^2*x + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2
*f*x + (2*a*b*d^2*f - a^2*d^2*g)*B^2)*log(b*x + a)^2 + (B^2*b^2*d^2*g*x^2 +
 2*B^2*b^2*d^2*f*x + (2*c*d*f - c^2*g)*B^2*b^2)*log(d*x + c)^2 + 2*(B^2*b^2
*d^2*g*x^2*log(e) + (a*b*d^2*g + (2*d^2*f*log(e) - c*d*g)*b^2)*B^2*x - ((g*
log(e) - g)*a^2*d^2 - (2*d^2*f*log(e) - c*d*g)*a*b)*B^2)*log(b*x + a) - 2*(
B^2*b^2*d^2*g*x^2*log(e) + (a*b*d^2*g + (2*d^2*f*log(e) - c*d*g)*b^2)*B^2*x
 + (B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x + (2*a*b*d^2*f - a^2*d^2*g)*B^2)*
log(b*x + a))*log(d*x + c))/(b^2*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(\frac{bex + ae}{dx + c}\right)^2 + 2\left(ABgx + ABf\right)\log\left(\frac{bex + ae}{dx + c}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b*e*x + a*e)/(d*x + c))^2
 + 2*(A*B*g*x + A*B*f)*log((b*e*x + a*e)/(d*x + c)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(gx + f\right)\left(B\log\left(\frac{(bx + a)e}{dx + c}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.243 $\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\,dx$

Optimal. Leaf size=125

$$\frac{2B^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{2B(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{b}$$

```
[Out] (2*B*(b*c - a*d)*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c
 + d*x)]))/(b*d) + ((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/b + (
2*B^2*(b*c - a*d)*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d)
```

Rubi [A] time = 0.637131, antiderivative size = 246, normalized size of antiderivative = 1.97, number of steps used = 22, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2523, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2aB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b}+\frac{2B^2c\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d}+\frac{2aB\log(a+bx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{b}-\frac{2Bc\log(c+dx)\left(B\,l\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] -((a*B^2*Log[a + b*x]^2)/b) + (2*a*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/b + x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (2*B^2*c*Log[-(
(d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (2*B*c*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[c + d*x])/d - (B^2*c*Log[c + d*x]^2)/d + (2*a*B^2*Log[a
+ b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (2*a*B^2*PolyLog[2, -((d*(a + b*
x))/(b*c - a*d))])/b + (2*B^2*c*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/d
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 dx = x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - (2B)\int \frac{(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}\,dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - (2B(bc-ad))\int \frac{x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)}\,dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - (2B(bc-ad))\int \left(-\frac{a\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(a+bx)} + \frac{c\left(A+B\log\right.}{(bc-ad)}\right.$$

$$= x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 + (2aB)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx - (2Bc)\int \frac{A+B\log\left(\frac{e(a}{c}\right.}{c+dx}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\left(A+B\log\right.}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\left(A+B\log\right.}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\left(A+B\log\right.}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 - \frac{2Bc\left(A+B\log\right.}{}$$

$$= \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 + \frac{2B^2c\log\left(-\frac{d(a+b}{bc-a}\right.}{d}$$

$$= -\frac{aB^2\log^2(a+bx)}{b} + \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.$$

$$= -\frac{aB^2\log^2(a+bx)}{b} + \frac{2aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right.$$

Mathematica [A] time = 0.164023, size = 214, normalized size = 1.71

$$\frac{B\left(-aBd\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBc\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\right.}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] x*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(2*a*d*Log[a + b*x]*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]) - 2*b*c*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Lo
g[c + d*x] - a*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c -
 a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*c*((2*Log[(d*(a
 + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])))/(b*d)
```

Maple [F] time = 1.722, size = 0, normalized size = 0.

$$\int \left(A + B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\left(x\log\left(\frac{(bx+a)e}{dx+c}\right)+\frac{\frac{ae\log(bx+a)}{b}-\frac{ce\log(dx+c)}{d}}{e}\right)AB+A^2x+B^2\left(\frac{bdx\log(bx+a)^2+(bdx+bc)\log(dx+c)^2-2\,(bdx\log}{bd}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] 2*(x*log((b*x + a)*e/(d*x + c)) + (a*e*log(b*x + a)/b - c*e*log(d*x + c)/d)
/e)*A*B + A^2*x + B^2*((b*d*x*log(b*x + a)^2 + (b*d*x + b*c)*log(d*x + c)^2
 - 2*(b*d*x*log(e) + (b*d*x + a*d)*log(b*x + a))*log(d*x + c))/(b*d) + inte
grate(((log(e)^2 + 2*log(e))*b^2*d*x^2 + a*b*c*log(e)^2 + (b^2*c*log(e)^2 +
 (log(e)^2 + 2*log(e))*a*b*d)*x + 2*(b^2*d*x^2*log(e) + a*b*c*log(e) + a^2*
d + (a*b*d*(log(e) + 2) + b^2*c*(log(e) - 1))*x)*log(b*x + a))/(b^2*d*x^2 +
 a*b*c + (b^2*c + a*b*d)*x), x))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
+ c)) + A^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.244 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{f+gx}\,dx$

Optimal. Leaf size=277

$$\frac{2B\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}-\frac{2B\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{g}-\frac{2B^2\text{PolyLog}\left(3,\frac{(\cdot}{(\cdot}\right.}{g}$$

```
[Out] -((Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/g
) + ((A + B*Log[(e*(a + b*x))/(c + d*x)])^2*Log[1 - ((d*f - c*g)*(a + b*x))
/((b*f - a*g)*(c + d*x))])/g - (2*B*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Po
lyLog[2, (d*(a + b*x))/(b*(c + d*x))])/g + (2*B*(A + B*Log[(e*(a + b*x))/(c
 + d*x)])*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/g +
(2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/g - (2*B^2*PolyLog[3, ((d*f
 - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/g
```

Rubi [B] time = 4.90048, antiderivative size = 1998, normalized size of antiderivative = 7.21, number of steps used = 41, number of rules used = 21, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.724, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2437, 2435, 2315}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x),x]
```

```
[Out] -((B^2*Log[a + b*x]^2*Log[f + g*x])/g) - (2*A*B*Log[-((g*(a + b*x))/(b*f -
a*g))]*Log[f + g*x])/g - (B^2*Log[(c + d*x)^(-1)]^2*Log[f + g*x])/g + (2*B^
2*Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[a + b*x] + Log[(c + d*x)^(-1)] - L
og[(e*(a + b*x))/(c + d*x)])*Log[f + g*x])/g + ((A + B*Log[(e*(a + b*x))/(c
 + d*x)])^2*Log[f + g*x])/g + (2*B^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[
c + d*x]*Log[f + g*x])/g - (2*B^2*Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[(c
 + d*x)^(-1)] + Log[c + d*x])*Log[f + g*x])/g + (2*B^2*Log[a + b*x]*Log[(b*
(c + d*x))/(b*c - a*d)]*Log[f + g*x])/g + (2*A*B*Log[-((g*(c + d*x))/(d*f -
 c*g))]*Log[f + g*x])/g - (2*B^2*(Log[a + b*x] + Log[(c + d*x)^(-1)] - Log[
(e*(a + b*x))/(c + d*x)])*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g
 + (B^2*Log[a + b*x]^2*Log[(b*(f + g*x))/(b*f - a*g)])/g + (B^2*Log[(c + d*
x)^(-1)]^2*Log[(d*(f + g*x))/(d*f - c*g)])/g + (B^2*(Log[(b*(c + d*x))/(b*c
 - a*d)] + Log[(b*f - a*g)/(b*(f + g*x))] - Log[((b*f - a*g)*(c + d*x))/((b
```

```
*c - a*d)*(f + g*x))])*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)
))]^2)/g - (B^2*(Log[(b*(c + d*x))/(b*c - a*d)] - Log[-((g*(c + d*x))/(d*f
- c*g))])*(Log[a + b*x] + Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b
*x)))])^2)/g + (B^2*(Log[-((d*(a + b*x))/(b*c - a*d))] + Log[(d*f - c*g)/(d
*(f + g*x))] - Log[-(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])*Log
[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]^2)/g - (B^2*(Log[-((d*(a
+ b*x))/(b*c - a*d))] - Log[-((g*(a + b*x))/(b*f - a*g))])*(Log[c + d*x] +
Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])^2)/g + (2*B^2*(Log[f
+ g*x] - Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2
, -((d*(a + b*x))/(b*c - a*d))])/g + (2*B^2*Log[a + b*x]*PolyLog[2, -((g*(a
 + b*x))/(b*f - a*g))])/g + (2*B^2*(Log[f + g*x] - Log[((b*c - a*d)*(f + g*
x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/g - (2
*B^2*Log[(c + d*x)^(-1)]*PolyLog[2, -((g*(c + d*x))/(d*f - c*g))])/g - (2*B
^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]*PolyLog[2, (g*(a
 + b*x))/(b*(f + g*x))])/g + (2*B^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c
*g)*(a + b*x)))]*PolyLog[2, -(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x
)))])/g - (2*B^2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]*PolyL
og[2, (g*(c + d*x))/(d*(f + g*x))])/g + (2*B^2*Log[((b*c - a*d)*(f + g*x))/
((b*f - a*g)*(c + d*x))]*PolyLog[2, ((b*f - a*g)*(c + d*x))/((b*c - a*d)*(f
 + g*x))])/g - (2*A*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2*B^2*(Lo
g[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
 (b*(f + g*x))/(b*f - a*g)])/g - (2*B^2*(Log[(c + d*x)^(-1)] + Log[c + d*x]
)*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2*B^2*(Log[c + d*x] + Log[((b
*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(f + g*x))/(b*
f - a*g)])/g + (2*A*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (2*B^2*(Lo
g[a + b*x] + Log[(c + d*x)^(-1)] - Log[(e*(a + b*x))/(c + d*x)])*PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)])/g + (2*B^2*(Log[a + b*x] + Log[-(((b*c - a*d)*
(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)]
)/g - (2*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/g - (2*B^2*PolyLog[3
, -((g*(a + b*x))/(b*f - a*g))])/g - (2*B^2*PolyLog[3, (b*(c + d*x))/(b*c -
 a*d)])/g - (2*B^2*PolyLog[3, -((g*(c + d*x))/(d*f - c*g))])/g - (2*B^2*Pol
yLog[3, (g*(a + b*x))/(b*(f + g*x))])/g + (2*B^2*PolyLog[3, -(((d*f - c*g)*
(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (2*B^2*PolyLog[3, (g*(c + d*x))/(
d*(f + g*x))])/g + (2*B^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/((b*c - a*d)*(
f + g*x))])/g - (2*B^2*PolyLog[3, (b*(f + g*x))/(b*f - a*g)])/g - (2*B^2*Po
lyLog[3, (d*(f + g*x))/(d*f - c*g)])/g
```

<u>Rule 2524</u>

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
```

```
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2437

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*Log[(h_.)*((i_.) + (j_.)*(x_))^(m
_.)])/(x_), x_Symbol] :> Dist[m, Int[(Log[i + j*x]*Log[c*(d + e*x)^n])/x, x
], x] - Dist[m*Log[i + j*x] - Log[h*(i + j*x)^m], Int[Log[c*(d + e*x)^n]/x,
 x], x] /; FreeQ[{c, d, e, h, i, j, m, n}, x] && NeQ[e*i - d*j, 0] && NeQ[i
 + j*x, h*(i + j*x)^m]
```

Rule 2435

```
Int[(Log[(a_) + (b_.)*(x_)]*Log[(c_) + (d_.)*(x_)])/(x_), x_Symbol] :> Simp
[Log[-((b*x)/a)]*Log[a + b*x]*Log[c + d*x], x] + (Simp[(1*(Log[-((b*x)/a)]
- Log[-(((b*c - a*d)*x)/(a*(c + d*x)))] + Log[(b*c - a*d)/(b*(c + d*x))])*L
og[(a*(c + d*x))/(c*(a + b*x))]^2)/2, x] - Simp[(1*(Log[-((b*x)/a)] - Log[-
((d*x)/c)])*(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])^2)/2, x] + Si
mp[(Log[c + d*x] - Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1 + (b*x)/a
], x] + Simp[(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1
 + (d*x)/c], x] + Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2, (c*(a +
b*x))/(a*(c + d*x))], x] - Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2,
```

```
 (d*(a + b*x))/(b*(c + d*x))], x] - Simp[PolyLog[3, 1 + (b*x)/a], x] - Simp
[PolyLog[3, 1 + (d*x)/c], x] + Simp[PolyLog[3, (c*(a + b*x))/(a*(c + d*x))]
, x] - Simp[PolyLog[3, (d*(a + b*x))/(b*(c + d*x))], x]) /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{f+gx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{e(a+bx)}\,d}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)\left(-\frac{de(a+bx)}{(c+dx)^2}+\frac{be}{c+dx}\right)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{a+bx}\,d}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{(bc-ad)(a+bx)} - \frac{d\left(A+B\,l\right.}{}\right.}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2bB)\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(f+gx)}{a+bx}\,dx}{g} + \frac{(2Bd)\int \frac{\left(A+\right.}{}}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2bB)\int \left(\frac{A\log(f+gx)}{a+bx} + \frac{B\log\left(\frac{e(a+bx)}{c+dx}\right)\log(f+gx)}{a+bx}\right)dx}{g} + \frac{(2}{}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} - \frac{(2AbB)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} - \frac{\left(2bB^2\right)\int \frac{\log\left(\frac{e(a+bx)}{c+dx}\right)\log(f+g}{a+bx}}{g}$$

$$= -\frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2\log(f+gx)}{g} + \frac{2AB\log\left(-\frac{g(c}{df}\right.}{}$$

$$= -\frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{2B^2\log\left(-\frac{g(a+bx)}{bf-ag}\right)\left(\log(a+bx)+\log\left(\frac{1}{c+dx}\right)-\log\left(\right.\right.}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)\log(f}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)\log(f}{g}$$

$$= -\frac{B^2\log^2(a+bx)\log(f+gx)}{g} - \frac{2AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{c+dx}\right)\log(f}{g}$$

$$\ldots\ \frac{2AB\log\left(-\frac{g(a+bx)}{}\right)\log(f+gx)}{} \quad \frac{B^2\log^2\left(\frac{1}{}\right)\log(f}{}$$

Mathematica [A] time = 0.857124, size = 431, normalized size = 1.56

$$2AB\text{PolyLog}\left(2,\frac{g(a+bx)}{ag-bf}\right)+2B^2\log\left(\frac{e(a+bx)}{c+dx}\right)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)-2B^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\log\left(\frac{e(a+bx)}{c+dx}\right)-2B^2\text{Poly}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x),x]
```

```
[Out] (-(B^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[(b*c - a*d)/(b*c + b*d*x)]) + A^2
*Log[f + g*x] - 2*A*B*Log[a/b + x]*Log[f + g*x] + 2*A*B*Log[c/d + x]*Log[f
+ g*x] + 2*A*B*Log[(e*(a + b*x))/(c + d*x)]*Log[f + g*x] + 2*A*B*Log[a/b +
x]*Log[(b*(f + g*x))/(b*f - a*g)] - 2*A*B*Log[c/d + x]*Log[(d*(f + g*x))/(d
*f - c*g)] + B^2*Log[(e*(a + b*x))/(c + d*x)]^2*Log[((b*c - a*d)*(f + g*x))
/((b*f - a*g)*(c + d*x))] + 2*A*B*PolyLog[2, (g*(a + b*x))/(-(b*f) + a*g)]
- 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))
] + 2*B^2*Log[(e*(a + b*x))/(c + d*x)]*PolyLog[2, ((d*f - c*g)*(a + b*x))/(
(b*f - a*g)*(c + d*x))] - 2*A*B*PolyLog[2, (g*(c + d*x))/(-(d*f) + c*g)] +
2*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))] - 2*B^2*PolyLog[3, ((d*f - c*
g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/g
```

Maple [B] time = 0.336, size = 2428, normalized size = 8.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x)
```

```
[Out] -2*B^2/g/(a*d-b*c)*polylog(3,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c-A^2
/g/(a*d-b*c)*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*c*g-d*f*(b*e/d+(a*d-b*c)*e/d/
(d*x+c))-a*e*g+b*e*f)*b*c+A^2/g/(a*d-b*c)*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)
)-b*e)*b*c+2*B^2/g/(a*d-b*c)*polylog(3,-(c*g-d*f)/(-a*e*g+b*e*f)*(b*e/d+(a*
d-b*c)*e/d/(d*x+c)))*b*c-d*A^2/g/(a*d-b*c)*ln(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))-b*e)*a-2*d*B^2/g/(a*d-b*c)*polylog(3,-(c*g-d*f)/(-a*e*g+b*e*f)*(b*e/d+(a
*d-b*c)*e/d/(d*x+c)))*a+2*d*B^2/g/(a*d-b*c)*polylog(3,1/b/e*d*(b*e/d+(a*d-b
*c)*e/d/(d*x+c)))*a+d*A^2/g/(a*d-b*c)*ln((b*e/d+(a*d-b*c)*e/d/(d*x+c))*c*g-
d*f*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)*a-2*A*B/(a*d-b*c)*ln(b*e/d+(
a*d-b*c)*e/d/(d*x+c))*ln(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e
*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c^2*b+2*A*B/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/
d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*b*c-2*d*A*B/g/(a*
```

```
d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))
-b*e)/b/e)*a+2*d*A*B/(a*d-b*c)*dilog(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c
))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c*a-B^2/g/(a*d-b*c)*ln(b*e/d+(a*d
-b*c)*e/d/(d*x+c))^2*ln(1+(c*g-d*f)/(-a*e*g+b*e*f)*(b*e/d+(a*d-b*c)*e/d/(d*
x+c)))*b*c-2*B^2/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*polylog(2,-(c*
g-d*f)/(-a*e*g+b*e*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c-2*d*A*B/g/(a*d-b*c
)*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/b/e)*a-2*A*B/(a*d-b*c)*dilog
(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g
-d*f)*c^2*b+2*A*B/g/(a*d-b*c)*dilog(-(d*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-b*e)/
b/e)*b*c+2*d*B^2/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*polylog(2,-(c*
g-d*f)/(-a*e*g+b*e*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a-d*B^2/g/(a*d-b*c)*ln
(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))
*a-2*d*B^2/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*polylog(2,1/b/e*d*(b
*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+d*B^2/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*
x+c))^2*ln(1+(c*g-d*f)/(-a*e*g+b*e*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*a+B^2/
g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))^2*ln(1-1/b/e*d*(b*e/d+(a*d-b*c)
*e/d/(d*x+c)))*b*c+2*B^2/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*polylo
g(2,1/b/e*d*(b*e/d+(a*d-b*c)*e/d/(d*x+c)))*b*c-2*d^2*A*B/g/(a*d-b*c)*dilog(
((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-
d*f)*f*a+2*d*A*B/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(((c*g-d*f)*(b
*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*c*a+2*d*
A*B/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c))*ln(((c*g-d*f)*(b*e/d+(a*d-b
*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))/(c*g-d*f)*f*b*c+2*d*A*B/g/(a*
d-b*c)*dilog(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+
b*e*f))/(c*g-d*f)*f*b*c-2*d^2*A*B/g/(a*d-b*c)*ln(b*e/d+(a*d-b*c)*e/d/(d*x+c
))*ln(((c*g-d*f)*(b*e/d+(a*d-b*c)*e/d/(d*x+c))-a*e*g+b*e*f)/(-a*e*g+b*e*f))
/(c*g-d*f)*f*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{A^2 \log\left(gx+f\right)}{g} - \int -\frac{B^2 \log\left(bx+a\right)^2 + B^2\log\left(e\right)^2 + 2\,AB\log\left(e\right) + 2\left(B^2\log\left(e\right)+AB\right)\log\left(bx+a\right) - 2\left(B^2\log\left(bx+\right.\right.}{gx+f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x, algorithm="maxima")
```

```
[Out] A^2*log(g*x + f)/g - integrate(-(B^2*log(b*x + a)^2 + B^2*log(e)^2 + 2*A*B*
log(e) + 2*(B^2*log(e) + A*B)*log(b*x + a) - 2*(B^2*log(b*x + a) + B^2*log(
e) + A*B)*log(d*x + c))/(g*x + f), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(g*x + f), x)
```

3.245 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^2}\,dx$

Optimal. Leaf size=196

$$\frac{2B^2(bc-ad)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{(bf-ag)(df-cg)}+\frac{2B(bc-ad)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)}{(bf-ag)(df-cg)}+\frac{(a+bx)\left(B\log\left(\frac{e(a+}{c+}\right.\right.}{(f+gx)(bf-}$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/((b*f - a*g)*(f + g*x))
+ (2*B*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - ((d*f - c*g
)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(
b*c - a*d)*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b
*f - a*g)*(d*f - c*g))
```

Rubi [B] time = 1.1194, antiderivative size = 612, normalized size of antiderivative = 3.12, number of steps used = 32, number of rules used = 10, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.345, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{2bB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g(bf-ag)}+\frac{2B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g(df-cg)}-\frac{2B^2(bc-ad)\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{(bf-ag)(df-cg)}+\frac{2B^2(bc-ad)\text{PolyLog}\left(\right.}{(bf-ag)(df-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^2,x]
```

```
[Out] -((b*B^2*Log[a + b*x]^2)/(g*(b*f - a*g))) + (2*b*B*Log[a + b*x]*(A + B*Log[
(e*(a + b*x))/(c + d*x)]))/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x))/(c +
d*x)])^2/(g*(f + g*x)) + (2*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
 d*x])/(g*(d*f - c*g)) - (2*B*d*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c
+ d*x])/(g*(d*f - c*g)) - (B^2*d*Log[c + d*x]^2)/(g*(d*f - c*g)) + (2*b*B^2
*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g)) - (2*B^2*(b*c
 - a*d)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)*(d*f -
 c*g)) + (2*B*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x]
)/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(b*c - a*d)*Log[-((g*(c + d*x))/(d*f -
 c*g))]*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (2*b*B^2*PolyLog[2, -((d*
(a + b*x))/(b*c - a*d))])/(g*(b*f - a*g)) + (2*B^2*d*PolyLog[2, (b*(c + d*x
))/(b*c - a*d)])/(g*(d*f - c*g)) - (2*B^2*(b*c - a*d)*PolyLog[2, (b*(f + g*
x))/(b*f - a*g)])/((b*f - a*g)*(d*f - c*g)) + (2*B^2*(b*c - a*d)*PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)])/((b*f - a*g)*(d*f - c*g))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
```

```
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{(2B(bc-ad))\int\left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(-df+cg)(c+dx)} + \frac{g^2(A \cdots}{(bf-a\cdots} \cdots}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{\left(2b^2B\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{g(bf-ag)} - \frac{\left(2Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{g(df-cg)} + \frac{(2B \cdots}{\cdots}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right) \cdots\right.}{g(df-cg)}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right) \cdots\right.}{g(df-cg)}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right) \cdots\right.}{g(df-cg)}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} - \frac{2Bd\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right) \cdots\right.}{g(df-cg)}$$

$$= \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{2B^2d\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log(\cdots}{g(df-cg)}$$

$$= -\frac{bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{2B \cdots}{\cdots}$$

$$= -\frac{bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{2bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{g(f+gx)} + \frac{2B \cdots}{\cdots}$$

Mathematica [B] time = 0.958893, size = 402, normalized size = 2.05

$$\frac{B\left(-bB(df-cg)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(bf-ag)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2Bg(b \cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)) + (B*(2*b*(d*f - c*g)*
Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*d*(b*f - a*g)*(A + B*
Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] + 2*(b*c - a*d)*g*(A + B*Log[(e*
(a + b*x))/(c + d*x)])*Log[f + g*x] - b*B*(d*f - c*g)*(Log[a + b*x]*(Log[a
+ b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(
b*c) + a*d)]) + B*d*(b*f - a*g)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log
[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 2*B*(b
*c - a*d)*g*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f)
 + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)*(d*f - c*g)))/g
```

Maple [F] time = 2.067, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,AB\left(\frac{b\log\left(bx+a\right)}{bfg-ag^{2}}-\frac{d\log\left(dx+c\right)}{dfg-cg^{2}}+\frac{\left(bc-ad\right)\log\left(gx+f\right)}{bdf^{2}+acg^{2}-\left(bc+ad\right)fg}-\frac{\log\left(\frac{bex}{dx+c}+\frac{ae}{dx+c}\right)}{g^{2}x+fg}\right)-B^{2}\left(\frac{\log\left(dx+c\right)^{2}}{g^{2}x+fg}+\int-\frac{dgx\,[illegible]}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] 2*A*B*(b*log(b*x + a)/(b*f*g - a*g^2) - d*log(d*x + c)/(d*f*g - c*g^2) + (b
*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b*e*x/(d
```

```
*x + c) + a*e/(d*x + c))/(g^2*x + f*g)) - B^2*(log(d*x + c)^2/(g^2*x + f*g)
 + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + (d*g*x + c*g)*log(b*x + a)^2
 + 2*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 2*((g*log(e) - g)*d*x + c*g
*log(e) - d*f + (d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(d*g^3*x^3 + c*f^
2*g + (2*d*f*g^2 + c*g^3)*x^2 + (d*f^2*g + 2*c*f*g^2)*x), x)) - A^2/(g^2*x
+ f*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{g^2x^2+2\,fgx+f^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^2*x^2 + 2*f*g*x + f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(gx+f\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(g*x + f)^2, x)
```

3.246 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^3}\,dx$

Optimal. Leaf size=369

$$\frac{B^2(bc-ad)(-adg-bcg+2bdf)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{(bf-ag)^2(df-cg)^2}+\frac{b^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2}{2g(bf-ag)^2}+\frac{Bg(a+bx)(bc-ad)\left(B\log\left(\frac{e(a+\cdots}{c+\cdots}\right.\right.}{(f+gx)(bf-ag)^2(df-\cdots}$$

```
[Out] (B*(b*c - a*d)*g*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*f - a*
g)^2*(d*f - c*g)*(f + g*x)) + (b^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/
(2*g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(2*g*(f + g*x)
^2) + (B^2*(b*c - a*d)^2*g*Log[(f + g*x)/(c + d*x)])/((b*f - a*g)^2*(d*f -
c*g)^2) + (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x))
/(c + d*x)])*Log[1 - ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b*
f - a*g)^2*(d*f - c*g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Poly
Log[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b*f - a*g)^2*(d*
f - c*g)^2)
```

Rubi [B] time = 1.48104, antiderivative size = 883, normalized size of antiderivative = 2.39, number of steps used = 36, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2\log^2(a+bx)b^2}{2g(bf-ag)^2}+\frac{B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^2}{g(bf-ag)^2}+\frac{B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^2}{g(bf-ag)^2}+\frac{B^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\cdots}{g(bf-ag)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^3,x]
```

```
[Out] (b*B^2*(b*c - a*d)*Log[a + b*x])/((b*f - a*g)^2*(d*f - c*g)) - (b^2*B^2*Log
[a + b*x]^2)/(2*g*(b*f - a*g)^2) - (B*(b*c - a*d)*(A + B*Log[(e*(a + b*x))/
(c + d*x)]))/((b*f - a*g)*(d*f - c*g)*(f + g*x)) + (b^2*B*Log[a + b*x]*(A +
 B*Log[(e*(a + b*x))/(c + d*x)]))/(g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*
x))/(c + d*x)])^2/(2*g*(f + g*x)^2) - (B^2*d*(b*c - a*d)*Log[c + d*x])/((b*
f - a*g)*(d*f - c*g)^2) + (B^2*d^2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c
+ d*x])/(g*(d*f - c*g)^2) - (B*d^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log
[c + d*x])/(g*(d*f - c*g)^2) - (B^2*d^2*Log[c + d*x]^2)/(2*g*(d*f - c*g)^2)
 + (b^2*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g)^2)
+ (B^2*(b*c - a*d)^2*g*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) - (B^2*(
```

```
b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[
f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x])/((b*f - a*g)^2*(
d*f - c*g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[-((g*(c + d*
x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (b^2*B^2*Po
lyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f - a*g)^2) + (B^2*d^2*PolyLo
g[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*g)^2) - (B^2*(b*c - a*d)*(2*b*
d*f - b*c*g - a*d*g)*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)^2*
(d*f - c*g)^2) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLog[2, (d*(
f + g*x))/(d*f - c*g)])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2} + \frac{B\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2} + \frac{(B(bc-ad))\int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)^2(a+bx)} - \frac{d^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(-df+cg)^2(c+dx)} + \frac{g^2 \cdots}{(bf \cdots}\right.}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{2g(f+gx)^2} + \frac{\left(b^3B\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{g(bf-ag)^2} - \frac{\left(Bd^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{g(df-cg)^2} + \frac{(B(b \cdots}{\cdots}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)^2} - \frac{\left(A+B\log \cdots\right.}{2g(f+\cdots}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)^2} - \frac{\left(A+B\log \cdots\right.}{2g(f+\cdots}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{g(bf-ag)^2} - \frac{\left(A+B\log \cdots\right.}{2g(f+\cdots}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)\left(A+B\,\mathrm{lo}\cdots\right.}{g(bf-ag)^2}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\log(a+bx)\left(A+B\,\mathrm{lo}\cdots\right.}{g(bf-ag)^2}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{b^2B^2\log^2(a+bx)}{2g(bf-ag)^2} - \frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\cdots}{\cdots}$$

$$= \frac{bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{b^2B^2\log^2(a+bx)}{2g(bf-ag)^2} - \frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{b^2B\cdots}{\cdots}$$

Mathematica [A] time = 2.0669, size = 595, normalized size = 1.61

$$-\frac{B(f+gx)\left(b^2B(f+gx)(df-cg)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\mathrm{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-Bd^2(f+gx)(bf-ag)^2\left(2\mathrm{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d\cdots}{\cdots}\right.\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^3,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(f + g*x)*(2*(b*c - a*d)*g*(b
*f - a*g)*(d*f - c*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)]) - 2*b^2*(d*f - c
*g)^2*(f + g*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d^2*(
b*f - a*g)^2*(f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] +
2*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*Log[(e*(a + b*x
))/(c + d*x)])*Log[f + g*x] - 2*B*(b*c - a*d)*g*(f + g*x)*(b*(d*f - c*g)*Lo
g[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x])
+ b^2*B*(d*f - c*g)^2*(f + g*x)*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c +
 d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - B*d^2*
(b*f - a*g)^2*(f + g*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x
])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) - 2*B*(b*c - a*d
)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*((Log[(g*(a + b*x))/(-(b*f) + a*g)
] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*
x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)^2*
(d*f - c*g)^2))/(2*g*(f + g*x)^2)
```

Maple [F] time = 2.909, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(\frac{b^2\log(bx+a)}{b^2f^2g-2abfg^2+a^2g^3}-\frac{d^2\log(dx+c)}{d^2f^2g-2cdfg^2+c^2g^3}+\frac{\left(2\left(b^2cd-abd^2\right)f-\left(b^2c^2-a^2d^2\right)g\right)\log\left(gx+\right.}{b^2d^2f^4+a^2c^2g^4-2\left(b^2cd+abd^2\right)f^3g+\left(b^2c^2+4abcd+a^2d^2\right)f^2g}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] (b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - d^2*log(d*x + c)/(d
^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + (2*(b^2*c*d - a*b*d^2)*f - (b^2*c^2 - a
^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b*d^2)*
f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*d)*f*g
^3) - (b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f^2*g + a
*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b*e*x/(d*x + c) + a*e/(d*x + c))/(g^3*
x^2 + 2*f*g^2*x + f^2*g))*A*B - 1/2*B^2*(log(d*x + c)^2/(g^3*x^2 + 2*f*g^2*
x + f^2*g) + 2*integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + (d*g*x + c*g)*lo
g(b*x + a)^2 + 2*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - ((2*g*log(e) -
g)*d*x + 2*c*g*log(e) - d*f + 2*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(
d*g^4*x^4 + c*f^3*g + (3*d*f*g^3 + c*g^4)*x^3 + 3*(d*f^2*g^2 + c*f*g^3)*x^2
 + (d*f^3*g + 3*c*f^2*g^2)*x), x)) - 1/2*A^2/(g^3*x^2 + 2*f*g^2*x + f^2*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{g^3x^3+3\,fg^2x^2+3\,f^2gx+f^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^3*x^3 + 3*f*g^2*x^2 + 3*f^2*g*x + f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(gx+f\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(g*x + f)^3, x)
```

3.247 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^4}\,dx$

Optimal. Leaf size=714

$$\frac{2B^2(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{3(bf-ag)^3(df-cg)^3}+\frac{2B(bc-ad)\left(a^2d^2g^2\right.}{}$$

```
[Out] (B^2*(b*c - a*d)^2*g^2*(c + d*x))/(3*(b*f - a*g)^2*(d*f - c*g)^3*(f + g*x))
 + (B^2*(b*c - a*d)^3*g^2*Log[(a + b*x)/(c + d*x)])/(3*(b*f - a*g)^3*(d*f -
 c*g)^3) - (B*(b*c - a*d)*g^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x
)]))/(3*(b*f - a*g)*(d*f - c*g)^3*(f + g*x)^2) + (2*B*(b*c - a*d)*g*(3*b*d*
f - b*c*g - 2*a*d*g)*(a + b*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*
f - a*g)^3*(d*f - c*g)^2*(f + g*x)) + (b^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)])^2)/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(3*g*(
f + g*x)^3) - (B^2*(b*c - a*d)^3*g^2*Log[(f + g*x)/(c + d*x)])/(3*(b*f - a*
g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)^2*g*(3*b*d*f - b*c*g - 2*a*d*g)*Lo
g[(f + g*x)/(c + d*x)])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B*(b*c - a*d)*
(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2
))*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - ((d*f - c*g)*(a + b*x))/((b
*f - a*g)*(c + d*x))])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)
*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^
2))*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/(3*(b*f -
a*g)^3*(d*f - c*g)^3)
```

Rubi [A] time = 2.38124, antiderivative size = 1356, normalized size of antiderivative = 1.9, number of steps used = 40, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{B^2\log^2(a+bx)b^3}{3g(bf-ag)^3}+\frac{2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^3}{3g(bf-ag)^3}+\frac{2B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^3}{3g(bf-ag)^3}+\frac{2B^2\text{PolyLog}\left(2,-\frac{d(a}{bc}\right.}{3g(bf-ag)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^4,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^2*B^2
*(b*c - a*d)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)) + (2*b*B^2*(b*c -
a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)^2
```

```
) - (b^3*B^2*Log[a + b*x]^2)/(3*g*(b*f - a*g)^3) - (B*(b*c - a*d)*(A + B*Lo
g[(e*(a + b*x))/(c + d*x)]))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (2*B
*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*b^3*B*Log[a + b*x]*(A + B*
Log[(e*(a + b*x))/(c + d*x)]))/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x
))/(c + d*x)])^2/(3*g*(f + g*x)^3) - (B^2*d^2*(b*c - a*d)*Log[c + d*x])/(3*
(b*f - a*g)*(d*f - c*g)^3) - (2*B^2*d*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)
*Log[c + d*x])/(3*(b*f - a*g)^2*(d*f - c*g)^3) + (2*B^2*d^3*Log[-((d*(a + b
*x))/(b*c - a*d))]*Log[c + d*x])/(3*g*(d*f - c*g)^3) - (2*B*d^3*(A + B*Log[
(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(3*g*(d*f - c*g)^3) - (B^2*d^3*Log[
c + d*x]^2)/(3*g*(d*f - c*g)^3) + (2*b^3*B^2*Log[a + b*x]*Log[(b*(c + d*x))
/(b*c - a*d)])/(3*g*(b*f - a*g)^3) + (B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g
- a*d*g)*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3) - (2*B^2*(b*c - a*d)*(
a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)
)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c
*g)^3) + (2*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2
*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g
*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*
b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[-((g*(c +
d*x))/(d*f - c*g))]*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (2*b^3*
B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*g*(b*f - a*g)^3) + (2*B^2*
d^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*g*(d*f - c*g)^3) - (2*B^2*(b*
c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g
+ c^2*g^2))*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/(3*(b*f - a*g)^3*(d*f -
c*g)^3) + (2*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*
d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/(3*(
b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
```

```
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3} + \frac{(2B)\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3} + \frac{(2B(bc-ad))\int \left(\frac{b^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)^3(a+bx)} + \frac{d^4\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(-df+cg)^3(c+dx)} + \cdots}{\cdots}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{3g(f+gx)^3} + \frac{\left(2b^4B\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{3g(bf-ag)^3} - \frac{\left(2Bd^4\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{3g(df-cg)^3} + \cdots$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\cdots}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\cdots}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\cdots}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bdf-bc\cdots}{3(bf-ag)^3(\cdots}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bdf-bc\cdots}{3(bf-ag)^3(\cdots}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bdf-bc\cdots}{3(bf-ag)^3(\cdots}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{2bB^2(bc-ad)(2bdf-bc\cdots}{3(bf-ag)^3(\cdots}$$

Mathematica [A] time = 4.224, size = 894, normalized size = 1.25

$$-\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2 + \frac{B(f+gx)\left(2d^3(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)\log(c+dx)(bf-ag)^3 - Bd^3(f+gx)^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+dx)+2\text{PolyLo}\cdots\right.}{\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^4,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x))/(c + d*x)])^2 + (B*(f + g*x)*((b*c - a*d)*g*(b*f
 - a*g)^2*(d*f - c*g)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*(b*c - a*d
)*g*(b*f - a*g)*(-(d*f) + c*g)*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*
Log[(e*(a + b*x))/(c + d*x)]) - 2*b^3*(d*f - c*g)^3*(f + g*x)^2*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]) + 2*d^3*(b*f - a*g)^3*(f + g*x)^2*(A
 + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x] - 2*(b*c - a*d)*g*(a^2*d^2*
g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(f +
g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x] - 2*B*(b*c - a*d)*
g*(2*b*d*f - b*c*g - a*d*g)*(f + g*x)^2*(b*(d*f - c*g)*Log[a + b*x] + (-(b*
d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*x]) + B*(b*c - a*d)*g*
(f + g*x)*((b*c - a*d)*g*(b*f - a*g)*(d*f - c*g) - b^2*(d*f - c*g)^2*(f + g
*x)*Log[a + b*x] + d^2*(b*f - a*g)^2*(f + g*x)*Log[c + d*x] + (b*c - a*d)*g
*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*Log[f + g*x]) + b^3*B*(d*f - c*g)^3*(
f + g*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) - B*d^3*(b*f - a*g)^3*(f + g*
x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2
*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 2*B*(b*c - a*d)*g*(a^2*d^2*g^2 +
a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(f + g*x)^2
*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*L
og[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*
x))/(d*f - c*g)])))/((b*f - a*g)^3*(d*f - c*g)^3))/(3*g*(f + g*x)^3)
```

Maple [F] time = 4.183, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{4}}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - 2*log(b*e*x/(d*x + c) + a*e/(d*
x + c))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*A*B - 1/3*B^2*(log(d
*x + c)^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) + 3*integrate(-1/3*
(3*d*g*x*log(e)^2 + 3*c*g*log(e)^2 + 3*(d*g*x + c*g)*log(b*x + a)^2 + 6*(d*
g*x*log(e) + c*g*log(e))*log(b*x + a) - 2*((3*g*log(e) - g)*d*x + 3*c*g*log
(e) - d*f + 3*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(d*g^5*x^5 + c*f^4*
g + (4*d*f*g^4 + c*g^5)*x^4 + 2*(3*d*f^2*g^3 + 2*c*f*g^4)*x^3 + 2*(2*d*f^3*
g^2 + 3*c*f^2*g^3)*x^2 + (d*f^4*g + 4*c*f^3*g^2)*x), x)) - 1/3*A^2/(g^4*x^3
 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{g^4x^4+4\,fg^3x^3+6\,f^2g^2x^2+4\,f^3gx+f^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^4*x^4 + 4*f*g^3*x^3 + 6*f^2*g^2*x^2 + 4*f^3*g*x + f^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(gx+f\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(g*x + f)^4, x)
```

3.248 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^5}\,dx$

Optimal. Leaf size=1159

result too large to display

```
[Out] -(B^2*(b*c - a*d)^2*g^3*(c + d*x)^2)/(12*(b*f - a*g)^2*(d*f - c*g)^4*(f + g
*x)^2) - (B^2*(b*c - a*d)^3*g^3*(c + d*x))/(6*(b*f - a*g)^3*(d*f - c*g)^4*(
f + g*x)) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*(c + d*x))/(
4*(b*f - a*g)^3*(d*f - c*g)^4*(f + g*x)) - (B^2*(b*c - a*d)^4*g^3*Log[(a +
b*x)/(c + d*x)])/(6*(b*f - a*g)^4*(d*f - c*g)^4) + (B^2*(b*c - a*d)^3*g^2*(
4*b*d*f - b*c*g - 3*a*d*g)*Log[(a + b*x)/(c + d*x)])/(4*(b*f - a*g)^4*(d*f
- c*g)^4) + (B*(b*c - a*d)*g^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*
x)]))/(6*(b*f - a*g)*(d*f - c*g)^4*(f + g*x)^3) - (B*(b*c - a*d)*g^2*(4*b*d
*f - b*c*g - 3*a*d*g)*(c + d*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(4*
(b*f - a*g)^2*(d*f - c*g)^4*(f + g*x)^2) + (B*(b*c - a*d)*g*(3*a^2*d^2*g^2
- 2*a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x
)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*f - a*g)^4*(d*f - c*g)^3*(f +
 g*x)) + (b^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2)/(4*g*(b*f - a*g)^4) -
 (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(4*g*(f + g*x)^4) + (B^2*(b*c - a*d
)^4*g^3*Log[(f + g*x)/(c + d*x)])/(6*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b
*c - a*d)^3*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*Log[(f + g*x)/(c + d*x)])/(4*(b
*f - a*g)^4*(d*f - c*g)^4) + (B^2*(b*c - a*d)^2*g*(3*a^2*d^2*g^2 - 2*a*b*d*
g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[(f + g*x)/(c +
 d*x)])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*b*d*f - b*c*g -
 a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2
))*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[1 - ((d*f - c*g)*(a + b*x))/((b
*f - a*g)*(c + d*x))])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*
c*d*f*g + c^2*g^2))*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*
x))])/(2*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rubi [A] time = 3.4031, antiderivative size = 1881, normalized size of antiderivative = 1.62, number of steps used = 44, number of rules used = 11, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.379, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g)/(12*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (5*B^
2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g))/(12*(b*f - a*g)^3*(d*f - c*g)^
3*(f + g*x)) + (b^3*B^2*(b*c - a*d)*Log[a + b*x])/(6*(b*f - a*g)^4*(d*f - c
*g)) + (b^2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/(4*(b*f
 - a*g)^4*(d*f - c*g)^2) + (b*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f
 - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[a + b*x])/(2*(b*f - a*
g)^4*(d*f - c*g)^3) - (b^4*B^2*Log[a + b*x]^2)/(4*g*(b*f - a*g)^4) - (B*(b*
c - a*d)*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(6*(b*f - a*g)*(d*f - c*g)*(
f + g*x)^3) - (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b
*x))/(c + d*x)]))/(4*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*(b*c - a
*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2
*g^2))*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*(b*f - a*g)^3*(d*f - c*g)^3
*(f + g*x)) + (b^4*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(2*
g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(4*g*(f + g*x)^4)
 - (B^2*d^3*(b*c - a*d)*Log[c + d*x])/(6*(b*f - a*g)*(d*f - c*g)^4) - (B^2*
d^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(4*(b*f - a*g)^2*(d
*f - c*g)^4) - (B^2*d*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^
2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[c + d*x])/(2*(b*f - a*g)^3*(d*f -
c*g)^4) + (B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(2*g*(d*
f - c*g)^4) - (B*d^4*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/(2*
g*(d*f - c*g)^4) - (B^2*d^4*Log[c + d*x]^2)/(4*g*(d*f - c*g)^4) + (b^4*B^2*
Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(2*g*(b*f - a*g)^4) + (B^2*(b*
c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)^2*Log[f + g*x])/(4*(b*f - a*g)^4*(d*
f - c*g)^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) +
 b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a*g)^4*(d*f
 - c*g)^4) + (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^
2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[-((g*(a + b*x))/(b*f
 - a*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c - a*d)*(2
*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c
*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[f + g*x])/(2*(b
*f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*
a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[-((g
*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4) + (
b^4*B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(2*g*(b*f - a*g)^4) + (B^
2*d^4*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(2*g*(d*f - c*g)^4) + (B^2*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^
2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/(2*(b*
f - a*g)^4*(d*f - c*g)^4) - (B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a
*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2
, (d*(f + g*x))/(d*f - c*g)])/(2*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{(f+gx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{B\int \frac{(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \left(\frac{b^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{(bc-ad)(-df+cg)^4(c+dx)} + \frac{g^2}{(bf}\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}{4g(f+gx)^4} + \frac{\left(b^5B\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{a+bx}\,dx}{2g(bf-ag)^4} - \frac{\left(Bd^5\right)\int \frac{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}{c+dx}\,dx}{2g(df-cg)^4} + \frac{(B(b}{}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{6(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}{4(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc-ad)}{6(bf-ag)^4}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc-ad)}{6(bf-ag)^4}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc-ad)}{6(bf-ag)^4}$$

$$= -\frac{B^2(bc-ad)^2g}{12(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{12(bf-ag)^3(df-cg)^3(f+gx)} + \frac{b^3B^2(bc-ad)}{6(bf-ag)^4}$$

<u>Mathematica</u> [A] time = 7.31149, size = 1448, normalized size = 1.25

$$\frac{B(bc-ad)\left(\frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)b^4}{(bc-ad)(bf-ag)^4}-\frac{B\left(\log^2(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a+bx)-2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\right)b^4}{2(bc-ad)(bf-ag)^4}-\frac{g\left(\left(3d^2f^2-3cdgf+c^2g^2\right)b^2-adg(3df-\cdots}{(bf-ag)^3(df-\cdots}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(f + g*x)^5,x]
```

```
[Out] -(A + B*Log[(e*(a + b*x))/(c + d*x)])^2/(4*g*(f + g*x)^4) + (B*(b*c - a*d)*
(-(g*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/(3*(b*f - a*g)*(d*f - c*g)*(f +
g*x)^3) - (g*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x))/(c + d*x)])
)/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 - a*b*d*g*(
3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*
x))/(c + d*x)]))/((b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*Log[a + b*x
]*(A + B*Log[(e*(a + b*x))/(c + d*x)]))/((b*c - a*d)*(b*f - a*g)^4) - (d^4*
(A + B*Log[(e*(a + b*x))/(c + d*x)])*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)
^4) + (g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 - 2*b^2*c*d*f*g - 2*a*b*d
^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(A + B*Log[(e*(a + b*x))/(c + d*x)])*Lo
g[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) + (B*(b*c - a*d)*g*(a^2*d^2*g^2 -
 a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*((b*Log[a +
 b*x])/((b*c - a*d)*(b*f - a*g)) - (d*Log[c + d*x])/((b*c - a*d)*(d*f - c*g
)) + (g*Log[f + g*x])/((b*f - a*g)*(d*f - c*g))))/((b*f - a*g)^3*(d*f - c*g
)^3) - (B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*(g/((b*f - a*g)*(d*f - c*
g)*(f + g*x)) - (b^2*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + (d^2*Log[c
 + d*x])/((b*c - a*d)*(d*f - c*g)^2) - (g*(2*b*d*f - b*c*g - a*d*g)*Log[f +
 g*x])/((b*f - a*g)^2*(d*f - c*g)^2)))/(2*(b*f - a*g)^2*(d*f - c*g)^2) - (B
*(b*c - a*d)*g*(g/((b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (2*g*(2*b*d*f - b
*c*g - a*d*g))/((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) - (2*b^3*Log[a + b*x
])/((b*c - a*d)*(b*f - a*g)^3) + (2*d^3*Log[c + d*x])/((b*c - a*d)*(d*f - c
*g)^3) - (2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d
*f*g + c^2*g^2))*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(6*(b*f - a*
g)*(d*f - c*g)) - (b^4*B*(Log[a + b*x]^2 - 2*Log[a + b*x]*Log[(b*(c + d*x))
/(b*c - a*d)] - 2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))]))/(2*(b*c - a*d)
*(b*f - a*g)^4) + (B*d^4*(2*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x]
- Log[c + d*x]^2 + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(2*(b*c - a*d)
*(d*f - c*g)^4) - (B*g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 - 2*b^2*c*d
*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(Log[-((g*(a + b*x))/(b*f
 - a*g))]*Log[f + g*x] - Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x] + P
olyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)
]))/((b*f - a*g)^4*(d*f - c*g)^4)))/(2*g)
```

Maple [F] time = 6.561, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{5}}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x)

[Out] int((A+B*ln(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x, algorithm="maxima")

[Out] 1/12*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
```

```
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 6*log(b*e*x/(d*x + c) + a*
e/(d*x + c))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g))
*A*B - 1/4*B^2*(log(d*x + c)^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f
^3*g^2*x + f^4*g) + 4*integrate(-1/2*(2*d*g*x*log(e)^2 + 2*c*g*log(e)^2 + 2
*(d*g*x + c*g)*log(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a)
- ((4*g*log(e) - g)*d*x + 4*c*g*log(e) - d*f + 4*(d*g*x + c*g)*log(b*x + a)
)*log(d*x + c))/(d*g^6*x^6 + c*f^5*g + (5*d*f*g^5 + c*g^6)*x^5 + 5*(2*d*f^2
*g^4 + c*f*g^5)*x^4 + 10*(d*f^3*g^3 + c*f^2*g^4)*x^3 + 5*(d*f^4*g^2 + 2*c*f
^3*g^3)*x^2 + (d*f^5*g + 5*c*f^4*g^2)*x), x)) - 1/4*A^2/(g^5*x^4 + 4*f*g^4*
x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2}{g^5x^5+5\,fg^4x^4+10\,f^2g^3x^3+10\,f^3g^2x^2+5\,f^4gx+f^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d*x
 + c)) + A^2)/(g^5*x^5 + 5*f*g^4*x^4 + 10*f^2*g^3*x^3 + 10*f^3*g^2*x^2 + 5*
f^4*g*x + f^5), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)/(d*x+c)))**2/(g*x+f)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}{\left(gx+f\right)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)/(d*x+c)))^2/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^2/(g*x + f)^5, x)
```

3.249 $\int \frac{\log\left(\frac{1+x}{-1+x}\right)}{x^2} dx$

Optimal. Leaf size=35

$$2\log\left(-\frac{x}{1-x}\right)-\frac{(x+1)\log\left(-\frac{x+1}{1-x}\right)}{x}$$

```
[Out] 2*Log[-(x/(1 - x))] - ((1 + x)*Log[-((1 + x)/(1 - x))])/x
```

Rubi [A] time = 0.0142757, antiderivative size = 34, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2490, 36, 29, 31}

$$2\log(x)-2\log(x+1)-\frac{(1-x)\log\left(-\frac{x+1}{1-x}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[Log[(1 + x)/(-1 + x)]/x^2,x]
```

```
[Out] 2*Log[x] - 2*Log[1 + x] - ((1 - x)*Log[-((1 + x)/(1 - x))])/x
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\log\left(\frac{1+x}{-1+x}\right)}{x^2}\,dx &= -\frac{(1-x)\log\left(-\frac{1+x}{1-x}\right)}{x}+2\int \frac{1}{x(1+x)}\,dx\\ &= -\frac{(1-x)\log\left(-\frac{1+x}{1-x}\right)}{x}+2\int \frac{1}{x}\,dx-2\int \frac{1}{1+x}\,dx\\ &= 2\log(x)-2\log(1+x)-\frac{(1-x)\log\left(-\frac{1+x}{1-x}\right)}{x}\end{aligned}$$

Mathematica [A] time = 0.0053786, size = 30, normalized size = 0.86

$$-\log\left(1-x^2\right)+2\log(x)-\frac{\log\left(\frac{x+1}{x-1}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[(1 + x)/(-1 + x)]/x^2,x]
```

```
[Out] 2*Log[x] - Log[(1 + x)/(-1 + x)]/x - Log[1 - x^2]
```

Maple [A] time = 0.131, size = 46, normalized size = 1.3

$$2\,\ln\left(2\,(x-1)^{-1}+2\right)-2\ln\left(1+2\,(x-1)^{-1}\right)\left(1+2\,(x-1)^{-1}\right)\left(2\,(x-1)^{-1}+2\right)^{-1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln((1+x)/(x-1))/x^2,x)
```

```
[Out] 2*ln(2/(x-1)+2)-2*ln(1+2/(x-1))*(1+2/(x-1))/(2/(x-1)+2)
```

Maxima [A] time = 1.12857, size = 43, normalized size = 1.23

$$-\frac{\log\left(\frac{x+1}{x-1}\right)}{x} - \log\left(x+1\right) - \log\left(x-1\right) + 2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((1+x)/(-1+x))/x^2,x, algorithm="maxima")
```

```
[Out] -log((x + 1)/(x - 1))/x - log(x + 1) - log(x - 1) + 2*log(x)
```

Fricas [A] time = 0.947874, size = 77, normalized size = 2.2

$$-\frac{x\log\left(x^2-1\right) - 2\,x\log\left(x\right) + \log\left(\frac{x+1}{x-1}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((1+x)/(-1+x))/x^2,x, algorithm="fricas")
```

```
[Out] -(x*log(x^2 - 1) - 2*x*log(x) + log((x + 1)/(x - 1)))/x
```

Sympy [A] time = 0.140983, size = 20, normalized size = 0.57

$$2\log\left(x\right) - \log\left(x^2-1\right) - \frac{\log\left(\frac{x+1}{x-1}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln((1+x)/(-1+x))/x**2,x)
```

```
[Out] 2*log(x) - log(x**2 - 1) - log((x + 1)/(x - 1))/x
```

Giac [A] time = 1.26509, size = 39, normalized size = 1.11

$$-\frac{\log\left(\frac{x+1}{x-1}\right)}{x} + \log\left(x^2\right) - \log\left(\left|x^2 - 1\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log((1+x)/(-1+x))/x^2,x, algorithm="giac")
```

```
[Out] -log((x + 1)/(x - 1))/x + log(x^2) - log(abs(x^2 - 1))
```

3.250 $\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{(f+gx)^2}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi [A] time = 0.168348, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + 2*f*g*Defer[
Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x] + g^2*Defer[Int][x^2/(A + B
*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{f^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{2fgx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{g^2x^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= f^2\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+(2fg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+g^2\int \frac{x^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.420802, size = 0, normalized size = 0.

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Maple [A] time = 1.279, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{2}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int((g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(gx+f\right)^{2}}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{g^{2}x^{2}+2\,fgx+f^{2}}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(gx+f\right)^2}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

3.251 $\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=29

$$\text{Unintegrable}\left(\frac{f+gx}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi [A] time = 0.0903596, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x] + g*Defer[Int][x
/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx &= \int \left(\frac{f}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}+\frac{gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\right)dx\\ &= f\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx+g\int \frac{x}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.244547, size = 0, normalized size = 0.

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]),x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)]), x]
```

Maple [A] time = 1.067, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{gx+f}{B\log\left(\frac{bex+ae}{dx+c}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

3.252 $\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$

Optimal. Leaf size=23

$$\text{Unintegrable}\left(\frac{1}{B\log\left(\frac{e(a+bx)}{c+dx}\right)+A},x\right)$$

```
[Out] Unintegrable[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x]
```

Rubi [A] time = 0.0136068, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1),x]

[Out] Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x]
```

Rubi steps

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx = \int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Mathematica [A] time = 0.0231281, size = 0, normalized size = 0.

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)}{c+dx}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-1), x]
```

Maple [A] time = 1.074, size = 0, normalized size = 0.

$$\int \left(A+B\ln \left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int(1/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{B\log\left(\frac{bex+ae}{dx+c}\right)+A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(B*log((b*e*x + a*e)/(d*x + c)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{B\log\left(\frac{(bx+a)e}{dx+c}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/(B*log((b*x + a)*e/(d*x + c)) + A), x)
```

3.253 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi [A] time = 0.0650778, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]

[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.905712, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]

[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Maple [A] time = 1.409, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)

[Out] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")

[Out] integrate(1/((g*x + f)*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Agx+Af+\left(Bgx+Bf\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*g*x + A*f + (B*g*x + B*f)*log((b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

3.254 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi [A] time = 0.065483, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]

[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 0.883091, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Maple [A] time = 1.366, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}} \left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ag^{2}x^{2}+2\,Afgx+Af^{2}+\left(Bg^{2}x^{2}+2\,Bfgx+Bf^{2}\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*g^2*x^2 + 2*A*f*g*x + A*f^2 + (B*g^2*x^2 + 2*B*f*g*x + B*f^2)
*log((b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

3.255 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi [A] time = 0.0614351, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Mathematica [A] time = 8.46788, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])), x]
```

Maple [A] time = 1.424, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3}\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ag^3x^3+3\,Afg^2x^2+3\,Af^2gx+Af^3+\left(Bg^3x^3+3\,Bfg^2x^2+3\,Bf^2gx+Bf^3\right)\log\left(\frac{bex+ae}{dx+c}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="fricas")
```

```
[Out] integral(1/(A*g^3*x^3 + 3*A*f*g^2*x^2 + 3*A*f^2*g*x + A*f^3 + (B*g^3*x^3 +
3*B*f*g^2*x^2 + 3*B*f^2*g*x + B*f^3)*log((b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)/(d*x+c))),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c))),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)*e/(d*x + c)) + A)), x)
```

3.256 $\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{(f+gx)^2}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi [A] time = 0.184068, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + 2*f*g*Defer[
Int][x/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x] + g^2*Defer[Int][x^2/(A +
 B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx = \int \left(\frac{f^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{2fgx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx$$
$$= f^2\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+(2fg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+g^2\int \frac{x^2}{\left(A+B\log\left(\right.\right.}$$

Mathematica [A] time = 1.31223, size = 0, normalized size = 0.

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Maple [A] time = 1.112, size = 0, normalized size = 0.

$$\int (gx+f)^2\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdg^2x^4+acf^2+\left(adg^2+\left(2\,dfg+cg^2\right)b\right)x^3+\left(\left(2\,dfg+cg^2\right)a+\left(df^2+2\,cfg\right)b\right)x^2+\left(bcf^2+\left(df^2+2\,cfg\right)a\right)x}{(bc-ad)B^2\log(bx+a)-(bc-ad)B^2\log(dx+c)+(bc-ad)AB+(bc\log(e)-ad\log(e))B^2}+\int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*g^2*x^4 + a*c*f^2 + (a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^3 + ((2*d*f*g +
 c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x^2 + (b*c*f^2 + (d*f^2 + 2*c*f*g)*a)*x)/(
(b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A
*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate((4*b*d*g^2*x^3 + b*c*f^2 +
3*(a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^2 + (d*f^2 + 2*c*f*g)*a + 2*((2*d*f*g +
 c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c -
a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2), x
```

)

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{g^2x^2 + 2\,fgx + f^2}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,AB\log\left(\frac{bex+ae}{dx+c}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*
A*B*log((b*e*x + a*e)/(d*x + c)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(gx + f)^2}{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.257 $\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=29

$$\text{Unintegrable}\left(\frac{f+gx}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi [A] time = 0.0996355, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x] + g*Defer[Int][x
/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx &= \int \left(\frac{f}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}+\frac{gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\right)dx\\ &= f\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx+g\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.882346, size = 0, normalized size = 0.

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2,x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x))/(c + d*x)])^2, x]
```

Maple [A] time = 1.115, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(\frac{e(bx+a)}{dx+c}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdgx^3+acf+\left(adg+\left(df+cg\right)b\right)x^2+\left(bcf+\left(df+cg\right)a\right)x}{(bc-ad)B^2\log(bx+a)-(bc-ad)B^2\log(dx+c)+(bc-ad)AB+(bc\log(e)-ad\log(e))B^2}+\int\frac{3}{(bc-ad)B^2\log(bx+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*g*x^3 + a*c*f + (a*d*g + (d*f + c*g)*b)*x^2 + (b*c*f + (d*f + c*g)*a)
*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a
*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate((3*b*d*g*x^2 + b*c*f +
 (d*f + c*g)*a + 2*(a*d*g + (d*f + c*g)*b)*x)/((b*c - a*d)*B^2*log(b*x + a)
 - (b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e
))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{gx+f}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2+2\,AB\log\left(\frac{bex+ae}{dx+c}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x +
 a*e)/(d*x + c)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)*e/(d*x + c)) + A)^2, x)
```

3.258 $\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=23

$$\text{Unintegrable}\left(\frac{1}{\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x]
```

Rubi [A] time = 0.0141137, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2),x]

[Out] Defer[Int][(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x]
```

Rubi steps

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.478802, size = 0, normalized size = 0.

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x))/(c + d*x)])^(-2), x]
```

Maple [A] time = 1.079, size = 0, normalized size = 0.

$$\int \left(A + B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdx^2 + ac + (bc+ad)x}{(bc-ad)B^2\log(bx+a) - (bc-ad)B^2\log(dx+c) + (bc-ad)AB + (bc\log(e) - ad\log(e))B^2} + \int \frac{}{(bc-ad)B^2\log(bx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d
)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + int
egrate((2*b*d*x + b*c + a*d)/((b*c - a*d)*B^2*log(b*x + a) - (b*c - a*d)*B^
2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{B^2\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\,AB\log\left(\frac{bex+ae}{dx+c}\right) + A^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(B^2*log((b*e*x + a*e)/(d*x + c))^2 + 2*A*B*log((b*e*x + a*e)/(d
*x + c)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(B \log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)*e/(d*x + c)) + A)^(-2), x)
```

3.259 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi [A] time = 0.0696734, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]

[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 2.50478, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Maple [A] time = 1.425, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdx^2+ac+(bc+ad)x}{\left(bcf-adf\right)AB+\left(bcf\log(e)-adf\log(e)\right)B^2+\left(\left(bcg-adg\right)AB+\left(bcg\log(e)-adg\log(e)\right)B^2\right)x+\left(\left(bcg-adg\right)B^2x+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f - a*d*f)*A*B + (b*c*f*log(e) - a*d
*f*log(e))*B^2 + ((b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B^2)*
x + ((b*c*g - a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(b*x + a) - ((b*c*g -
a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(d*x + c)) + integrate((b*d*g*x^2 +
2*b*d*f*x + b*c*f + (d*f - c*g)*a)/((b*c*f^2 - a*d*f^2)*A*B + (b*c*f^2*log(
e) - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*log(e) - a*d
*g^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*log(e) - a*d*
f*g*log(e))*B^2)*x + ((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B
^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - ((b*c*g^2 - a*d*g^2)*B^2*x^2
 + 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(d*x + c)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABgx + ABf\right)\log\left(\frac{bex+ae}{dx+c}\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b*e*x + a*e)/(d*x + c)
)^2 + 2*(A*B*g*x + A*B*f)*log((b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx + f\right)\left(B\log\left(\frac{(bx+a)e}{dx+c}\right) + A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

3.260 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi [A] time = 0.0747316, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]

[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 4.41417, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Maple [A] time = 1.58, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}}\left(A+B\ln\left(\frac{e\,(bx+a)}{dx+c}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f^2 - a*d*f^2)*A*B + (b*c*f^2*log(e)
 - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*log(e) - a*d*g
^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*log(e) - a*d*f*
g*log(e))*B^2)*x + ((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B^2
*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - ((b*c*g^2 - a*d*g^2)*B^2*x^2 +
 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(d*x + c)) - int
egrate(-(b*c*f + (d*f - 2*c*g)*a - (a*d*g - (2*d*f - c*g)*b)*x)/(((b*c*g^3
- a*d*g^3)*A*B + (b*c*g^3*log(e) - a*d*g^3*log(e))*B^2)*x^3 + (b*c*f^3 - a*
d*f^3)*A*B + (b*c*f^3*log(e) - a*d*f^3*log(e))*B^2 + 3*((b*c*f*g^2 - a*d*f*
g^2)*A*B + (b*c*f*g^2*log(e) - a*d*f*g^2*log(e))*B^2)*x^2 + 3*((b*c*f^2*g -
 a*d*f^2*g)*A*B + (b*c*f^2*g*log(e) - a*d*f^2*g*log(e))*B^2)*x + ((b*c*g^3
- a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d
*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(b*x + a) - ((b*c*g^3 - a*d*g^3
)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B
^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(d*x + c)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2g^2x^2 + 2\,A^2fgx + A^2f^2 + \left(B^2g^2x^2 + 2\,B^2fgx + B^2f^2\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABg^2x^2 + 2\,ABfgx + ABf^2\right)\log\left(\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*
x + B^2*f^2)*log((b*e*x + a*e)/(d*x + c))^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x
+ A*B*f^2)*log((b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^2\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

3.261 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)}{c+dx}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi [A] time = 0.0697515, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]

[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Mathematica [A] time = 30.1188, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)}{c+dx}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x))/(c + d*x)])^2), x]
```

Maple [A] time = 1.841, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}} \left(A+B\ln\left(\frac{e\left(bx+a\right)}{dx+c}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

```
[Out] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)/(d*x+c)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="maxima")
```

```
[Out] -(b*d*x^2 + a*c + (b*c + a*d)*x)/(((b*c*g^3 - a*d*g^3)*A*B + (b*c*g^3*log(e
) - a*d*g^3*log(e))*B^2)*x^3 + (b*c*f^3 - a*d*f^3)*A*B + (b*c*f^3*log(e) -
a*d*f^3*log(e))*B^2 + 3*((b*c*f*g^2 - a*d*f*g^2)*A*B + (b*c*f*g^2*log(e) -
a*d*f*g^2*log(e))*B^2)*x^2 + 3*((b*c*f^2*g - a*d*f^2*g)*A*B + (b*c*f^2*g*lo
g(e) - a*d*f^2*g*log(e))*B^2)*x + ((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g
^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*
f^3)*B^2)*log(b*x + a) - ((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*
f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)
*log(d*x + c)) - integrate((b*d*g*x^2 - b*c*f - (d*f - 3*c*g)*a + 2*(a*d*g
- (d*f - c*g)*b)*x)/(((b*c*g^4 - a*d*g^4)*A*B + (b*c*g^4*log(e) - a*d*g^4*l
og(e))*B^2)*x^4 + 4*((b*c*f*g^3 - a*d*f*g^3)*A*B + (b*c*f*g^3*log(e) - a*d*
f*g^3*log(e))*B^2)*x^3 + (b*c*f^4 - a*d*f^4)*A*B + (b*c*f^4*log(e) - a*d*f^
4*log(e))*B^2 + 6*((b*c*f^2*g^2 - a*d*f^2*g^2)*A*B + (b*c*f^2*g^2*log(e) -
a*d*f^2*g^2*log(e))*B^2)*x^2 + 4*((b*c*f^3*g - a*d*f^3*g)*A*B + (b*c*f^3*g*
log(e) - a*d*f^3*g*log(e))*B^2)*x + ((b*c*g^4 - a*d*g^4)*B^2*x^4 + 4*(b*c*f
```

```
*g^3 - a*d*f*g^3)*B^2*x^3 + 6*(b*c*f^2*g^2 - a*d*f^2*g^2)*B^2*x^2 + 4*(b*c*
f^3*g - a*d*f^3*g)*B^2*x + (b*c*f^4 - a*d*f^4)*B^2)*log(b*x + a) - ((b*c*g^
4 - a*d*g^4)*B^2*x^4 + 4*(b*c*f*g^3 - a*d*f*g^3)*B^2*x^3 + 6*(b*c*f^2*g^2 -
 a*d*f^2*g^2)*B^2*x^2 + 4*(b*c*f^3*g - a*d*f^3*g)*B^2*x + (b*c*f^4 - a*d*f^
4)*B^2)*log(d*x + c)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(\frac{bex+ae}{dx+c}\right)^2 + 2\left(ABg\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*
g^3*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b*e*x + a*e)/(d*x
 + c))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2 + 3*A*B*f^2*g*x + A*B*f^3)*log(
(b*e*x + a*e)/(d*x + c))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)/(d*x+c)))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^3\left(B\log\left(\frac{(bx+a)e}{dx+c}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)/(d*x+c)))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)*e/(d*x + c)) + A)^2), x)
```

3.262 $\int (f+gx)^4 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx$

Optimal. Leaf size=357

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{5b^3d^3}+\frac{2Bgx(bc-ad)\left(-a^2bd^2g^2(5df-cg)+a^3d^3\right.}{}$$

```
[Out] (2*B*(b*c - a*d)*g*(a^3*d^3*g^3 - a^2*b*d^2*g^2*(5*d*f - c*g) + a*b^2*d*g*(
10*d^2*f^2 - 5*c*d*f*g + c^2*g^2) - b^3*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^
2*d*f*g^2 - c^3*g^3))*x)/(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*
b*d*g*(5*d*f - c*g) + b^2*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*x^2)/(5*b^3*d
^3) - (2*B*(b*c - a*d)*g^3*(5*b*d*f - b*c*g - a*d*g)*x^3)/(15*b^2*d^2) - (B
*(b*c - a*d)*g^4*x^4)/(10*b*d) - (2*B*(b*f - a*g)^5*Log[a + b*x])/(5*b^5*g)
 + ((f + g*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*g) + (2*B*(d*f
 - c*g)^5*Log[c + d*x])/(5*d^5*g)
```

Rubi [A] time = 0.50101, antiderivative size = 341, normalized size of antiderivative = 0.96, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$-\frac{Bg^2x^2(bc-ad)\left(a^2d^2g^2-abdg(5df-cg)+b^2\left(c^2g^2-5cdfg+10d^2f^2\right)\right)}{5b^3d^3}+\frac{2Bgx\left(-10a^2b^2d^4f^2g+5a^3bd^4fg^2-a^4d^4g\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (2*B*g*(10*a*b^3*d^4*f^3 - 10*a^2*b^2*d^4*f^2*g + 5*a^3*b*d^4*f*g^2 - a^4*d
^4*g^3 - b^4*c*(10*d^3*f^3 - 10*c*d^2*f^2*g + 5*c^2*d*f*g^2 - c^3*g^3))*x)/
(5*b^4*d^4) - (B*(b*c - a*d)*g^2*(a^2*d^2*g^2 - a*b*d*g*(5*d*f - c*g) + b^2
*(10*d^2*f^2 - 5*c*d*f*g + c^2*g^2))*x^2)/(5*b^3*d^3) - (2*B*(b*c - a*d)*g^
3*(5*b*d*f - b*c*g - a*d*g)*x^3)/(15*b^2*d^2) - (B*(b*c - a*d)*g^4*x^4)/(10
*b*d) - (2*B*(b*f - a*g)^5*Log[a + b*x])/(5*b^5*g) + ((f + g*x)^5*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]))/(5*g) + (2*B*(d*f - c*g)^5*Log[c + d*x])/(
5*d^5*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
```

```
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx=\frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5g}-\frac{B\int\frac{2(bc-ad)(f+gx)^5}{(a+bx)(c+dx)}dx}{5g}$$

$$=\frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5g}-\frac{(2B(bc-ad))\int\frac{(f+gx)^5}{(a+bx)(c+dx)}dx}{5g}$$

$$=\frac{(f+gx)^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{5g}-\frac{(2B(bc-ad))\int\left(\frac{g^2\left(-a^3d^3g^3+a^2bd^2g^2(5df-cg)-a\right.}{}\right.}{}$$

$$=\frac{2B(bc-ad)g\left(a^3d^3g^3-a^2bd^2g^2(5df-cg)+ab^2dg\left(10d^2f^2-5cdfg+c^2g^2\right)\right.}{5b^4d^4}$$

Mathematica [A] time = 0.587325, size = 282, normalized size = 0.79

$$\frac{\frac{Bg^2x(ad-bc)\left(6a^2bd^2g^2(-2cg+10df+dgx)-12a^3d^3g^3-2ab^2dg\left(6c^2g^2-3cdg(10f+gx)+d^2\left(60f^2+15fgx+2g^2x^2\right)\right)+b^3\left(6c^2dg^2(10f+gx)-12c^3g^3-2cd^2g\left(60f^2+15fgx\right.\right.\right.}{6b^4d^4}}{5g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] ((B*(-(b*c) + a*d)*g^2*x*(-12*a^3*d^3*g^3 + 6*a^2*b*d^2*g^2*(10*d*f - 2*c*g
 + d*g*x) - 2*a*b^2*d*g*(6*c^2*g^2 - 3*c*d*g*(10*f + g*x) + d^2*(60*f^2 + 1
5*f*g*x + 2*g^2*x^2)) + b^3*(-12*c^3*g^3 + 6*c^2*d*g^2*(10*f + g*x) - 2*c*d
^2*g*(60*f^2 + 15*f*g*x + 2*g^2*x^2) + d^3*(120*f^3 + 60*f^2*g*x + 20*f*g^2
*x^2 + 3*g^3*x^3))))/(6*b^4*d^4) - (2*B*(b*f - a*g)^5*Log[a + b*x])/b^5 + (
f + g*x)^5*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + (2*B*(d*f - c*g)^5*Lo
g[c + d*x])/d^5)/(5*g)
```

Maple [B] time = 0.318, size = 2438, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^4*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] -2/d^4*B*g^3*c^4*ln(1/(d*x+c))*f+4*B*g^2*a^3/b^3*ln(1/(d*x+c)*a*d-b*c/(d*x+
c)+b)*f^2-4*B*g^2*a^3/b^3*ln(1/(d*x+c))*f^2+4*B*g/b^2*ln(1/(d*x+c))*a^2*f^3
-4*B*g/b^2*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*f^3-4*B/(a*d-b*c)*ln(1/(d*x+
c)*a*d-b*c/(d*x+c)+b)*a*c*f^4+4/d^2*B*c^2*f^2*g^2*x-2/d*B*g^2*c*f^2*x^2+2*B
*g^3*a^3/b^3*f*x+4*B*g/b*a*f^3*x-2*B/b*ln(1/(d*x+c))*a*f^4+2/5*B*g^4*a^5/b^
5*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)-2/5*B*g^4*a^5/b^5*ln(1/(d*x+c))+1/5*B*g^4
*a^3/b^3*x^2+2/15/d^2*B*g^4*c^2*x^3-1/5/d^3*B*g^4*c^3*x^2+2/5/d^4*B*g^4*c^4
*x-1/10/d*B*g^4*c*x^4+2*B*g^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f^2
*x^3-2/5*B*g^4*a^4/b^4*x+1/10*B*g^4*a/b*x^4-2/15*B*g^4*a^2/b^2*x^3+2*B*g*ln
(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f^3*x^2+1/5/d^5*B*ln(e*(1/(d*x+c)*a
*d-b*c/(d*x+c)+b)^2/d^2)*c^5*g^4-1/d^4*B*g^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)^2/d^2)*f*c^4-2/d^2*B*g*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f^3*c
^2+8/d^3*B*g^2*c^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*f^2-4/d^2*B*g*ln(1/(d*x+
c)*a*d-b*c/(d*x+c)+b)*c^2*f^3-4/d^2*B*ln(1/(d*x+c))*c^2*f^3*g-6/d^4*B*g^3*c
^4*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*f-1/5/d^2*B*g^4*a^3/b^3*c^2+B*g^3*ln(e*(
1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f*x^4-1/10/d^4*B*g^4*a/b*c^4-1/d^4*A*c^
4*f*g^3+2/d^3*A*c^3*f^2*g^2-2/d^2*A*c^2*f^3*g+6/d^3*B*g^2*c^3*f^2-4/d^2*B*g
*c^2*f^3-11/3/d^4*B*g^3*c^4*f-2*B*g^3*a^4/b^4*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+
b)*f+2*B*g^3*a^4/b^4*ln(1/(d*x+c))*f-4/d*B*c*f^3*g*x-2/3/d*B*g^3*c*f*x^3+1/
d^2*B*g^3*c^2*f*x^2-2/d^3*B*g^3*c^3*f*x+4/d^3*B*g^2*c^3*ln(1/(d*x+c))*f^2+2
/d^3*B*g^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f^2*c^3-2/5/d*B*g^4*a^
4/b^4*c+12/d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^2*f^2*g^2-
8/d^2*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^3*f*g^3+2/5/d^5*B
*g^4*c^5*ln(1/(d*x+c))+8/5/d^5*B*g^4*c^5*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+1/
d*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c*f^4+2/d*B*ln(1/(d*x+c))*c*f
^4+5/6/d^5*B*g^4*c^5+1/5/d^5*A*c^5*g^4+1/d*A*c*f^4+A*x^4*f*g^3+2*A*x^3*f^2*
```

```
g^2+2*A*x^2*f^3*g+1/5*B*g^4*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x^5+B
*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x*f^4+2/d^3*B/b/(a*d-b*c)*ln(1/(
d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^4*g^4-8/d^4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*
c/(d*x+c)+b)*c^5*b*f*g^3-8*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^
2*c*f^3*g+12/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^4*b*f^2*g^2+
16/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c^4*f*g^3+8/d*B*g/b*ln
(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c*f^3+16/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c
/(d*x+c)+b)*a*c^2*f^3*g-12/d^2*B*g^2*a/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^
2*f^2-8/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3*b*f^3*g+8/d^3*B
*g^3*a/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3*f-24/d^2*B/(a*d-b*c)*ln(1/(d*x
+c)*a*d-b*c/(d*x+c)+b)*a*c^3*f^2*g^2+A*x*f^4+1/5*A*x^5*g^4-2/15/d^3*B*g^4*a
^2/b^2*c^3+2/3*B*g^3*a/b*f*x^3-B*g^3*a^2/b^2*f*x^2+2*B*g^2*a/b*f^2*x^2-4*B*
g^2*a^2/b^2*f^2*x+2/d^5*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^6*b*g
^4-2/d^4*B*g^4*a/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^4+2*d*B/b/(a*d-b*c)*ln
(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*f^4-4/d^4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*
c/(d*x+c)+b)*a*c^5*g^4+2/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2*
b*f^4+2/d*B*g^3*a^3/b^3*f*c+4/d*B*g/b*a*f^3*c-4/d*B*g^2*a^2/b^2*f^2*c+1/d^2
*B*g^3*a^2/b^2*c^2*f+2/3/d^3*B*g^3*a/b*c^3*f-2/d^2*B*g^2*a/b*c^2*f^2
```

<u>Maxima</u> [B] time = 1.42897, size = 1154, normalized size = 3.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/5*A*g^4*x^5 + A*f*g^3*x^4 + 2*A*f^2*g^2*x^3 + 2*A*f^3*g*x^2 + (x*log(b^2*
e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2
*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*
f^4 + 2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 +
 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2
 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*f^3*g + 2*(x^3*log(b^2
*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^
2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c
)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f^
2*g^2 + 1/3*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2
*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x +
a)/b^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c
^2*d - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*f*g^3 + 1/30*
(6*x^5*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d
*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 12*a^5*log(b*x + a)/b^5 - 12
```

```
*c^5*log(d*x + c)/d^5 - (3*(b^4*c*d^3 - a*b^3*d^4)*x^4 - 4*(b^4*c^2*d^2 - a
^2*b^2*d^4)*x^3 + 6*(b^4*c^3*d - a^3*b*d^4)*x^2 - 12*(b^4*c^4 - a^4*d^4)*x)
/(b^4*d^4))*B*g^4 + A*f^4*x
```

Fricas [A] time = 3.49111, size = 1328, normalized size = 3.72

$$\frac{6\,Ab^5d^5g^4x^5 + 3\left(10\,Ab^5d^5fg^3 - \left(Bb^5cd^4 - Bab^4d^5\right)g^4\right)x^4 + 4\left(15\,Ab^5d^5f^2g^2 - 5\left(Bb^5cd^4 - Bab^4d^5\right)fg^3 + \left(Bb^5c^2d^3 - B\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/30*(6*A*b^5*d^5*g^4*x^5 + 3*(10*A*b^5*d^5*f*g^3 - (B*b^5*c*d^4 - B*a*b^4*
d^5)*g^4)*x^4 + 4*(15*A*b^5*d^5*f^2*g^2 - 5*(B*b^5*c*d^4 - B*a*b^4*d^5)*f*g
^3 + (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*g^4)*x^3 + 6*(10*A*b^5*d^5*f^3*g - 10*
(B*b^5*c*d^4 - B*a*b^4*d^5)*f^2*g^2 + 5*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f*g
^3 - (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g^4)*x^2 + 6*(5*A*b^5*d^5*f^4 - 20*(B*
b^5*c*d^4 - B*a*b^4*d^5)*f^3*g + 20*(B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*f^2*g^2
 - 10*(B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*f*g^3 + 2*(B*b^5*c^4*d - B*a^4*b*d^5)
*g^4)*x + 12*(5*B*a*b^4*d^5*f^4 - 10*B*a^2*b^3*d^5*f^3*g + 10*B*a^3*b^2*d^5
*f^2*g^2 - 5*B*a^4*b*d^5*f*g^3 + B*a^5*d^5*g^4)*log(b*x + a) - 12*(5*B*b^5*
c*d^4*f^4 - 10*B*b^5*c^2*d^3*f^3*g + 10*B*b^5*c^3*d^2*f^2*g^2 - 5*B*b^5*c^4
*d*f*g^3 + B*b^5*c^5*g^4)*log(d*x + c) + 6*(B*b^5*d^5*g^4*x^5 + 5*B*b^5*d^5
*f*g^3*x^4 + 10*B*b^5*d^5*f^2*g^2*x^3 + 10*B*b^5*d^5*f^3*g*x^2 + 5*B*b^5*d^
5*f^4*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b
^5*d^5)
```

Sympy [B] time = 35.7938, size = 1562, normalized size = 4.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**4*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g**4*x**5/5 + 2*B*a*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g**2
 - 10*a*b**3*f**3*g + 5*b**4*f**4)*log(x + (2*B*a**5*c*d**4*g**4 - 10*B*a**
4*b*c*d**4*f*g**3 + 20*B*a**3*b**2*c*d**4*f**2*g**2 - 20*B*a**2*b**3*c*d**4
```

```
*f**3*g + 2*B*a**2*d**5*(a**4*g**4 - 5*a**3*b*f*g**3 + 10*a**2*b**2*f**2*g*
*2 - 10*a*b**3*f**3*g + 5*b**4*f**4)/b + 2*B*a*b**4*c**5*g**4 - 10*B*a*b**4
*c**4*d*f*g**3 + 20*B*a*b**4*c**3*d**2*f**2*g**2 - 20*B*a*b**4*c**2*d**3*f*
*3*g + 20*B*a*b**4*c*d**4*f**4 - 2*B*a*c*d**4*(a**4*g**4 - 5*a**3*b*f*g**3
+ 10*a**2*b**2*f**2*g**2 - 10*a*b**3*f**3*g + 5*b**4*f**4))/(2*B*a**5*d**5*
g**4 - 10*B*a**4*b*d**5*f*g**3 + 20*B*a**3*b**2*d**5*f**2*g**2 - 20*B*a**2*
b**3*d**5*f**3*g + 10*B*a*b**4*d**5*f**4 + 2*B*b**5*c**5*g**4 - 10*B*b**5*c
**4*d*f*g**3 + 20*B*b**5*c**3*d**2*f**2*g**2 - 20*B*b**5*c**2*d**3*f**3*g +
 10*B*b**5*c*d**4*f**4))/(5*b**5) - 2*B*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10
*c**2*d**2*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4)*log(x + (2*B*a**5*c*
d**4*g**4 - 10*B*a**4*b*c*d**4*f*g**3 + 20*B*a**3*b**2*c*d**4*f**2*g**2 - 2
0*B*a**2*b**3*c*d**4*f**3*g + 2*B*a*b**4*c**5*g**4 - 10*B*a*b**4*c**4*d*f*g
**3 + 20*B*a*b**4*c**3*d**2*f**2*g**2 - 20*B*a*b**4*c**2*d**3*f**3*g + 20*B
*a*b**4*c*d**4*f**4 - 2*B*a*b**4*c*(c**4*g**4 - 5*c**3*d*f*g**3 + 10*c**2*d
**2*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4) + 2*B*b**5*c**2*(c**4*g**4
- 5*c**3*d*f*g**3 + 10*c**2*d**2*f**2*g**2 - 10*c*d**3*f**3*g + 5*d**4*f**4
)/d)/(2*B*a**5*d**5*g**4 - 10*B*a**4*b*d**5*f*g**3 + 20*B*a**3*b**2*d**5*f*
*2*g**2 - 20*B*a**2*b**3*d**5*f**3*g + 10*B*a*b**4*d**5*f**4 + 2*B*b**5*c**
5*g**4 - 10*B*b**5*c**4*d*f*g**3 + 20*B*b**5*c**3*d**2*f**2*g**2 - 20*B*b**
5*c**2*d**3*f**3*g + 10*B*b**5*c*d**4*f**4))/(5*d**5) + (B*f**4*x + 2*B*f**
3*g*x**2 + 2*B*f**2*g**2*x**3 + B*f*g**3*x**4 + B*g**4*x**5/5)*log(e*(a + b
*x)**2/(c + d*x)**2) + x**4*(10*A*b*d*f*g**3 + B*a*d*g**4 - B*b*c*g**4)/(10
*b*d) - x**3*(-30*A*b**2*d**2*f**2*g**2 + 2*B*a**2*d**2*g**4 - 10*B*a*b*d**
2*f*g**3 - 2*B*b**2*c**2*g**4 + 10*B*b**2*c*d*f*g**3)/(15*b**2*d**2) + x**2
*(10*A*b**3*d**3*f**3*g + B*a**3*d**3*g**4 - 5*B*a**2*b*d**3*f*g**3 + 10*B*
a*b**2*d**3*f**2*g**2 - B*b**3*c**3*g**4 + 5*B*b**3*c**2*d*f*g**3 - 10*B*b*
*3*c*d**2*f**2*g**2)/(5*b**3*d**3) - x*(-5*A*b**4*d**4*f**4 + 2*B*a**4*d**4
*g**4 - 10*B*a**3*b*d**4*f*g**3 + 20*B*a**2*b**2*d**4*f**2*g**2 - 20*B*a*b*
*3*d**4*f**3*g - 2*B*b**4*c**4*g**4 + 10*B*b**4*c**3*d*f*g**3 - 20*B*b**4*c
**2*d**2*f**2*g**2 + 20*B*b**4*c*d**3*f**3*g)/(5*b**4*d**4)
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^4*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")

[Out] Timed out
```

3.263 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right) dx$

Optimal. Leaf size=229

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{2b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4g}-\frac{Bg^2x^2(bc-$$

```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*x)/(2*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g -
 a*d*g)*x^2)/(4*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3)/(6*b*d) - (B*(b*f - a*g)
^4*Log[a + b*x])/(2*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(4*g) + (B*(d*f - c*g)^4*Log[c + d*x])/(2*d^4*g)
```

Rubi [A] time = 0.323511, antiderivative size = 229, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$-\frac{Bgx(bc-ad)\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)}{2b^3d^3}+\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{4g}-\frac{Bg^2x^2(bc-$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```


```
[Out] -(B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4
*c*d*f*g + c^2*g^2))*x)/(2*b^3*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g -
 a*d*g)*x^2)/(4*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3)/(6*b*d) - (B*(b*f - a*g)
^4*Log[a + b*x])/(2*b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(4*g) + (B*(d*f - c*g)^4*Log[c + d*x])/(2*d^4*g)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4g} - \frac{B\int \frac{2(bc-ad)(f+gx)^4}{(a+bx)(c+dx)}\,dx}{4g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4g} - \frac{(B(bc-ad))\int \frac{(f+gx)^4}{(a+bx)(c+dx)}\,dx}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{4g} - \frac{(B(bc-ad))\int \left(\frac{g^2\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f\right.\right.}{b^3d^3}\right.}{}$$

$$= -\frac{B(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{2b^3d^3} - \frac{B(}{}$$

Mathematica [A] time = 0.257244, size = 217, normalized size = 0.95

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right) - \frac{B\left(6bdg^2x(bc-ad)\left(a^2d^2g^2+abdg(cg-4df)+b^2\left(c^2g^2-4cdfg+6d^2f^2\right)\right)+3b^2d^2g^3x^2(bc-ad)(-adg-bcg+4bdf)+2b^3d^3g^4x\right.}{3b^4d^4}}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - (B*(6*b*d*(b*c - a*
d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g +
 c^2*g^2))*x + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2 + 2*
b^3*d^3*(b*c - a*d)*g^4*x^3 + 6*d^4*(b*f - a*g)^4*Log[a + b*x] - 6*b^4*(d*f
 - c*g)^4*Log[c + d*x]))/(3*b^4*d^4))/(4*g)
```

Maple [B] time = 0.266, size = 1783, normalized size = 7.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] A*x^3*f*g^2+3/2*A*x^2*f^2*g-1/4/d^4*A*c^4*g^3+1/d*A*c*f^3-11/12/d^4*B*g^3*c
^4+1/4*B*g^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x^4+B*ln(e*(1/(d*x+c
)*a*d-b*c/(d*x+c)+b)^2/d^2)*x*f^3-3/d^2*B*g*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)
*c^2*f^2-3/d^2*B*ln(1/(d*x+c))*c^2*f^2*g+4/d^3*B*g^2*c^3*ln(1/(d*x+c)*a*d-b
*c/(d*x+c)+b)*f+1/d^3*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c^3*f*g^2
+2*B*g^2*a^3/b^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*f-4*B/(a*d-b*c)*ln(1/(d*x+
c)*a*d-b*c/(d*x+c)+b)*a*c*f^3+3*B*g/b^2*ln(1/(d*x+c))*a^2*f^2-3*B*g/b^2*ln(
1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*f^2-2*B*g^2*a^3/b^3*ln(1/(d*x+c))*f+2/d^2*
B*g^2*c^2*f*x+2/d^3*B*g^2*c^3*ln(1/(d*x+c))*f-1/2/d^3*B*g^3*c^3*x+1/4/d^2*B
*g^3*c^2*x^2+1/2*B*g^3*a^4/b^4*ln(1/(d*x+c))-1/2*B*g^3*a^4/b^4*ln(1/(d*x+c)
*a*d-b*c/(d*x+c)+b)-2*B/b*ln(1/(d*x+c))*a*f^3+1/d*B*ln(e*(1/(d*x+c)*a*d-b*c
/(d*x+c)+b)^2/d^2)*c*f^3+2/d*B*ln(1/(d*x+c))*c*f^3-1/4/d^4*B*g^3*ln(e*(1/(d
*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c^4-1/2/d^4*B*g^3*c^4*ln(1/(d*x+c))-3/2/d^4
*B*g^3*c^4*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+B*g^2*ln(e*(1/(d*x+c)*a*d-b*c/(d
*x+c)+b)^2/d^2)*f*x^3+3/2*B*g*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f^2
*x^2+1/6*B*g^3*a/b*x^3-1/4*B*g^3*a^2/b^2*x^2+1/2*B*g^3*a^3/b^3*x-1/6/d*B*g^
3*c*x^3-1/d*B*g^2*c*f*x^2-2*B*g^2*a^2/b^2*f*x+6/d*B/b/(a*d-b*c)*ln(1/(d*x+c
)*a*d-b*c/(d*x+c)+b)*a^2*c^2*f*g^2+1/d^3*A*c^3*f*g^2-3/2/d^2*A*c^2*f^2*g+3/
d^3*B*g^2*c^3*f-3/d^2*B*g*c^2*f^2-3/2/d^2*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)
+b)^2/d^2)*c^2*f^2*g-3/d*B*g*c*f^2*x+3*B*g/b*a*f^2*x+B*g^2*a/b*f*x^2+1/4*A*
x^4*g^3+A*x*f^3+12/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c^2*f^2*
g+6/d*B*g/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c*f^2+6/d^3*B/(a*d-b*c)*ln(1/
(d*x+c)*a*d-b*c/(d*x+c)+b)*c^4*b*f*g^2-6/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b
*c/(d*x+c)+b)*c^3*b*f^2*g-12/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b
)*a*c^3*f*g^2-2/d^2*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^3*g
^3-6/d^2*B*g^2*a/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2*f-6*B/b/(a*d-b*c)*ln
(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c*f^2*g+1/6/d^3*B*g^3*a/b*c^3+1/4/d^2*B*g
^3*a^2/b^2*c^2+1/2/d*B*g^3*a^3/b^3*c+3/d*B*g/b*a*f^2*c-2/d*B*g^2*a^2/b^2*f*
c+2/d^3*B*g^3*a/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3+2*d*B/b/(a*d-b*c)*ln(
1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*f^3+2/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(
d*x+c)+b)*c^2*b*f^3-2/d^4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^5*b
*g^3+4/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c^4*g^3-1/d^2*B*g^
2*a/b*c^2*f
```

Maxima [B] time = 1.34343, size = 841, normalized size = 3.67

$$\frac{1}{4}Ag^3x^4 + Afg^2x^3 + \frac{3}{2}Af^2gx^2 + \left(x\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2} + \frac{2\,abex}{d^2x^2+2\,cdx+c^2} + \frac{a^2e}{d^2x^2+2\,cdx+c^2}\right) + \frac{2\,a\log(bx+a)}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/4*A*g^3*x^4 + A*f*g^2*x^3 + 3/2*A*f^2*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 +
 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*
c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*f^3 + 3/2*(x^2*l
og(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2
) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d
*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*B*f^2*g + (x^3*log(b^2*e*x^2/(d^2*x^2
+ 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2
*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*
d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*f*g^2 + 1/12*(3*x^
4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x +
c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x + a)/b^4 + 6*c^4*lo
g(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d - a^2*b*d^3)
*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*B*g^3 + A*f^3*x
```

Fricas [B] time = 1.91492, size = 938, normalized size = 4.1

$$\frac{3\,Ab^4d^4g^3x^4 + 2\left(6\,Ab^4d^4fg^2 - \left(Bb^4cd^3 - Bab^3d^4\right)g^3\right)x^3 + 3\left(6\,Ab^4d^4f^2g - 4\left(Bb^4cd^3 - Bab^3d^4\right)fg^2 + \left(Bb^4c^2d^2 - Ba^2b^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/12*(3*A*b^4*d^4*g^3*x^4 + 2*(6*A*b^4*d^4*f*g^2 - (B*b^4*c*d^3 - B*a*b^3*d
^4)*g^3)*x^3 + 3*(6*A*b^4*d^4*f^2*g - 4*(B*b^4*c*d^3 - B*a*b^3*d^4)*f*g^2 +
 (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g^3)*x^2 + 6*(2*A*b^4*d^4*f^3 - 6*(B*b^4*c
*d^3 - B*a*b^3*d^4)*f^2*g + 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*f*g^2 - (B*b^
4*c^3*d - B*a^3*b*d^4)*g^3)*x + 6*(4*B*a*b^3*d^4*f^3 - 6*B*a^2*b^2*d^4*f^2*
g + 4*B*a^3*b*d^4*f*g^2 - B*a^4*d^4*g^3)*log(b*x + a) - 6*(4*B*b^4*c*d^3*f^
3 - 6*B*b^4*c^2*d^2*f^2*g + 4*B*b^4*c^3*d*f*g^2 - B*b^4*c^4*g^3)*log(d*x +
```

```
c) + 3*(B*b^4*d^4*g^3*x^4 + 4*B*b^4*d^4*f*g^2*x^3 + 6*B*b^4*d^4*f^2*g*x^2 +
 4*B*b^4*d^4*f^3*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x
+ c^2)))/(b^4*d^4)
```

Sympy [B] time = 18.9458, size = 1052, normalized size = 4.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g**3*x**4/4 - B*a*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)*log
(x + (B*a**4*c*d**3*g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*
f**2*g + B*a**2*d**4*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f*g + 2*b**2*f**2)/b
+ B*a*b**3*c**4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2
*g - 8*B*a*b**3*c*d**3*f**3 - B*a*c*d**3*(a*g - 2*b*f)*(a**2*g**2 - 2*a*b*f
*g + 2*b**2*f**2))/(B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b*
*2*d**4*f**2*g - 4*B*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*
f*g**2 + 6*B*b**4*c**2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(2*b**4) + B*c*
(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)*log(x + (B*a**4*c*d**3*
g**3 - 4*B*a**3*b*c*d**3*f*g**2 + 6*B*a**2*b**2*c*d**3*f**2*g + B*a*b**3*c*
*4*g**3 - 4*B*a*b**3*c**3*d*f*g**2 + 6*B*a*b**3*c**2*d**2*f**2*g - 8*B*a*b*
*3*c*d**3*f**3 - B*a*b**3*c*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f
**2) + B*b**4*c**2*(c*g - 2*d*f)*(c**2*g**2 - 2*c*d*f*g + 2*d**2*f**2)/d)/(
B*a**4*d**4*g**3 - 4*B*a**3*b*d**4*f*g**2 + 6*B*a**2*b**2*d**4*f**2*g - 4*B
*a*b**3*d**4*f**3 + B*b**4*c**4*g**3 - 4*B*b**4*c**3*d*f*g**2 + 6*B*b**4*c*
*2*d**2*f**2*g - 4*B*b**4*c*d**3*f**3))/(2*d**4) + (B*f**3*x + 3*B*f**2*g*x
**2/2 + B*f*g**2*x**3 + B*g**3*x**4/4)*log(e*(a + b*x)**2/(c + d*x)**2) + x
**3*(6*A*b*d*f*g**2 + B*a*d*g**3 - B*b*c*g**3)/(6*b*d) - x**2*(-6*A*b**2*d*
*2*f**2*g + B*a**2*d**2*g**3 - 4*B*a*b*d**2*f*g**2 - B*b**2*c**2*g**3 + 4*B
*b**2*c*d*f*g**2)/(4*b**2*d**2) + x*(2*A*b**3*d**3*f**3 + B*a**3*d**3*g**3
- 4*B*a**2*b*d**3*f*g**2 + 6*B*a*b**2*d**3*f**2*g - B*b**3*c**3*g**3 + 4*B*
b**3*c**2*d*f*g**2 - 6*B*b**3*c*d**2*f**2*g)/(2*b**3*d**3)
```

Giac [B] time = 137.852, size = 603, normalized size = 2.63

$$\frac{1}{4}\left(Ag^3 + Bg^3\right)x^4 + \frac{\left(6\,Abdfg^2 + 6\,Bbdfg^2 - Bbcg^3 + Badg^3\right)x^3}{6\,bd} + \frac{1}{4}\left(Bg^3x^4 + 4\,Bfg^2x^3 + 6\,Bf^2gx^2 + 4\,Bf^3x\right)\log\left(\frac{b^2x}{d^2x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] 1/4*(A*g^3 + B*g^3)*x^4 + 1/6*(6*A*b*d*f*g^2 + 6*B*b*d*f*g^2 - B*b*c*g^3 +
B*a*d*g^3)*x^3/(b*d) + 1/4*(B*g^3*x^4 + 4*B*f*g^2*x^3 + 6*B*f^2*g*x^2 + 4*B
*f^3*x)*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) + 1/4*(6*A
*b^2*d^2*f^2*g + 6*B*b^2*d^2*f^2*g - 4*B*b^2*c*d*f*g^2 + 4*B*a*b*d^2*f*g^2
+ B*b^2*c^2*g^3 - B*a^2*d^2*g^3)*x^2/(b^2*d^2) + 1/2*(4*B*a*b^3*f^3 - 6*B*a
^2*b^2*f^2*g + 4*B*a^3*b*f*g^2 - B*a^4*g^3)*log(b*x + a)/b^4 - 1/2*(4*B*c*d
^3*f^3 - 6*B*c^2*d^2*f^2*g + 4*B*c^3*d*f*g^2 - B*c^4*g^3)*log(-d*x - c)/d^4
 + 1/2*(2*A*b^3*d^3*f^3 + 2*B*b^3*d^3*f^3 - 6*B*b^3*c*d^2*f^2*g + 6*B*a*b^2
*d^3*f^2*g + 4*B*b^3*c^2*d*f*g^2 - 4*B*a^2*b*d^3*f*g^2 - B*b^3*c^3*g^3 + B*
a^3*d^3*g^3)*x/(b^3*d^3)
```

3.264 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=152

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3g}-\frac{2Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{2B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2x^2(bc-ad)}{3bd}+$$

```
[Out] (-2*B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*g^2*x^2)/(3*b*d) - (2*B*(b*f - a*g)^3*Log[a + b*x])/(3*b^3*g) + ((f + g*
x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*g) + (2*B*(d*f - c*g)^3*L
og[c + d*x])/(3*d^3*g)
```

Rubi [A] time = 0.160903, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{3g}-\frac{2Bgx(bc-ad)(-adg-bcg+3bdf)}{3b^2d^2}-\frac{2B(bf-ag)^3\log(a+bx)}{3b^3g}-\frac{Bg^2x^2(bc-ad)}{3bd}+$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```


```
[Out] (-2*B*(b*c - a*d)*g*(3*b*d*f - b*c*g - a*d*g)*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*g^2*x^2)/(3*b*d) - (2*B*(b*f - a*g)^3*Log[a + b*x])/(3*b^3*g) + ((f + g*
x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*g) + (2*B*(d*f - c*g)^3*L
og[c + d*x])/(3*d^3*g)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3g}-\frac{B\int\frac{2(bc-ad)(f+gx)^3}{(a+bx)(c+dx)}dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3g}-\frac{(2B(bc-ad))\int\frac{(f+gx)^3}{(a+bx)(c+dx)}dx}{3g}$$

$$=\frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3g}-\frac{(2B(bc-ad))\int\left(\frac{g^2(3bdf-bcg-adg)}{b^2d^2}+\frac{g^3x}{bd}+\frac{}{b^2}\right.}{3g}$$

$$=-\frac{2B(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2}-\frac{B(bc-ad)g^2x^2}{3bd}-\frac{2B(bf-ag)^3\log(a+}{3b^3g}$$

Mathematica [A] time = 0.131152, size = 142, normalized size = 0.93

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)-\frac{B\left(b^2d^2g^3x^2(bc-ad)+2bdg^2x(bc-ad)(-adg-bcg+3bdf)+2d^3(bf-ag)^3\log(a+bx)-2b^3(df-cg)^3\log(c+dx)\right)}{b^3d^3}}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - (B*(2*b*d*(b*c - a*
d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + b^2*d^2*(b*c - a*d)*g^3*x^2 + 2*d^3*(b
*f - a*g)^3*Log[a + b*x] - 2*b^3*(d*f - c*g)^3*Log[c + d*x]))/(b^3*d^3))/(3
*g)
```

Maple [B] time = 0.237, size = 1188, normalized size = 7.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] -2/3/d*B*g^2*a^2/b^2*c-2/d*B*g*c*f*x-1/d^2*B*g*ln(e*(1/(d*x+c)*a*d-b*c/(d*x
+c)+b)^2/d^2)*f*c^2-2/d^2*B*g*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2*f-2*B*g/b
^2*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*f-2/d^2*B*ln(1/(d*x+c))*c^2*f*g-4*B/
(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c*f^2+2*B*g/b^2*ln(1/(d*x+c))*a
^2*f+2*B*g/b*a*f*x+A*x^2*f*g+B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x*
f^2+1/3/d^3*A*c^3*g^2+1/d*A*c*f^2+1/d^3*B*c^3*g^2+1/3*B*g^2*ln(e*(1/(d*x+c)
*a*d-b*c/(d*x+c)+b)^2/d^2)*x^3-2/3*B*g^2*a^3/b^3*ln(1/(d*x+c))+2/3*B*g^2*a^
3/b^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)+B*g*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b
)^2/d^2)*f*x^2+1/d*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c*f^2+2/d*B*
ln(1/(d*x+c))*c*f^2-1/3/d*B*c*g^2*x^2+2/3/d^2*B*c^2*g^2*x+1/3*B*g^2*a/b*x^2
+1/3/d^3*B*g^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c^3+2/3/d^3*B*g^2*
c^3*ln(1/(d*x+c))+4/3/d^3*B*g^2*c^3*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)-2*B/b*l
n(1/(d*x+c))*a*f^2+2/d*B*g/b*a*f*c+1/3*A*x^3*g^2+A*x*f^2+2/d*B/b/(a*d-b*c)*
ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c^2*g^2-4*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*
d-b*c/(d*x+c)+b)*a^2*c*f*g+8/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*
a*c^2*f*g-4/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3*b*f*g+4/d*B
*g/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c*f-2/3*B*g^2*a^2/b^2*x-2/d^2*B*g*c^
2*f-1/d^2*A*c^2*f*g-1/3/d^2*B*g^2*a/b*c^2+2/d^3*B/(a*d-b*c)*ln(1/(d*x+c)*a*
d-b*c/(d*x+c)+b)*c^4*b*g^2+2*d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b
)*a^2*f^2+2/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2*b*f^2-4/d^2*B
/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c^3*g^2-2/d^2*B*g^2*a/b*ln(1/(
d*x+c)*a*d-b*c/(d*x+c)+b)*c^2
```

Maxima [B] time = 1.32247, size = 566, normalized size = 3.72

$$\frac{1}{3}Ag^2x^3 + Afgx^2 + \left(x\log\left(\frac{b^2ex^2}{d^2x^2 + 2cdx + c^2} + \frac{2abex}{d^2x^2 + 2cdx + c^2} + \frac{a^2e}{d^2x^2 + 2cdx + c^2}\right) + \frac{2a\log(bx + a)}{b} - \frac{2c\log(d\dots}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/3*A*g^2*x^3 + A*f*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*
a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*
```

```
log(b*x + a)/b - 2*c*log(d*x + c)/d)*B*f^2 + (x^2*log(b^2*e*x^2/(d^2*x^2 +
2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c
*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a
*d)*x/(b*d))*B*f*g + 1/3*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a
*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3
*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(
b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*B*g^2 + A*f^2*x
```

Fricas [B] time = 1.33308, size = 621, normalized size = 4.09

$$\frac{Ab^3d^3g^2x^3 + \left(3\,Ab^3d^3fg - \left(Bb^3cd^2 - Bab^2d^3\right)g^2\right)x^2 + \left(3\,Ab^3d^3f^2 - 6\left(Bb^3cd^2 - Bab^2d^3\right)fg + 2\left(Bb^3c^2d - Ba^2bd^3\right)g^2\right)x \cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/3*(A*b^3*d^3*g^2*x^3 + (3*A*b^3*d^3*f*g - (B*b^3*c*d^2 - B*a*b^2*d^3)*g^2
)*x^2 + (3*A*b^3*d^3*f^2 - 6*(B*b^3*c*d^2 - B*a*b^2*d^3)*f*g + 2*(B*b^3*c^2
*d - B*a^2*b*d^3)*g^2)*x + 2*(3*B*a*b^2*d^3*f^2 - 3*B*a^2*b*d^3*f*g + B*a^3
*d^3*g^2)*log(b*x + a) - 2*(3*B*b^3*c*d^2*f^2 - 3*B*b^3*c^2*d*f*g + B*b^3*c
^3*g^2)*log(d*x + c) + (B*b^3*d^3*g^2*x^3 + 3*B*b^3*d^3*f*g*x^2 + 3*B*b^3*d
^3*f^2*x)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(
b^3*d^3)
```

Sympy [B] time = 10.3726, size = 719, normalized size = 4.73

$$\frac{Ag^2x^3}{3} + \frac{2Ba\left(a^2g^2 - 3abfg + 3b^2f^2\right)\log\left(x + \frac{2Ba^3cd^2g^2 - 6Ba^2bcd^2fg + \frac{2Ba^2d^3\left(a^2g^2 - 3abfg + 3b^2f^2\right)}{b} + 2Bab^2c^3g^2 - 6Bab^2c^2dfg + 12Bab^2cd^2f^2 - 2Bac \cdots}{2Ba^3d^3g^2 - 6Ba^2bd^3fg + 6Bab^2d^3f^2 + 2Bb^3c^3g^2 - 6Bb^3c^2dfg + 6Bb^3cd^2f^2 \cdots}\right.}{3b^3} \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g**2*x**3/3 + 2*B*a*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2)*log(x + (2*B*a*
*3*c*d**2*g**2 - 6*B*a**2*b*c*d**2*f*g + 2*B*a**2*d**3*(a**2*g**2 - 3*a*b*f
*g + 3*b**2*f**2)/b + 2*B*a*b**2*c**3*g**2 - 6*B*a*b**2*c**2*d*f*g + 12*B*a
```

```
*b**2*c*d**2*f**2 - 2*B*a*c*d**2*(a**2*g**2 - 3*a*b*f*g + 3*b**2*f**2))/(2*
B*a**3*d**3*g**2 - 6*B*a**2*b*d**3*f*g + 6*B*a*b**2*d**3*f**2 + 2*B*b**3*c*
*3*g**2 - 6*B*b**3*c**2*d*f*g + 6*B*b**3*c*d**2*f**2))/(3*b**3) - 2*B*c*(c*
*2*g**2 - 3*c*d*f*g + 3*d**2*f**2)*log(x + (2*B*a**3*c*d**2*g**2 - 6*B*a**2
*b*c*d**2*f*g + 2*B*a*b**2*c**3*g**2 - 6*B*a*b**2*c**2*d*f*g + 12*B*a*b**2*
c*d**2*f**2 - 2*B*a*b**2*c*(c**2*g**2 - 3*c*d*f*g + 3*d**2*f**2) + 2*B*b**3
*c**2*(c**2*g**2 - 3*c*d*f*g + 3*d**2*f**2)/d)/(2*B*a**3*d**3*g**2 - 6*B*a*
*2*b*d**3*f*g + 6*B*a*b**2*d**3*f**2 + 2*B*b**3*c**3*g**2 - 6*B*b**3*c**2*d
*f*g + 6*B*b**3*c*d**2*f**2))/(3*d**3) + (B*f**2*x + B*f*g*x**2 + B*g**2*x*
*3/3)*log(e*(a + b*x)**2/(c + d*x)**2) + x**2*(3*A*b*d*f*g + B*a*d*g**2 - B
*b*c*g**2)/(3*b*d) - x*(-3*A*b**2*d**2*f**2 + 2*B*a**2*d**2*g**2 - 6*B*a*b*
d**2*f*g - 2*B*b**2*c**2*g**2 + 6*B*b**2*c*d*f*g)/(3*b**2*d**2)
```

Giac [A] time = 14.6037, size = 377, normalized size = 2.48

$$\frac{1}{3}\left(Ag^2+Bg^2\right)x^3+\frac{1}{3}\left(Bg^2x^3+3\,Bfgx^2+3\,Bf^2x\right)\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right)+\frac{\left(3\,Abdfg+3\,Bbdfg-Bbcg^2+Badg^2\right)x^2}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] 1/3*(A*g^2 + B*g^2)*x^3 + 1/3*(B*g^2*x^3 + 3*B*f*g*x^2 + 3*B*f^2*x)*log((b^
2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2)) + 1/3*(3*A*b*d*f*g + 3*B*
b*d*f*g - B*b*c*g^2 + B*a*d*g^2)*x^2/(b*d) + 2/3*(3*B*a*b^2*f^2 - 3*B*a^2*b
*f*g + B*a^3*g^2)*log(b*x + a)/b^3 - 2/3*(3*B*c*d^2*f^2 - 3*B*c^2*d*f*g + B
*c^3*g^2)*log(-d*x - c)/d^3 + 1/3*(3*A*b^2*d^2*f^2 + 3*B*b^2*d^2*f^2 - 6*B*
b^2*c*d*f*g + 6*B*a*b*d^2*f*g + 2*B*b^2*c^2*g^2 - 2*B*a^2*d^2*g^2)*x/(b^2*d
^2)
```

3.265 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx$

Optimal. Leaf size=104

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{b^2g}-\frac{Bgx(bc-ad)}{bd}+\frac{B(df-cg)^2\log(c+dx)}{d^2g}$$

```
[Out] -((B*(b*c - a*d)*g*x)/(b*d)) - (B*(b*f - a*g)^2*Log[a + b*x])/(b^2*g) + ((f
 + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*g) + (B*(d*f - c*g)^
2*Log[c + d*x])/(d^2*g)
```

Rubi [A] time = 0.0870162, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2525, 12, 72}

$$\frac{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{2g}-\frac{B(bf-ag)^2\log(a+bx)}{b^2g}-\frac{Bgx(bc-ad)}{bd}+\frac{B(df-cg)^2\log(c+dx)}{d^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] -((B*(b*c - a*d)*g*x)/(b*d)) - (B*(b*f - a*g)^2*Log[a + b*x])/(b^2*g) + ((f
 + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*g) + (B*(d*f - c*g)^
2*Log[c + d*x])/(d^2*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g} - \frac{B\int \frac{2(bc-ad)(f+gx)^2}{(a+bx)(c+dx)}dx}{2g}$$
$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g} - \frac{(B(bc-ad))\int \frac{(f+gx)^2}{(a+bx)(c+dx)}dx}{g}$$
$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g} - \frac{(B(bc-ad))\int \left(\frac{g^2}{bd} + \frac{(bf-ag)^2}{b(bc-ad)(a+bx)} + \frac{(df}{d(-bc+}\right.}{g}$$
$$= -\frac{B(bc-ad)gx}{bd} - \frac{B(bf-ag)^2\log(a+bx)}{b^2g} + \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{2g}$$

Mathematica [A] time = 0.104722, size = 118, normalized size = 1.13

$$\frac{b\left(d\left(2Bg^2x(ad-bc)+Abd(f+gx)^2\right)+bBd^2(f+gx)^2\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+2bB(df-cg)^2\log(c+dx)\right)-2Bd^2(bf-ag)^2\log}{2b^2d^2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] (-2*B*d^2*(b*f - a*g)^2*Log[a + b*x] + b*(d*(2*B*(-(b*c) + a*d)*g^2*x + A*b
*d*(f + g*x)^2) + b*B*d^2*(f + g*x)^2*Log[(e*(a + b*x)^2)/(c + d*x)^2] + 2*
b*B*(d*f - c*g)^2*Log[c + d*x]))/(2*b^2*d^2*g)
```

Maple [B] time = 0.244, size = 656, normalized size = 6.3

$$\frac{Bgac}{bd} - 4\frac{Bacf}{ad-bc}\ln\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right) - \frac{Ac^2g}{2d^2} + \frac{Acf}{d} - \frac{Bc^2g}{d^2} + B\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\right)xf + \frac{Bgx^2}{2}\ln\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] 1/d*B*g/b*a*c-4*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c*f-1/2/d^2*A
*c^2*g+1/d*A*c*f-1/d^2*B*c^2*g+B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*
x*f+1/2*B*g*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x^2-2*B/b*ln(1/(d*x+c
))*a*f+1/d*B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c*f+2/d*B*ln(1/(d*x+
c))*c*f-1/d^2*B*g*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2-1/2/d^2*B*ln(e*(1/(d*
x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c^2*g-1/d^2*B*ln(1/(d*x+c))*c^2*g-1/d*B*c*g*
x+2/d*B*g/b*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a*c+2/d*B/(a*d-b*c)*ln(1/(d*x+c
)*a*d-b*c/(d*x+c)+b)*c^2*b*f+4/d*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b
)*a*c^2*g+2*d*B/b/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*f+B*g/b*a*x
-2/d^2*B/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^3*b*g-2*B/b/(a*d-b*c)*
ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2*c*g-B*g/b^2*ln(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)*a^2+B*g/b^2*ln(1/(d*x+c))*a^2+1/2*A*x^2*g+A*f*x
```

Maxima [B] time = 1.16359, size = 332, normalized size = 3.19

$$\frac{1}{2}\,Agx^2+\left(x\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)+\frac{2\,a\log\left(bx+a\right)}{b}-\frac{2\,c\log\left(dx+c\right)}{d}\right)Bf+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] 1/2*A*g*x^2 + (x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x
^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b
 - 2*c*log(d*x + c)/d)*B*f + 1/2*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^
2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))
 - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))
*B*g + A*f*x
```

Fricas [A] time = 1.04507, size = 373, normalized size = 3.59

$$\frac{Ab^2d^2gx^2+2\left(Ab^2d^2f-\left(Bb^2cd-Babd^2\right)g\right)x+2\left(2\,Babd^2f-Ba^2d^2g\right)\log\left(bx+a\right)-2\left(2\,Bb^2cdf-Bb^2c^2g\right)\log\left(dx+c\right)}{2\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*g*x^2 + 2*(A*b^2*d^2*f - (B*b^2*c*d - B*a*b*d^2)*g)*x + 2*(2
*B*a*b*d^2*f - B*a^2*d^2*g)*log(b*x + a) - 2*(2*B*b^2*c*d*f - B*b^2*c^2*g)*
log(d*x + c) + (B*b^2*d^2*g*x^2 + 2*B*b^2*d^2*f*x)*log((b^2*e*x^2 + 2*a*b*e
*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b^2*d^2)
```

Sympy [B] time = 4.26136, size = 321, normalized size = 3.09

$$\frac{Agx^2}{2} - \frac{Ba\left(ag-2bf\right)\log\left(x+\frac{Ba^2cdg+\frac{Ba^2d^2(ag-2bf)}{b}+Babc^2g-4Babcdf-Bacd(ag-2bf)}{Ba^2d^2g-2Babd^2f+Bb^2c^2g-2Bb^2cdf}\right)}{b^2} + \frac{Bc\left(cg-2df\right)\log\left(x+\frac{Ba^2cdg+Babc^2g-4Bab}{Ba^2d^2g-2B}\right.}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] A*g*x**2/2 - B*a*(a*g - 2*b*f)*log(x + (B*a**2*c*d*g + B*a**2*d**2*(a*g - 2
*b*f)/b + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*c*d*(a*g - 2*b*f))/(B*a**2*d**
2*g - 2*B*a*b*d**2*f + B*b**2*c**2*g - 2*B*b**2*c*d*f))/b**2 + B*c*(c*g - 2
*d*f)*log(x + (B*a**2*c*d*g + B*a*b*c**2*g - 4*B*a*b*c*d*f - B*a*b*c*(c*g -
 2*d*f) + B*b**2*c**2*(c*g - 2*d*f)/d)/(B*a**2*d**2*g - 2*B*a*b*d**2*f + B*
b**2*c**2*g - 2*B*b**2*c*d*f))/d**2 + (B*f*x + B*g*x**2/2)*log(e*(a + b*x)*
*2/(c + d*x)**2) + x*(A*b*d*f + B*a*d*g - B*b*c*g)/(b*d)
```

Giac [A] time = 2.10539, size = 196, normalized size = 1.88

$$\frac{1}{2}\left(Ag+Bg\right)x^2 + \frac{1}{2}\left(Bgx^2+2\,Bfx\right)\log\left(\frac{b^2x^2+2\,abx+a^2}{d^2x^2+2\,cdx+c^2}\right) + \frac{\left(Abdf+Bbdf-Bbcg+Badg\right)x}{bd} + \frac{\left(2\,Babf-Ba^2g\right)\log}{b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] 1/2*(A*g + B*g)*x^2 + 1/2*(B*g*x^2 + 2*B*f*x)*log((b^2*x^2 + 2*a*b*x + a^2)
/(d^2*x^2 + 2*c*d*x + c^2)) + (A*b*d*f + B*b*d*f - B*b*c*g + B*a*d*g)*x/(b*
d) + (2*B*a*b*f - B*a^2*g)*log(b*x + a)/b^2 - (2*B*c*d*f - B*c^2*g)*log(-d*
x - c)/d^2
```

3.266 $\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\,dx$

Optimal. Leaf size=54

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/b - (2*B*(b*c - a*d)*L
og[c + d*x])/(b*d)
```

Rubi [A] time = 0.0271851, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/b - (2*B*(b*c - a*d)*L
og[c + d*x])/(b*d)
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)dx = Ax+B\int \log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)dx$$
$$= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{(2B(bc-ad))\int \frac{1}{c+dx}dx}{b}$$
$$= Ax+\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}$$

Mathematica [A] time = 0.0232233, size = 54, normalized size = 1.

$$\frac{B(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b}-\frac{2B(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2],x]
```

```
[Out] A*x + (B*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/b - (2*B*(b*c - a*d)*L
og[c + d*x])/(b*d)
```

Maple [B] time = 0.224, size = 233, normalized size = 4.3

$$Ax+B\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\right)x+\frac{Bc}{d}\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\right)-2\frac{B\ln\left((dx+c)^{-1}\right)a}{b}+2\frac{B\ln\left((dx+c\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A+B*ln(e*(b*x+a)^2/(d*x+c)^2),x)
```

```
[Out] A*x+B*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*x+B/d*ln(e*(1/(d*x+c)*a*d-b
*c/(d*x+c)+b)^2/d^2)*c-2*B/b*ln(1/(d*x+c))*a+2*B/d*ln(1/(d*x+c))*c+2*B*d/b/
(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*a^2-4*B/(a*d-b*c)*ln(1/(d*x+c)*a*
d-b*c/(d*x+c)+b)*a*c+2*B/d/(a*d-b*c)*ln(1/(d*x+c)*a*d-b*c/(d*x+c)+b)*c^2*b
```

Maxima [A] time = 1.23, size = 77, normalized size = 1.43

$$\left(x\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+\frac{2\left(\frac{ae\log(bx+a)}{b}-\frac{ce\log(dx+c)}{d}\right)}{e}\right)B+Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^2/(d*x+c)^2),x, algorithm="maxima")
```

```
[Out] (x*log((b*x + a)^2*e/(d*x + c)^2) + 2*(a*e*log(b*x + a)/b - c*e*log(d*x + c
)/d)/e)*B + A*x
```

Fricas [A] time = 1.01892, size = 184, normalized size = 3.41

$$\frac{Bbdx\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+Abdx+2\,Bad\log\left(bx+a\right)-2\,Bbc\log\left(dx+c\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^2/(d*x+c)^2),x, algorithm="fricas")
```

```
[Out] (B*b*d*x*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) + A
*b*d*x + 2*B*a*d*log(b*x + a) - 2*B*b*c*log(d*x + c))/(b*d)
```

Sympy [B] time = 1.14493, size = 104, normalized size = 1.93

$$Ax+\frac{2Ba\log\left(x+\frac{\frac{2Ba^2d}{b}+2Bac}{2Bad+2Bbc}\right)}{b}-\frac{2Bc\log\left(x+\frac{2Bac+\frac{2Bbc^2}{d}}{2Bad+2Bbc}\right)}{d}+Bx\log\left(\frac{e\left(a+bx\right)^2}{\left(c+dx\right)^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*(b*x+a)**2/(d*x+c)**2),x)
```

```
[Out] A*x + 2*B*a*log(x + (2*B*a**2*d/b + 2*B*a*c)/(2*B*a*d + 2*B*b*c))/b - 2*B*c
*log(x + (2*B*a*c + 2*B*b*c**2/d)/(2*B*a*d + 2*B*b*c))/d + B*x*log(e*(a + b
```

```
*x)**2/(c + d*x)**2)
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^2/(d*x+c)^2),x, algorithm="giac")

[Out] Exception raised: NotImplementedError
```

3.267 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{f+gx}\,dx$

Optimal. Leaf size=144

$$-\frac{2B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{2B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}-\frac{2B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}$$

```
[Out] (-2*B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g + ((A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/g + (2*B*Log[-((g*(c + d*x))/(d*f -
c*g))]*Log[f + g*x])/g - (2*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2
*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Rubi [A] time = 0.308878, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.207, Rules used = {2524, 12, 2418, 2394, 2393, 2391}

$$-\frac{2B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{g}+\frac{2B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)}{g}+\frac{\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}-\frac{2B\log(f+gx)\log\left(-\frac{g(a+bx)}{bf-ag}\right)}{g}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x),x]
```



```
[Out] (-2*B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g + ((A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/g + (2*B*Log[-((g*(c + d*x))/(d*f -
c*g))]*Log[f + g*x])/g - (2*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (2
*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```


Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{f+gx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} - \frac{B\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(f+gx)}{e(a+bx)^2}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} - \frac{B\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\log(f+gx)}{(a+bx)^2}\,dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} - \frac{B\int \left(\frac{2be\log(f+gx)}{a+bx}-\frac{2de\log(f+gx)}{c+dx}\right)dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} - \frac{(2bB)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} + \frac{(2Bd)\int \frac{\log(f+gx)}{c+dx}\,dx}{g}$$

$$= -\frac{2B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} + \frac{2B\log\left(-\frac{g(c+dx)}{df-cg}\right)\log}{g}$$

$$= -\frac{2B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} + \frac{2B\log\left(-\frac{g(c+dx)}{df-cg}\right)\log}{g}$$

$$= -\frac{2B\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{g} + \frac{2B\log\left(-\frac{g(c+dx)}{df-cg}\right)\log}{g}$$

Mathematica [A] time = 0.0591387, size = 119, normalized size = 0.83

$$\frac{-2B\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)+2B\text{PolyLog}\left(2,\frac{d(f+gx)}{df-cg}\right)+\log(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)-2B\log\left(\frac{g(a+bx)}{ag-bf}\right)+A+2B\log\left(\frac{g(c+d}{cg-d}\right.\right.}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x),x]
```

```
[Out] ((A - 2*B*Log[(g*(a + b*x))/(-(b*f) + a*g)] + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2] + 2*B*Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] - 2*B*PolyLog[2
, (b*(f + g*x))/(b*f - a*g)] + 2*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g
```

Maple [B] time = 0.445, size = 1143, normalized size = 7.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x)
```

```
[Out] -A/g*ln(1/(d*x+c))+A/g*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)-B/g*ln(1/(d*x+c))*ln
(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+2*d*B/g*dilog((1/(d*x+c)*(a*d-b*c)+
b)/b)/(a*d-b*c)*a-2*B/g*dilog((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*b*c+2*d*
B/g*ln(1/(d*x+c))*ln((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*a-2*B/g*ln(1/(d*x
+c))*ln((1/(d*x+c)*(a*d-b*c)+b)/b)/(a*d-b*c)*b*c+B*ln((c*g-d*f)/(d*x+c)-g)/
(c*g-d*f)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c-d*B/g*ln((c*g-d*f)/(d
*x+c)-g)/(c*g-d*f)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f-2*d*B/(c*g-d
*f)*dilog((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d
-b*c)*a*c+2*d^2*B/g/(c*g-d*f)*dilog((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-
b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*a*f+2*B/(c*g-d*f)*dilog((((c*g-d*f)/(d*x+c)
-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*b*c^2-2*d*B/g/(c*g-d*f)
*dilog((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*
c)*b*c*f-2*d*B/(c*g-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f)/(d*x+c)-g)*
(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*a*c+2*d^2*B/g/(c*g-d*f)*ln(
(c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*
g-b*d*f))/(a*d-b*c)*a*f+2*B/(c*g-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f
)/(d*x+c)-g)*(a*d-b*c)+a*d*g-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*b*c^2-2*d*B/g/
(c*g-d*f)*ln((c*g-d*f)/(d*x+c)-g)*ln((((c*g-d*f)/(d*x+c)-g)*(a*d-b*c)+a*d*g
-b*d*f)/(a*d*g-b*d*f))/(a*d-b*c)*b*c*f
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B\int -\frac{2\,\log\left(bx+a\right)-2\,\log\left(dx+c\right)+\log\left(e\right)}{gx+f}\,dx+\frac{A\log\left(gx+f\right)}{g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(2*log(b*x + a) - 2*log(d*x + c) + log(e))/(g*x + f), x) + A*
log(g*x + f)/g
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A)/(g*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)/(g*x + f), x)
```

3.268 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^2}\,dx$

Optimal. Leaf size=90

$$\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{(f+gx)(bf-ag)}+\frac{2B(bc-ad)\log\left(\frac{f+gx}{c+dx}\right)}{(bf-ag)(df-cg)}$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*f - a*g)*(f + g*x)
) + (2*B*(b*c - a*d)*Log[(f + g*x)/(c + d*x)])/((b*f - a*g)*(d*f - c*g))
```

Rubi [A] time = 0.092491, antiderivative size = 117, normalized size of antiderivative = 1.3, number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{g(f+gx)}+\frac{2B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}+\frac{2bB\log(a+bx)}{g(bf-ag)}-\frac{2Bd\log(c+dx)}{g(df-cg)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^2,x]
```

```
[Out] (2*b*B*Log[a + b*x])/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)
^2])/(g*(f + g*x)) - (2*B*d*Log[c + d*x])/(g*(d*f - c*g)) + (2*B*(b*c - a*d
)*Log[f + g*x])/((b*f - a*g)*(d*f - c*g))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^2}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)} + \frac{B\int \frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)} + \frac{(2B(bc-ad))\int \frac{1}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)} + \frac{(2B(bc-ad))\int \left(\frac{b^2}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2}{(bc-ad)(-df+cg)(c+dx)} + \frac{g^{}}{(bf-ag)(df-}\right.}{g}$$

$$= \frac{2bB\log(a+bx)}{g(bf-ag)} - \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{g(f+gx)} - \frac{2Bd\log(c+dx)}{g(df-cg)} + \frac{2B(bc-ad)\log(f+gx)}{(bf-ag)(df-cg)}$$

Mathematica [A] time = 0.164156, size = 108, normalized size = 1.2

$$\frac{\frac{2B(b\log(a+bx)(df-cg)+\log(c+dx)(adg-bdf)+g(bc-ad)\log(f+gx))}{(bf-ag)(df-cg)} - \frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{f+gx}}{g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)) + (2*B*(b*(d*f - c*g
)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f + g*
x]))/((b*f - a*g)*(d*f - c*g)))/g
```

Maple [B] time = 0.09, size = 388, normalized size = 4.3

$$\frac{dA}{cg-df}\left(\frac{cg}{dx+c}-\frac{df}{dx+c}-g\right)^{-1} + \frac{Bb}{ag-bf}\ln\left(\frac{e}{d^2}\left(\frac{ad}{dx+c}-\frac{bc}{dx+c}+b\right)^2\right)\left(\frac{cg}{dx+c}-\frac{df}{dx+c}-g\right)^{-1} + \frac{Bda}{(ag-bf)(dx+c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x)
```

```
[Out] d*A/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)/(c*g-d*f)+1/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)
*b*B/(a*g-b*f)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d/(1/(d*x+c)*c*g-d
*f/(d*x+c)-g)*B/(a*g-b*f)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)
*a-1/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*B/(a*g-b*f)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-
b*c/(d*x+c)+b)^2/d^2)*b*c-2*d*B/(a*c*g^2-a*d*f*g-b*c*f*g+b*d*f^2)*ln(1/(d*x
+c)*c*g-d*f/(d*x+c)-g)*a+2*B/(a*c*g^2-a*d*f*g-b*c*f*g+b*d*f^2)*ln(1/(d*x+c)
*c*g-d*f/(d*x+c)-g)*b*c
```

Maxima [B] time = 1.17778, size = 259, normalized size = 2.88

$$B\left(\frac{2\,b\log\left(bx+a\right)}{bfg-ag^2}-\frac{2\,d\log\left(dx+c\right)}{dfg-cg^2}+\frac{2\,(bc-ad)\log\left(gx+f\right)}{bdf^2+acg^2-(bc+ad)fg}-\frac{\log\left(\frac{b^2ex^2}{d^2x^2+2\,cdx+c^2}+\frac{2\,abex}{d^2x^2+2\,cdx+c^2}+\frac{a^2e}{d^2x^2+2\,cdx+c^2}\right)}{g^2x+fg}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x, algorithm="maxima")
```

```
[Out] B*(2*b*log(b*x + a)/(b*f*g - a*g^2) - 2*d*log(d*x + c)/(d*f*g - c*g^2) + 2*
(b*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b^2*e*
x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e
/(d^2*x^2 + 2*c*d*x + c^2))/(g^2*x + f*g)) - A/(g^2*x + f*g)
```

Fricas [B] time = 22.2962, size = 613, normalized size = 6.81

$$-\frac{Abdf^2+Aacg^2-(Abc+Aad)fg-2\left(Bbdf^2-Bbcfg+\left(Bbdfg-Bbcg^2\right)x\right)\log\left(bx+a\right)+2\left(Bbdf^2-Badfg+\left(Bbd\right.\right.}{bdf^3g+acfg^3-(bc+a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x, algorithm="fricas")
```

```
[Out] -(A*b*d*f^2 + A*a*c*g^2 - (A*b*c + A*a*d)*f*g - 2*(B*b*d*f^2 - B*b*c*f*g +
(B*b*d*f*g - B*b*c*g^2)*x)*log(b*x + a) + 2*(B*b*d*f^2 - B*a*d*f*g + (B*b*d
```

```
*f*g - B*a*d*g^2)*x)*log(d*x + c) - 2*((B*b*c - B*a*d)*g^2*x + (B*b*c - B*a
*d)*f*g)*log(g*x + f) + (B*b*d*f^2 + B*a*c*g^2 - (B*b*c + B*a*d)*f*g)*log((
b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)))/(b*d*f^3*g + a*c
*f*g^3 - (b*c + a*d)*f^2*g^2 + (b*d*f^2*g^2 + a*c*g^4 - (b*c + a*d)*f*g^3)*
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**2,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.269 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^3}\,dx$

Optimal. Leaf size=175

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{g(bf-ag)^2}-\frac{B(bc-ad)}{(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)}{(bf-ag)^2(df-cg)^2}-$$

```
[Out] -((B*(b*c - a*d))/((b*f - a*g)*(d*f - c*g)*(f + g*x))) + (b^2*B*Log[a + b*x
])/(g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*g*(f + g
*x)^2) - (B*d^2*Log[c + d*x])/(g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f -
 b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rubi [A] time = 0.169762, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{2g(f+gx)^2}+\frac{b^2B\log(a+bx)}{g(bf-ag)^2}-\frac{B(bc-ad)}{(f+gx)(bf-ag)(df-cg)}+\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)}{(bf-ag)^2(df-cg)^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^3,x]
```

```
[Out] -((B*(b*c - a*d))/((b*f - a*g)*(d*f - c*g)*(f + g*x))) + (b^2*B*Log[a + b*x
])/(g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(2*g*(f + g
*x)^2) - (B*d^2*Log[c + d*x])/(g*(d*f - c*g)^2) + (B*(b*c - a*d)*(2*b*d*f -
 b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^3}\,dx &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2}+\frac{B\int\frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{2g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}\\ &= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2}+\frac{(B(bc-ad))\int\left(\frac{b^3}{(bc-ad)(bf-ag)^2(a+bx)}-\frac{d^3}{(bc-ad)(-df+cg)^2(c+dx)}+\frac{g}{(bf-ag)(df}\right.}{g}\\ &= -\frac{B(bc-ad)}{(bf-ag)(df-cg)(f+gx)}+\frac{b^2B\log(a+bx)}{g(bf-ag)^2}-\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{2g(f+gx)^2}-\frac{Bd^2\log(c+dx)}{g(df-cg)^2}+\end{aligned}$$

Mathematica [A] time = 0.655836, size = 172, normalized size = 0.98

$$\frac{2B(bc-ad)\left(\frac{b^2\log(a+bx)}{(bc-ad)(bf-ag)^2}+\frac{\frac{d^2\log(c+dx)}{ad-bc}+\frac{g(cg-df)}{(f+gx)(bf-ag)}-\frac{g\log(f+gx)(adg+bcg-2bdf)}{(bf-ag)^2}}{(df-cg)^2}\right)-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{(f+gx)^2}}{2g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^3,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^2) + 2*B*(b*c - a*d)*
((b^2*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^2) + ((g*(-(d*f) + c*g))/((b*f
 - a*g)*(f + g*x)) + (d^2*Log[c + d*x])/(-(b*c) + a*d) - (g*(-2*b*d*f + b*c
*g + a*d*g)*Log[f + g*x])/(b*f - a*g)^2)/(d*f - c*g)^2))/(2*g)
```

Maple [B] time = 0.174, size = 1554, normalized size = 8.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x)
```

```
[Out] -1/2*d^2*A*g/(c*g-d*f)^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2-d^2*A/(c*g-d*f)^2/
(1/(d*x+c)*c*g-d*f/(d*x+c)-g)-d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2/(a*g-b*f)
/(d*x+c)^2*B*a+d/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2/(a*g-b*f)/(d*x+c)^2*B*b*c-
1/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*b^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)
*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c*g+d/(1/(d*x+c)*c*g-d*f/(d*x+c)
-g)^2*b^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*
x+c)+b)^2/d^2)*f+d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*g/(a*c*g^2-a*d*f*g-b*c
*f*g+b*d*f^2)/(d*x+c)*B*a-d/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*g/(a*c*g^2-a*d*
f*g-b*c*f*g+b*d*f^2)/(d*x+c)*B*b*c-1/2*d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*
B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^
2/d^2)*a^2*g+d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*B/(a^2*g^2-2*a*b*f*g+b^2*f
^2)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a*b*f+1/2/(1/(d*x+c
)*c*g-d*f/(d*x+c)-g)^2*B/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*ln(e*(1/(d*x
+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*b^2*c^2*g-d/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*B
/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2
/d^2)*b^2*c*f+1/2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2*b^2*g*B/(a^2*g^2-2*a*b*f*
g+b^2*f^2)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+d^2*B/(a^2*c^2*g^4-2*a
^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^
3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)*ln(1/(d*x+c)*c*g-d*f/(d*x+
c)-g)*a^2*g-2*d^2*B/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*
f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2
*d^2*f^4)*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*a*b*f-B/(a^2*c^2*g^4-2*a^2*c*d*f*
g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c
^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*b^2
*c^2*g+2*d*B/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4
*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^
4)*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*b^2*c*f
```

Maxima [B] time = 1.31545, size = 547, normalized size = 3.13

$$\frac{1}{2}\left(\frac{2\,b^2\log\left(bx+a\right)}{b^2f^2g-2\,abfg^2+a^2g^3}-\frac{2\,d^2\log\left(dx+c\right)}{d^2f^2g-2\,cdfg^2+c^2g^3}+\frac{2\left(2\left(b^2cd-abd^2\right)f-\left(b^2c^2-a^2d^2\right)g\right)\log\left(g\right.}{b^2d^2f^4+a^2c^2g^4-2\left(b^2cd+abd^2\right)f^3g+\left(b^2c^2+4\,abcd+a^2d^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - 2*d^2*log(d*x
 + c)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + 2*(2*(b^2*c*d - a*b*d^2)*f - (b
^2*c^2 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d +
 a*b*d^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^
2*c*d)*f*g^3) - 2*(b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b
*d*f^2*g + a*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d
*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x
+ c^2))/(g^3*x^2 + 2*f*g^2*x + f^2*g))*B - 1/2*A/(g^3*x^2 + 2*f*g^2*x + f^2
*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.83874, size = 1148, normalized size = 6.56

$$\frac{\left(2\,Bb^2cdf - 2\,Babd^2f - Bb^2c^2g + Ba^2d^2g\right)\log\left(gx+f\right)}{b^2d^2f^4 - 2\,b^2cdf^3g - 2\,abd^2f^3g + b^2c^2f^2g^2 + 4\,abcdf^2g^2 + a^2d^2f^2g^2 - 2\,abc^2fg^3 - 2\,a^2cdfg^3 + a^2c^2g^4} - \frac{B\log\left(\frac{b^2x^2+2}{d^2x^2+2}\right.}{2\left(g^3x^2+2\,fg\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] (2*B*b^2*c*d*f - 2*B*a*b*d^2*f - B*b^2*c^2*g + B*a^2*d^2*g)*log(g*x + f)/(b
^2*d^2*f^4 - 2*b^2*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b*c*
d*f^2*g^2 + a^2*d^2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^2*g
^4) - 1/2*B*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(g^3*x
^2 + 2*f*g^2*x + f^2*g) - 1/2*(2*B*b^2*c*d*f - 2*B*a*b*d^2*f - B*b^2*c^2*g
+ B*a^2*d^2*g)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^2*d^2*f^4 - 2*b^2
*c*d*f^3*g - 2*a*b*d^2*f^3*g + b^2*c^2*f^2*g^2 + 4*a*b*c*d*f^2*g^2 + a^2*d^
2*f^2*g^2 - 2*a*b*c^2*f*g^3 - 2*a^2*c*d*f*g^3 + a^2*c^2*g^4) - 1/2*(2*B*b*c
*g^2*x - 2*B*a*d*g^2*x + A*b*d*f^2 + B*b*d*f^2 - A*b*c*f*g + B*b*c*f*g - A*
a*d*f*g - 3*B*a*d*f*g + A*a*c*g^2 + B*a*c*g^2)/(b*d*f^2*g^3*x^2 - b*c*f*g^4
*x^2 - a*d*f*g^4*x^2 + a*c*g^5*x^2 + 2*b*d*f^3*g^2*x - 2*b*c*f^2*g^3*x - 2*
a*d*f^2*g^3*x + 2*a*c*f*g^4*x + b*d*f^4*g - b*c*f^3*g^2 - a*d*f^3*g^2 + a*c
*f^2*g^3) + 1/2*(2*B*b^3*c*d^2*f^2 - 2*B*a*b^2*d^3*f^2 - 2*B*b^3*c^2*d*f*g
+ 2*B*a^2*b*d^3*f*g + B*b^3*c^3*g^2 - B*a*b^2*c^2*d*g^2 + B*a^2*b*c*d^2*g^2
 - B*a^3*d^3*g^2)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x
+ b*c + a*d + abs(-b*c + a*d))))/((b^2*d^2*f^4*g - 2*b^2*c*d*f^3*g^2 - 2*a*
b*d^2*f^3*g^2 + b^2*c^2*f^2*g^3 + 4*a*b*c*d*f^2*g^3 + a^2*d^2*f^2*g^3 - 2*a
*b*c^2*f*g^4 - 2*a^2*c*d*f*g^4 + a^2*c^2*g^5)*abs(-b*c + a*d))
```

3.270 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^4}\,dx$

Optimal. Leaf size=277

$$\frac{2B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3g(f+gx)^3}+\frac{2b^3B\log(a+b}{3g(bf-ag)^3}$$

```
[Out] -(B*(b*c - a*d))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (2*B*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*
b^3*B*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])/(3*g*(f + g*x)^3) - (2*B*d^3*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (2
*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*
d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rubi [A] time = 0.327443, antiderivative size = 277, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$\frac{2B(bc-ad)\log(f+gx)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{3(bf-ag)^3(df-cg)^3}-\frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A}{3g(f+gx)^3}+\frac{2b^3B\log(a+b}{3g(bf-ag)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^4,x]
```


```
[Out] -(B*(b*c - a*d))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) - (2*B*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (2*
b^3*B*Log[a + b*x])/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])/(3*g*(f + g*x)^3) - (2*B*d^3*Log[c + d*x])/(3*g*(d*f - c*g)^3) + (2
*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*
d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```


Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
```

```
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^4}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3g(f+gx)^3} + \frac{B\int \frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3g(f+gx)^3} + \frac{(2B(bc-ad))\int \frac{1}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{3g(f+gx)^3} + \frac{(2B(bc-ad))\int \left(\frac{b^4}{(bc-ad)(bf-ag)^3(a+bx)} + \frac{d^4}{(bc-ad)(-df+cg)^3(c+dx)} + \frac{\ldots}{(bf-ag\ldots}\right.}{\ldots}$$

$$= -\frac{B(bc-ad)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{2B(bc-ad)(2bdf-bcg-adg)}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{2b^3B\log(a+bx)}{3g(bf-ag)^3} - \frac{A\ldots}{\ldots}$$

Mathematica [A] time = 0.891529, size = 263, normalized size = 0.95

$$\frac{2B(bc-ad)\left(\frac{g\log(f+gx)\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(bf-ag)^3(df-cg)^3} + \frac{b^3\log(a+bx)}{(bc-ad)(bf-ag)^3} + \frac{d^3\log(c+dx)}{(bc-ad)(cg-df)^3} + \frac{g(adg+bcg-2bdf)}{(f+gx)(bf-ag)^2(df-cg)^2} - \frac{\ldots}{2(f\ldots}\right.}{3g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^4,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^3) + 2*B*(b*c - a*d)*
(-g/(2*(b*f - a*g)*(d*f - c*g)*(f + g*x)^2) + (g*(-2*b*d*f + b*c*g + a*d*g)
```

```
)/((b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (b^3*Log[a + b*x])/((b*c - a*d)
*(b*f - a*g)^3) + (d^3*Log[c + d*x])/((b*c - a*d)*(-(d*f) + c*g)^3) + (g*(a
^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)
)*Log[f + g*x])/((b*f - a*g)^3*(d*f - c*g)^3)))/(3*g)
```

Maple [B] time = 0.277, size = 4421, normalized size = 16.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x)
```

```
[Out] d^3*A/(c*g-d*f)^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)-2/3*d^3*B/(a^3*c^3*g^6-3*a^
3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b
*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^
4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3
*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-d*
f/(d*x+c)-g)*a^3*g^2+2/3*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g
^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^
3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2
*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*
c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*b^3*c^3*g^2+1/3/(1
/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*b^3*g^2*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*
g-b^3*f^3)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)+1/3*d^2/(1/(d*x+c)*c*g
-d*f/(d*x+c)-g)^3/(c*g-d*f)*g^2/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*a*b
*c+d^3*A*g/(c*g-d*f)^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^2+1/3*d^3*A*g^2/(c*g-d
*f)^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3+5/3*d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)
^3/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^3*B*b^2*c*f-5/3*d^3/(1/(d*x+c)*c*g-d
*f/(d*x+c)-g)^3/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^3*B*a*b*f-2/3*d/(1/(d*x
+c)*c*g-d*f/(d*x+c)-g)^3*g^3/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2
*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*
f^3*g+b^2*d^2*f^4)/(d*x+c)*B*b^2*c^2-2/3*d/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3/
(a^2*g^2-2*a*b*f*g+b^2*f^2)*g/(d*x+c)^3*B*b^2*c^2-5/3*d^3/(1/(d*x+c)*c*g-d*
f/(d*x+c)-g)^3/(c*g-d*f)*g^2/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*a^2-1/
3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^
3*f^3)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*b^3*c^3*g^2+1/(1
/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*b^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^
3*f^3)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c^2*g^2-1/(1/(d*
x+c)*c*g-d*f/(d*x+c)-g)^3*b^3*g^2*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^
3*f^3)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*c+1/3*d^3/(1/(d*x+
c)*c*g-d*f/(d*x+c)-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*
```

x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a^3*g^2+d^2/(1/(d*x+c)*c*g
-d*f/(d*x+c)-g)^3*b^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+
c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f^2+2*d^3*B/(a^3*c^3*g^6-3*a
^3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*
b*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g
^4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^
3*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-d
*f/(d*x+c)-g)*a^2*b*f*g-2*d*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^
2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2
*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*
b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b
^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*b^3*c^2*f*g+d/(
1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*b^3*g*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b^2*f^2*g
-b^3*f^3)/(d*x+c)*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*f+2/3*d^3/(1/(d
*x+c)*c*g-d*f/(d*x+c)-g)^3*g^3/(a^2*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2
-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*
d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*a^2+d^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3/(a^2
*g^2-2*a*b*f*g+b^2*f^2)*g/(d*x+c)^3*B*a^2+2*d^2*B/(a^3*c^3*g^6-3*a^3*c^2*d*
f*g^5+3*a^3*c*d^2*f^2*g^4-a^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f
^2*g^4-9*a^2*b*c*d^2*f^3*g^3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^
2*c^2*d*f^3*g^3+9*a*b^2*c*d^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b
^3*c^2*d*f^4*g^2-3*b^3*c*d^2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-d*f/(d*x+c
)-g)*b^3*c*f^2-2*d^3*B/(a^3*c^3*g^6-3*a^3*c^2*d*f*g^5+3*a^3*c*d^2*f^2*g^4-a
^3*d^3*f^3*g^3-3*a^2*b*c^3*f*g^5+9*a^2*b*c^2*d*f^2*g^4-9*a^2*b*c*d^2*f^3*g^
3+3*a^2*b*d^3*f^4*g^2+3*a*b^2*c^3*f^2*g^4-9*a*b^2*c^2*d*f^3*g^3+9*a*b^2*c*d
^2*f^4*g^2-3*a*b^2*d^3*f^5*g-b^3*c^3*f^3*g^3+3*b^3*c^2*d*f^4*g^2-3*b^3*c*d^
2*f^5*g+b^3*d^3*f^6)*ln(1/(d*x+c)*c*g-d*f/(d*x+c)-g)*a*b^2*f^2+4/3*d/(1/(d*
x+c)*c*g-d*f/(d*x+c)-g)^3/(c*g-d*f)*g^2/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)
^2*B*b^2*c^2+d^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3
*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*a
*b^2*f^2-d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*B/(a^3*g^3-3*a^2*b*f*g^2+3*a*b
^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2/d^2)*b^3*c
*f^2+4/3*d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*g^2/(a^2*c^2*g^4-2*a^2*c*d*f*g
^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-2*a*b*d^2*f^3*g+b^2*c^
2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*b^2*c*f+3*d^3/(1/(d*x+c)*c
*g-d*f/(d*x+c)-g)^3/(c*g-d*f)*g/(a^2*g^2-2*a*b*f*g+b^2*f^2)/(d*x+c)^2*B*a*b
*f-3*d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3/(c*g-d*f)*g/(a^2*g^2-2*a*b*f*g+b^2
*f^2)/(d*x+c)^2*B*b^2*c*f-d^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*B/(a^3*g^3-3*
a^2*b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c
)+b)^2/d^2)*a^2*b*f*g+d/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*B/(a^3*g^3-3*a^2*b*
f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^3*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)^2
/d^2)*b^3*c^2*f*g-2*d/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*b^3*B/(a^3*g^3-3*a^2*
b*f*g^2+3*a*b^2*f^2*g-b^3*f^3)/(d*x+c)^2*ln(e*(1/(d*x+c)*a*d-b*c/(d*x+c)+b)
^2/d^2)*c*f*g-1/3*d^2/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3/(a^2*g^2-2*a*b*f*g+b^
2*f^2)*g/(d*x+c)^3*B*a*b*c-4/3*d^3/(1/(d*x+c)*c*g-d*f/(d*x+c)-g)^3*g^2/(a^2

```
*c^2*g^4-2*a^2*c*d*f*g^3+a^2*d^2*f^2*g^2-2*a*b*c^2*f*g^3+4*a*b*c*d*f^2*g^2-
2*a*b*d^2*f^3*g+b^2*c^2*f^2*g^2-2*b^2*c*d*f^3*g+b^2*d^2*f^4)/(d*x+c)*B*a*b*
f
```

Maxima [B] time = 1.53729, size = 1215, normalized size = 4.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x, algorithm="maxima")
```

```
[Out] 1/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*
x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x +
 c^2))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*B - 1/3*A/(g^4*x^3 +
3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x, algorithm="fricas")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 3.94971, size = 2788, normalized size = 10.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] 2/3*(3*B*b^3*c*d^2*f^2 - 3*B*a*b^2*d^3*f^2 - 3*B*b^3*c^2*d*f*g + 3*B*a^2*b*
d^3*f*g + B*b^3*c^3*g^2 - B*a^3*d^3*g^2)*log(g*x + f)/(b^3*d^3*f^6 - 3*b^3*
c*d^2*f^5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g
^2 + 3*a^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*
b*c*d^2*f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2
*g^4 + 3*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^
3*g^6) - 1/3*B*log((b^2*x^2 + 2*a*b*x + a^2)/(d^2*x^2 + 2*c*d*x + c^2))/(g^
4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) - 1/3*(3*B*b^3*c*d^2*f^2 - 3*B*a
*b^2*d^3*f^2 - 3*B*b^3*c^2*d*f*g + 3*B*a^2*b*d^3*f*g + B*b^3*c^3*g^2 - B*a^
3*d^3*g^2)*log(abs(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^3*d^3*f^6 - 3*b^3*c*d
^2*f^5*g - 3*a*b^2*d^3*f^5*g + 3*b^3*c^2*d*f^4*g^2 + 9*a*b^2*c*d^2*f^4*g^2
+ 3*a^2*b*d^3*f^4*g^2 - b^3*c^3*f^3*g^3 - 9*a*b^2*c^2*d*f^3*g^3 - 9*a^2*b*c
*d^2*f^3*g^3 - a^3*d^3*f^3*g^3 + 3*a*b^2*c^3*f^2*g^4 + 9*a^2*b*c^2*d*f^2*g^
4 + 3*a^3*c*d^2*f^2*g^4 - 3*a^2*b*c^3*f*g^5 - 3*a^3*c^2*d*f*g^5 + a^3*c^3*g
^6) - 1/3*(4*B*b^2*c*d*f*g^3*x^2 - 4*B*a*b*d^2*f*g^3*x^2 - 2*B*b^2*c^2*g^4*
x^2 + 2*B*a^2*d^2*g^4*x^2 + 9*B*b^2*c*d*f^2*g^2*x - 9*B*a*b*d^2*f^2*g^2*x -
 5*B*b^2*c^2*f*g^3*x + 5*B*a^2*d^2*f*g^3*x + B*a*b*c^2*g^4*x - B*a^2*c*d*g^
4*x + A*b^2*d^2*f^4 + B*b^2*d^2*f^4 - 2*A*b^2*c*d*f^3*g + 3*B*b^2*c*d*f^3*g
 - 2*A*a*b*d^2*f^3*g - 7*B*a*b*d^2*f^3*g + A*b^2*c^2*f^2*g^2 - 2*B*b^2*c^2*
```

f^2*g^2 + 4*A*a*b*c*d*f^2*g^2 + 4*B*a*b*c*d*f^2*g^2 + A*a^2*d^2*f^2*g^2 + 4
*B*a^2*d^2*f^2*g^2 - 2*A*a*b*c^2*f*g^3 - B*a*b*c^2*f*g^3 - 2*A*a^2*c*d*f*g^
3 - 3*B*a^2*c*d*f*g^3 + A*a^2*c^2*g^4 + B*a^2*c^2*g^4)/(b^2*d^2*f^4*g^4*x^3
 - 2*b^2*c*d*f^3*g^5*x^3 - 2*a*b*d^2*f^3*g^5*x^3 + b^2*c^2*f^2*g^6*x^3 + 4*
a*b*c*d*f^2*g^6*x^3 + a^2*d^2*f^2*g^6*x^3 - 2*a*b*c^2*f*g^7*x^3 - 2*a^2*c*d
*f*g^7*x^3 + a^2*c^2*g^8*x^3 + 3*b^2*d^2*f^5*g^3*x^2 - 6*b^2*c*d*f^4*g^4*x^
2 - 6*a*b*d^2*f^4*g^4*x^2 + 3*b^2*c^2*f^3*g^5*x^2 + 12*a*b*c*d*f^3*g^5*x^2
+ 3*a^2*d^2*f^3*g^5*x^2 - 6*a*b*c^2*f^2*g^6*x^2 - 6*a^2*c*d*f^2*g^6*x^2 + 3
*a^2*c^2*f*g^7*x^2 + 3*b^2*d^2*f^6*g^2*x - 6*b^2*c*d*f^5*g^3*x - 6*a*b*d^2*
f^5*g^3*x + 3*b^2*c^2*f^4*g^4*x + 12*a*b*c*d*f^4*g^4*x + 3*a^2*d^2*f^4*g^4*
x - 6*a*b*c^2*f^3*g^5*x - 6*a^2*c*d*f^3*g^5*x + 3*a^2*c^2*f^2*g^6*x + b^2*d
^2*f^7*g - 2*b^2*c*d*f^6*g^2 - 2*a*b*d^2*f^6*g^2 + b^2*c^2*f^5*g^3 + 4*a*b*
c*d*f^5*g^3 + a^2*d^2*f^5*g^3 - 2*a*b*c^2*f^4*g^4 - 2*a^2*c*d*f^4*g^4 + a^2
*c^2*f^3*g^5) + 1/3*(2*B*b^4*c*d^3*f^3 - 2*B*a*b^3*d^4*f^3 - 3*B*b^4*c^2*d^
2*f^2*g + 3*B*a^2*b^2*d^4*f^2*g + 3*B*b^4*c^3*d*f*g^2 - 3*B*a*b^3*c^2*d^2*f
*g^2 + 3*B*a^2*b^2*c*d^3*f*g^2 - 3*B*a^3*b*d^4*f*g^2 - B*b^4*c^4*g^3 + B*a*
b^3*c^3*d*g^3 - B*a^3*b*c*d^3*g^3 + B*a^4*d^4*g^3)*log(abs((2*b*d*x + b*c +
 a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c + a*d))))/((b^3*d^3
*f^6*g - 3*b^3*c*d^2*f^5*g^2 - 3*a*b^2*d^3*f^5*g^2 + 3*b^3*c^2*d*f^4*g^3 +
9*a*b^2*c*d^2*f^4*g^3 + 3*a^2*b*d^3*f^4*g^3 - b^3*c^3*f^3*g^4 - 9*a*b^2*c^2
*d*f^3*g^4 - 9*a^2*b*c*d^2*f^3*g^4 - a^3*d^3*f^3*g^4 + 3*a*b^2*c^3*f^2*g^5
+ 9*a^2*b*c^2*d*f^2*g^5 + 3*a^3*c*d^2*f^2*g^5 - 3*a^2*b*c^3*f*g^6 - 3*a^3*c
^2*d*f*g^6 + a^3*c^3*g^7)*abs(-b*c + a*d))

3.271 $\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^5}\,dx$

Optimal. Leaf size=381

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{2(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)\left(-a\right.}{2(bf-ag}$$

```
[Out] -(B*(b*c - a*d))/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g))/(4*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*
(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f
*g + c^2*g^2)))/(2*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*Log[a +
b*x])/(2*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(4*g*(
f + g*x)^4) - (B*d^4*Log[c + d*x])/(2*g*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*
b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*
d*f*g + c^2*g^2))*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rubi [A] time = 0.553283, antiderivative size = 381, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {2525, 12, 72}

$$-\frac{B(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{2(f+gx)(bf-ag)^3(df-cg)^3}-\frac{B(bc-ad)\log(f+gx)(-adg-bcg+2bdf)\left(-a\right.}{2(bf-ag}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^5,x]
```

```
[Out] -(B*(b*c - a*d))/(6*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g))/(4*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*
(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f
*g + c^2*g^2)))/(2*(b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) + (b^4*B*Log[a +
b*x])/(2*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(4*g*(
f + g*x)^4) - (B*d^4*Log[c + d*x])/(2*g*(d*f - c*g)^4) - (B*(b*c - a*d)*(2*
b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*
d*f*g + c^2*g^2))*Log[f + g*x])/(2*(b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(f+gx)^5}\,dx = -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4g(f+gx)^4}+\frac{B\int\frac{2(bc-ad)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{4g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4g(f+gx)^4}+\frac{(B(bc-ad))\int\frac{1}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{4g(f+gx)^4}+\frac{(B(bc-ad))\int\left(\frac{b^5}{(bc-ad)(bf-ag)^4(a+bx)}-\frac{d^5}{(bc-ad)(-df+cg)^4(c+dx)}+\frac{g}{(bf-ag)(df}\right.}{}$$

$$= -\frac{B(bc-ad)}{6(bf-ag)(df-cg)(f+gx)^3}-\frac{B(bc-ad)(2bdf-bcg-adg)}{4(bf-ag)^2(df-cg)^2(f+gx)^2}-\frac{B(bc-ad)\left(a^2d^2g^2-ab\right.}{2(bf}$$

Mathematica [A] time = 1.13547, size = 358, normalized size = 0.94

$$\frac{2B(bc-ad)\left(-\frac{g\left(a^2d^2g^2+abdg(cg-3df)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)}{(f+gx)(bf-ag)^3(df-cg)^3}-\frac{g\log(f+gx)(adg+bcg-2bdf)\left(a^2d^2g^2-2abd^2fg+b^2\left(c^2g^2-2cdfg+2d^2f^2\right)\right)}{(bf-ag)^4(df-cg)^4}+\frac{b^4\log(}{(bc-ad)(b}\right.}{4g}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^5,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(f + g*x)^4) + 2*B*(b*c - a*d)*
(-g/(3*(b*f - a*g)*(d*f - c*g)*(f + g*x)^3) + (g*(-2*b*d*f + b*c*g + a*d*g)
)/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2 + a*b*d*g*(
-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2)))/((b*f - a*g)^3*(d*f
 - c*g)^3*(f + g*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^4) - (d^
4*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^4) - (g*(-2*b*d*f + b*c*g + a*d*g)
*(-2*a*b*d^2*f*g + a^2*d^2*g^2 + b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log
[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4)))/(4*g)
```

Maple [B] time = 0.438, size = 10401, normalized size = 27.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.92675, size = 2442, normalized size = 6.41

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x, algorithm="maxima")
```

```
[Out] 1/12*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
 4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
 + 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d
^4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f
*g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4
*(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b
^2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*
d^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*
d^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
 a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2
```

```
*g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
 31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b
*c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c
^3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
 a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2
*d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2
*d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^
3*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*
d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b
*c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g
^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3
*(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3
)*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d
)*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^
3)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*
c^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^
3*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*
c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a
^2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f
^4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 3*log(b^2*e*x^2/(d^2*x^2 +
 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*
c*d*x + c^2))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
)*B - 1/4*A/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x, algorithm="fricas")

[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))/(g*x+f)**5,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError
```

3.272 $\int (f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx$

Optimal. Leaf size=869

$$\frac{2B^2g^3\log\left(\frac{a+bx}{c+dx}\right)(bc-ad)^4}{3b^4d^4}+\frac{2B^2g^3\log(c+dx)(bc-ad)^4}{3b^4d^4}+\frac{2B^2g^3x(bc-ad)^3}{3b^3d^3}+\frac{B^2g^2(4bdf-3bcg-adg)\log\left(\frac{a+bx}{c+dx}\right)(bc}{b^4d^4}$$

```
[Out] (2*B^2*(b*c - a*d)^3*g^3*x)/(3*b^3*d^3) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f -
 3*b*c*g - a*d*g)*x)/(b^3*d^3) + (B^2*(b*c - a*d)^2*g^3*(c + d*x)^2)/(3*b^2
*d^4) - (B*(b*c - a*d)*g*(a^2*d^2*g^2 - 2*a*b*d*g*(2*d*f - c*g) + b^2*(6*d^
2*f^2 - 8*c*d*f*g + 3*c^2*g^2))*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2]))/(b^4*d^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*(c + d*
x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*b^2*d^4) - (B*(b*c - a*d)
*g^3*(c + d*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b*d^4) - ((b*
f - a*g)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(4*b^4*g) + ((f + g*
x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(4*g) - (B*(b*c - a*d)*(2*
b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*
d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[(b*c - a*d)/
(b*(c + d*x))])/(b^4*d^4) + (2*B^2*(b*c - a*d)^4*g^3*Log[(a + b*x)/(c + d*x
)])/(3*b^4*d^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*Log[(a
 + b*x)/(c + d*x)])/(b^4*d^4) + (2*B^2*(b*c - a*d)^4*g^3*Log[c + d*x])/(3*b
^4*d^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - 3*b*c*g - a*d*g)*Log[c + d*x])/
(b^4*d^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - 2*a*b*d*g*(2*d*f - c*g) +
 b^2*(6*d^2*f^2 - 8*c*d*f*g + 3*c^2*g^2))*Log[c + d*x])/(b^4*d^4) - (2*B^2*
(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2
*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(
b^4*d^4)
```

Rubi [A] time = 1.80806, antiderivative size = 973, normalized size of antiderivative = 1.12, number of steps used = 33, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{B^2\log^2(a+bx)(bf-ag)^4}{b^4g}-\frac{B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)(bf-ag)^4}{b^4g}-\frac{2B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)(bf-ag)^4}{b^4g}-$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-2*B^2*(b*c - a*d)^2*(b*c + a*d)*g^3*x)/(3*b^3*d^3) + (B^2*(b*c - a*d)^2*g
^2*(4*b*d*f - b*c*g - a*d*g)*x)/(b^3*d^3) - (A*B*(b*c - a*d)*g*(a^2*d^2*g^2
 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*x)/(b^3*d
^3) + (B^2*(b*c - a*d)^2*g^3*x^2)/(3*b^2*d^2) - (2*a^3*B^2*(b*c - a*d)*g^3*
Log[a + b*x])/(3*b^4*d) + (a^2*B^2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g
)*Log[a + b*x])/(b^4*d^2) + (B^2*(b*f - a*g)^4*Log[a + b*x]^2)/(b^4*g) - (B
^2*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*
c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b^4*d^3) -
 (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*x^2*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/(2*b^2*d^2) - (B*(b*c - a*d)*g^3*x^3*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2]))/(3*b*d) - (B*(b*f - a*g)^4*Log[a + b*x]*(A + B*Log[(e*
(a + b*x)^2)/(c + d*x)^2]))/(b^4*g) + ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2])^2)/(4*g) + (2*B^2*c^3*(b*c - a*d)*g^3*Log[c + d*x])/(3*b*d
^4) - (B^2*c^2*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(b^2
*d^4) + (2*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(4*d*f - c*g) + b^2*(
6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[c + d*x])/(b^4*d^4) - (2*B^2*(d*f - c
*g)^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^4*g) + (B*(d*f - c
*g)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(d^4*g) + (B^2
*(d*f - c*g)^4*Log[c + d*x]^2)/(d^4*g) - (2*B^2*(b*f - a*g)^4*Log[a + b*x]*
Log[(b*(c + d*x))/(b*c - a*d)])/(b^4*g) - (2*B^2*(b*f - a*g)^4*PolyLog[2, -
((d*(a + b*x))/(b*c - a*d))])/(b^4*g) - (2*B^2*(d*f - c*g)^4*PolyLog[2, (b*
(c + d*x))/(b*c - a*d)])/(d^4*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{B\int \frac{2(bc-ad)(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx}{2g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx}{g}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{(B(bc-ad))\int\left(\frac{g^2\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d\right.\right.}{}\right.}{}$$

$$= \frac{(f+gx)^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g} - \frac{\left(B(bc-ad)g^3\right)\int x^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{bd}$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{b^3d^3} -$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{b^3d^3} -$$

$$= -\frac{AB(bc-ad)g\left(a^2d^2g^2-abdg(4df-cg)+b^2\left(6d^2f^2-4cdfg+c^2g^2\right)\right)x}{b^3d^3} -$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} - \frac{AB(bc}{}$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} - \frac{AB(bc}{}$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} - \frac{AB(bc}{}$$

$$= -\frac{2B^2(bc-ad)^2(bc+ad)g^3x}{3b^3d^3} + \frac{B^2(bc-ad)^2g^2(4bdf-bcg-adg)x}{b^3d^3} - \frac{AB(bc}{}$$

Mathematica [A] time = 0.966501, size = 746, normalized size = 0.86

$$\frac{(f+gx)^4\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{2B\left(6b^4B(df-cg)^4\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-6Bd^4(bf-ag)^4\left(\log(a+bx)\left(\log\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] ((f + g*x)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (2*B*(6*A*b*d*(b*
c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d
*f*g + c^2*g^2))*x + 6*B*d*(b*c - a*d)*g^2*(a^2*d^2*g^2 + a*b*d*g*(-4*d*f +
 c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*Log[(e*(a + b*x)^2
)/(c + d*x)^2] + 3*b^2*d^2*(b*c - a*d)*g^3*(4*b*d*f - b*c*g - a*d*g)*x^2*(A
 + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*b^3*d^3*(b*c - a*d)*g^4*x^3*(A +
 B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 6*d^4*(b*f - a*g)^4*Log[a + b*x]*(A
+ B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 12*B*(b*c - a*d)^2*g^2*(a^2*d^2*g^2
 + a*b*d*g*(-4*d*f + c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))*Log[c +
d*x] - 6*b^4*(d*f - c*g)^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c +
 d*x] + 2*B*(b*c - a*d)*g^4*(b*d*(b*c - a*d)*x*(2*b*c + 2*a*d - b*d*x) + 2*
a^3*d^3*Log[a + b*x] - 2*b^3*c^3*Log[c + d*x]) - 6*B*(b*c - a*d)*g^3*(-4*b*
d*f + b*c*g + a*d*g)*(-(a^2*d^2*Log[a + b*x]) + b*(d*(-(b*c) + a*d)*x + b*c
^2*Log[c + d*x])) - 6*B*d^4*(b*f - a*g)^4*(Log[a + b*x]*(Log[a + b*x] - 2*L
og[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]
) + 6*b^4*B*(d*f - c*g)^4*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d
*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])))/(3*b^4*d^4))
/(4*g)
```

Maple [F] time = 1.77, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{3}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((g*x+f)^3*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 1.9495, size = 3174, normalized size = 3.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] 1/4*A^2*g^3*x^4 + A^2*f*g^2*x^3 + 3/2*A^2*f^2*g*x^2 + 2*(x*log(b^2*e*x^2/(d
^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*
x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*A*B*f^3 +
3*(x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d
*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c
^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d))*A*B*f^2*g + 2*(x^3*log(b^2*e*x
^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/
(d^2*x^2 + 2*c*d*x + c^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^
3 - ((b^2*c*d - a*b*d^2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*f*g^
2 + 1/6*(3*x^4*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2
 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) - 6*a^4*log(b*x + a)/b
^4 + 6*c^4*log(d*x + c)/d^4 - (2*(b^3*c*d^2 - a*b^2*d^3)*x^3 - 3*(b^3*c^2*d
 - a^2*b*d^3)*x^2 + 6*(b^3*c^3 - a^3*d^3)*x)/(b^3*d^3))*A*B*g^3 + A^2*f^3*x
 - 1/3*(6*a^3*c*d^3*g^3 - 3*(8*c*d^3*f*g^2 - c^2*d^2*g^3)*a^2*b + 2*(18*c*d
^3*f^2*g - 6*c^2*d^2*f*g^2 + c^3*d*g^3)*a*b^2 + (12*c*d^3*f^3*log(e) - (3*g
^3*log(e) + 11*g^3)*c^4 + 12*(f*g^2*log(e) + 3*f*g^2)*c^3*d - 18*(f^2*g*log
(e) + 2*f^2*g)*c^2*d^2)*b^3)*B^2*log(d*x + c)/(b^3*d^4) + 2*(4*a*b^3*d^4*f^
3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3 - (4*c*d^3*f^3 -
6*c^2*d^2*f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*b^4)*(log(b*x + a)*log((b*d*x +
a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^4*d^4) +
1/12*(3*B^2*b^4*d^4*g^3*x^4*log(e)^2 + 4*(a*b^3*d^4*g^3*log(e) + (3*d^4*f*g
^2*log(e)^2 - c*d^3*g^3*log(e))*b^4)*B^2*x^3 - 2*((3*g^3*log(e) - 2*g^3)*a^
2*b^2*d^4 - 4*(3*d^4*f*g^2*log(e) - c*d^3*g^3)*a*b^3 - (9*d^4*f^2*g*log(e)^
2 - 12*c*d^3*f*g^2*log(e) + (3*g^3*log(e) + 2*g^3)*c^2*d^2)*b^4)*B^2*x^2 +
4*((3*g^3*log(e) - 5*g^3)*a^3*b*d^4 + (5*c*d^3*g^3 - 12*(f*g^2*log(e) - f*g
^2)*d^4)*a^2*b^2 + (18*d^4*f^2*g*log(e) - 24*c*d^3*f*g^2 + 5*c^2*d^2*g^3)*a
*b^3 + (3*d^4*f^3*log(e)^2 - 18*c*d^3*f^2*g*log(e) - (3*g^3*log(e) + 5*g^3)
*c^3*d + 12*(f*g^2*log(e) + f*g^2)*c^2*d^2)*b^4)*B^2*x + 12*(B^2*b^4*d^4*g^
3*x^4 + 4*B^2*b^4*d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f
^3*x + (4*a*b^3*d^4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4
*g^3)*B^2)*log(b*x + a)^2 + 12*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*d^4*f*g^2*x
^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*c*d^3*f^3 - 6*c^2*d
^2*f^2*g + 4*c^3*d*f*g^2 - c^4*g^3)*B^2*b^4)*log(d*x + c)^2 + 4*(3*B^2*b^4*
d^4*g^3*x^4*log(e) + 2*(a*b^3*d^4*g^3 + (6*d^4*f*g^2*log(e) - c*d^3*g^3)*b^
4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (6*d^4*f^2*g*log(e) -
```

```
 4*c*d^3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4*a^2*b
^2*d^4*f*g^2 + a^3*b*d^4*g^3 + (2*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*c^2*d^
2*f*g^2 - c^3*d*g^3)*b^4)*B^2*x - ((3*g^3*log(e) - 11*g^3)*a^4*d^4 + 2*(c*d
^3*g^3 - 6*(f*g^2*log(e) - 3*f*g^2)*d^4)*a^3*b - 3*(4*c*d^3*f*g^2 - c^2*d^2
*g^3 - 6*(f^2*g*log(e) - 2*f^2*g)*d^4)*a^2*b^2 - 6*(2*d^4*f^3*log(e) - 6*c*
d^3*f^2*g + 4*c^2*d^2*f*g^2 - c^3*d*g^3)*a*b^3)*B^2)*log(b*x + a) - 4*(3*B^
2*b^4*d^4*g^3*x^4*log(e) + 2*(a*b^3*d^4*g^3 + (6*d^4*f*g^2*log(e) - c*d^3*g
^3)*b^4)*B^2*x^3 + 3*(4*a*b^3*d^4*f*g^2 - a^2*b^2*d^4*g^3 + (6*d^4*f^2*g*lo
g(e) - 4*c*d^3*f*g^2 + c^2*d^2*g^3)*b^4)*B^2*x^2 + 6*(6*a*b^3*d^4*f^2*g - 4
*a^2*b^2*d^4*f*g^2 + a^3*b*d^4*g^3 + (2*d^4*f^3*log(e) - 6*c*d^3*f^2*g + 4*
c^2*d^2*f*g^2 - c^3*d*g^3)*b^4)*B^2*x + 6*(B^2*b^4*d^4*g^3*x^4 + 4*B^2*b^4*
d^4*f*g^2*x^3 + 6*B^2*b^4*d^4*f^2*g*x^2 + 4*B^2*b^4*d^4*f^3*x + (4*a*b^3*d^
4*f^3 - 6*a^2*b^2*d^4*f^2*g + 4*a^3*b*d^4*f*g^2 - a^4*d^4*g^3)*B^2)*log(b*x
 + a))*log(d*x + c))/(b^4*d^4)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(\frac{b^2ex^2 + 2\,abex + a}{d^2x^2 + 2\,cdx + c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*g^3
*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b^2*e*x^2 + 2*a*b*e*
x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x^2
+ 3*A*B*f^2*g*x + A*B*f^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2
*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**3*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(gx+f\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^3*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.273 $\int (f+gx)^2 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx$

Optimal. Leaf size=542

$$\frac{8B^2(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^3d^3}+\frac{4B(bc-ad)\left(a^2d^2g^2-abd\right.}{}$$

```
[Out] (4*B^2*(b*c - a*d)^2*g^2*x)/(3*b^2*d^2) - (4*B*(b*c - a*d)*g*(3*b*d*f - 2*b
*c*g - a*d*g)*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*b^3*d^
2) - (2*B*(b*c - a*d)*g^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]))/(3*b*d^3) - ((b*f - a*g)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)
/(3*b^3*g) + ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(3*g)
 + (4*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 -
 3*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[(b*c -
a*d)/(b*(c + d*x))])/(3*b^3*d^3) + (4*B^2*(b*c - a*d)^3*g^2*Log[(a + b*x)/(
c + d*x)])/(3*b^3*d^3) + (4*B^2*(b*c - a*d)^3*g^2*Log[c + d*x])/(3*b^3*d^3)
 + (8*B^2*(b*c - a*d)^2*g*(3*b*d*f - 2*b*c*g - a*d*g)*Log[c + d*x])/(3*b^3*
d^3) + (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2
*f^2 - 3*c*d*f*g + c^2*g^2))*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*b^
3*d^3)
```

Rubi [A] time = 1.19867, antiderivative size = 659, normalized size of antiderivative = 1.22, number of steps used = 29, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {2525, 12, 2528, 2486, 31, 72, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{8B^2(bf-ag)^3\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{3b^3g}-\frac{8B^2(df-cg)^3\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{3d^3g}+\frac{4a^2B^2g^2(bc-ad)\log(a+bx)}{3b^3d}-\frac{4ABgx(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (4*B^2*(b*c - a*d)^2*g^2*x)/(3*b^2*d^2) - (4*A*B*(b*c - a*d)*g*(3*b*d*f - b
*c*g - a*d*g)*x)/(3*b^2*d^2) + (4*a^2*B^2*(b*c - a*d)*g^2*Log[a + b*x])/(3*
b^3*d) + (4*B^2*(b*f - a*g)^3*Log[a + b*x]^2)/(3*b^3*g) - (4*B^2*(b*c - a*d
)*g*(3*b*d*f - b*c*g - a*d*g)*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(
3*b^3*d^2) - (2*B*(b*c - a*d)*g^2*x^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]))/(3*b*d) - (4*B*(b*f - a*g)^3*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(
c + d*x)^2]))/(3*b^3*g) + ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)
```

```
^2])^2)/(3*g) - (4*B^2*c^2*(b*c - a*d)*g^2*Log[c + d*x])/(3*b*d^3) + (8*B^2
*(b*c - a*d)^2*g*(3*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(3*b^3*d^3) - (8*B
^2*(d*f - c*g)^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*d^3*g)
+ (4*B*(d*f - c*g)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])
/(3*d^3*g) + (4*B^2*(d*f - c*g)^3*Log[c + d*x]^2)/(3*d^3*g) - (8*B^2*(b*f -
 a*g)^3*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*b^3*g) - (8*B^2*(b*
f - a*g)^3*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(3*b^3*g) - (8*B^2*(d*
f - c*g)^3*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(3*d^3*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{(2B)\int \frac{2(bc-ad)(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}\,dx}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{(4B(bc-ad))\int \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}}{3g}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{(4B(bc-ad))\int\left(\frac{g^2(3bdf-bcg-adg)\left(A+B\log\right.}{b^2d^2}\right.}{}$$

$$= \frac{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g} - \frac{\left(4B(bc-ad)g^2\right)\int x\left(A+B\log\left(\frac{e(a+bx)}{(c+dx)}\right.\right.}{3bd}$$

$$= -\frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{2B(bc-ad)g^2x^2\left(A+B\log\left(\frac{e(a+bx}{(c+dx)}\right.\right.}{3bd}$$

$$= -\frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{4B^2(bc-ad)g(3bdf-bcg-adg)(a}{3b^3d^2}$$

$$= -\frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} - \frac{4B^2(bc-ad)g(3bdf-bcg-adg)(a}{3b^3d^2}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc-ad)g}{3b^3}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc-ad)g}{3b^3}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc-ad)g}{3b^3}$$

$$= \frac{4B^2(bc-ad)^2g^2x}{3b^2d^2} - \frac{4AB(bc-ad)g(3bdf-bcg-adg)x}{3b^2d^2} + \frac{4a^2B^2(bc-ad)g}{3b^3}$$

Mathematica [A] time = 0.53153, size = 497, normalized size = 0.92

$$\frac{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{2B\left(2b^3B(df-cg)^3\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2Bd^3(bf-ag)^3\left(\log(a+bx)\left(\log(a\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] ((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (2*B*(2*A*b*d*(b*
c - a*d)*g^2*(3*b*d*f - b*c*g - a*d*g)*x + 2*B*d*(b*c - a*d)*g^2*(3*b*d*f -
 b*c*g - a*d*g)*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2] + b^2*d^2*(b*c -
 a*d)*g^3*x^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d^3*(b*f - a*g)^
3*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 4*B*(b*c - a*d)^2
*g^2*(-3*b*d*f + b*c*g + a*d*g)*Log[c + d*x] - 2*b^3*(d*f - c*g)^3*(A + B*L
og[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - 2*B*(b*c - a*d)*g^3*(a^2*d^
2*Log[a + b*x] - b*(d*(-(b*c) + a*d)*x + b*c^2*Log[c + d*x])) - 2*B*d^3*(b*
f - a*g)^3*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)])
- 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + 2*b^3*B*(d*f - c*g)^3*((2*L
og[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2
, (b*(c + d*x))/(b*c - a*d)])))/(b^3*d^3))/(3*g)
```

Maple [F] time = 1.569, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^2\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((g*x+f)^2*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 1.84261, size = 1968, normalized size = 3.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] 1/3*A^2*g^2*x^3 + A^2*f*g*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2
) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2))
+ 2*a*log(b*x + a)/b - 2*c*log(d*x + c)/d)*A*B*f^2 + 2*(x^2*log(b^2*e*x^2/(
d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2
*x^2 + 2*c*d*x + c^2)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 -
2*(b*c - a*d)*x/(b*d))*A*B*f*g + 2/3*(x^3*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x
+ c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c
^2)) + 2*a^3*log(b*x + a)/b^3 - 2*c^3*log(d*x + c)/d^3 - ((b^2*c*d - a*b*d^
2)*x^2 - 2*(b^2*c^2 - a^2*d^2)*x)/(b^2*d^2))*A*B*g^2 + A^2*f^2*x + 4/3*(2*a
^2*c*d^2*g^2 - (6*c*d^2*f*g - c^2*d*g^2)*a*b - (3*c*d^2*f^2*log(e) + (g^2*l
og(e) + 3*g^2)*c^3 - 3*(f*g*log(e) + 2*f*g)*c^2*d)*b^2)*B^2*log(d*x + c)/(b
^2*d^3) + 8/3*(3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g^2 - (3*c*d^2*f
^2 - 3*c^2*d*f*g + c^3*g^2)*b^3)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d
) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^3*d^3) + 1/3*(B^2*b^3*d^
3*g^2*x^3*log(e)^2 + (2*a*b^2*d^3*g^2*log(e) + (3*d^3*f*g*log(e)^2 - 2*c*d^
2*g^2*log(e))*b^3)*B^2*x^2 - (4*(g^2*log(e) - g^2)*a^2*b*d^3 - 4*(3*d^3*f*g
*log(e) - 2*c*d^2*g^2)*a*b^2 - (3*d^3*f^2*log(e)^2 - 12*c*d^2*f*g*log(e) +
4*(g^2*log(e) + g^2)*c^2*d)*b^3)*B^2*x + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3
*d^3*f*g*x^2 + 3*B^2*b^3*d^3*f^2*x + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a
^3*d^3*g^2)*B^2)*log(b*x + a)^2 + 4*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*
g*x^2 + 3*B^2*b^3*d^3*f^2*x + (3*c*d^2*f^2 - 3*c^2*d*f*g + c^3*g^2)*B^2*b^3
)*log(d*x + c)^2 + 4*(B^2*b^3*d^3*g^2*x^3*log(e) + (a*b^2*d^3*g^2 + (3*d^3*
f*g*log(e) - c*d^2*g^2)*b^3)*B^2*x^2 + (6*a*b^2*d^3*f*g - 2*a^2*b*d^3*g^2 +
 (3*d^3*f^2*log(e) - 6*c*d^2*f*g + 2*c^2*d*g^2)*b^3)*B^2*x + ((g^2*log(e) -
 3*g^2)*a^3*d^3 + (c*d^2*g^2 - 3*(f*g*log(e) - 2*f*g)*d^3)*a^2*b + (3*d^3*f
^2*log(e) - 6*c*d^2*f*g + 2*c^2*d*g^2)*a*b^2)*B^2)*log(b*x + a) - 4*(B^2*b^
3*d^3*g^2*x^3*log(e) + (a*b^2*d^3*g^2 + (3*d^3*f*g*log(e) - c*d^2*g^2)*b^3)
*B^2*x^2 + (6*a*b^2*d^3*f*g - 2*a^2*b*d^3*g^2 + (3*d^3*f^2*log(e) - 6*c*d^2
*f*g + 2*c^2*d*g^2)*b^3)*B^2*x + 2*(B^2*b^3*d^3*g^2*x^3 + 3*B^2*b^3*d^3*f*g
*x^2 + 3*B^2*b^3*d^3*f^2*x + (3*a*b^2*d^3*f^2 - 3*a^2*b*d^3*f*g + a^3*d^3*g
^2)*B^2)*log(b*x + a))*log(d*x + c))/(b^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2g^2x^2 + 2\,A^2fgx + A^2f^2 + \left(B^2g^2x^2 + 2\,B^2fgx + B^2f^2\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 + 2\left(ABg^2x^2 + 2\,ABfg\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*x +
 B^2*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2
+ 2*(A*B*g^2*x^2 + 2*A*B*f*g*x + A*B*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*
e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)^2 \left(B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.274 $\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=281

$$\frac{4B^2(bc-ad)(-adg-bcg+2bdf)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2d^2}+\frac{2B(bc-ad)(-adg-bcg+2bdf)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{b^2d^2}$$

```
[Out] (-2*B*(b*c - a*d)*g*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(b^
2*d) - ((b*f - a*g)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(2*b^2*g)
 + ((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(2*g) + (2*B*(b
*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]
)*Log[(b*c - a*d)/(b*(c + d*x))])/(b^2*d^2) + (4*B^2*(b*c - a*d)^2*g*Log[c
+ d*x])/(b^2*d^2) + (4*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(b^2*d^2)
```

Rubi [A] time = 0.959411, antiderivative size = 450, normalized size of antiderivative = 1.6, number of steps used = 25, number of rules used = 12, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.414, Rules used = {2525, 12, 2528, 2486, 31, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$-\frac{4B^2(bf-ag)^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b^2g}-\frac{4B^2(df-cg)^2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d^2g}-\frac{2B(bf-ag)^2\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right.}{b^2g}$$

Antiderivative was successfully verified.

```
[In] Int[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*g*x)/(b*d) + (2*B^2*(b*f - a*g)^2*Log[a + b*x]^2)/(b^2*
g) - (2*B^2*(b*c - a*d)*g*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^2])/(b^2*
d) - (2*B*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2
]))/(b^2*g) + ((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/(2*g
) + (4*B^2*(b*c - a*d)^2*g*Log[c + d*x])/(b^2*d^2) - (4*B^2*(d*f - c*g)^2*L
og[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(d^2*g) + (2*B*(d*f - c*g)^2
*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(d^2*g) + (2*B^2*(d
*f - c*g)^2*Log[c + d*x]^2)/(d^2*g) - (4*B^2*(b*f - a*g)^2*Log[a + b*x]*Log
[(b*(c + d*x))/(b*c - a*d)])/(b^2*g) - (4*B^2*(b*f - a*g)^2*PolyLog[2, -((d
*(a + b*x))/(b*c - a*d))])/(b^2*g) - (4*B^2*(d*f - c*g)^2*PolyLog[2, (b*(c
+ d*x))/(b*c - a*d)])/(d^2*g)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

RFx, x] && IntegerQ[p]

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int (f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{B\int \frac{2(bc-ad)(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{(2B(bc-ad))\int \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx}{g}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{(2B(bc-ad))\int\left(\frac{g^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{bd} + \frac{(bf-\cdots}{\cdots}\right.}{\cdots}$$

$$= \frac{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g} - \frac{(2B(bc-ad)g)\int\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)d\cdots}{bd}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B(bf-ag)^2\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b^2g} + \frac{(f+g\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf-ag)^2\log(\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf-ag)^2\log(\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf-ag)^2\log(\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)gx}{bd} - \frac{2B^2(bc-ad)g(a+bx)\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{b^2d} - \frac{2B(bf-ag)^2\log(\cdots}{\cdots}$$

$$= -\frac{2AB(bc-ad)gx}{bd} + \frac{2B^2(bf-ag)^2\log^2(a+bx)}{b^2g} - \frac{2B^2(bc-ad)g(a+bx)\log\cdots}{b^2d}$$

$$= -\frac{2AB(bc-ad)gx}{bd} + \frac{2B^2(bf-ag)^2\log^2(a+bx)}{b^2g} - \frac{2B^2(bc-ad)g(a+bx)\log\cdots}{b^2d}$$

Mathematica [A] time = 0.306174, size = 351, normalized size = 1.25

$$(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2-\frac{4B\left(b^2B(df-cg)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-Bd^2(bf-ag)^2\left(\log(a+bx)\left(\log(a\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] ((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 - (4*B*(A*b*d*(b*c
- a*d)*g^2*x + B*d*(b*c - a*d)*g^2*(a + b*x)*Log[(e*(a + b*x)^2)/(c + d*x)^
2] + d^2*(b*f - a*g)^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]
) - 2*B*(b*c - a*d)^2*g^2*Log[c + d*x] - b^2*(d*f - c*g)^2*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - B*d^2*(b*f - a*g)^2*(Log[a + b*x]*(
Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x
))/(-(b*c) + a*d)]) + b^2*B*(d*f - c*g)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a
*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]
)))/(b^2*d^2))/(2*g)
```

Maple [F] time = 1.416, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((g*x+f)*(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [B] time = 1.59674, size = 1061, normalized size = 3.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] 1/2*A^2*g*x^2 + 2*(x*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d
^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2)) + 2*a*log(b*x +
a)/b - 2*c*log(d*x + c)/d)*A*B*f + (x^2*log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x +
c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^2
)) - 2*a^2*log(b*x + a)/b^2 + 2*c^2*log(d*x + c)/d^2 - 2*(b*c - a*d)*x/(b*d
))*A*B*g + A^2*f*x - 2*(2*a*c*d*g + (2*c*d*f*log(e) - (g*log(e) + 2*g)*c^2)
*b)*B^2*log(d*x + c)/(b*d^2) + 4*(2*a*b*d^2*f - a^2*d^2*g - (2*c*d*f - c^2*
g)*b^2)*(log(b*x + a)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x +
a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/2*(B^2*b^2*d^2*g*x^2*log(e)^2 + 2*(2*a
*b*d^2*g*log(e) + (d^2*f*log(e)^2 - 2*c*d*g*log(e))*b^2)*B^2*x + 4*(B^2*b^2
*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x + (2*a*b*d^2*f - a^2*d^2*g)*B^2)*log(b*x + a
)^2 + 4*(B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x + (2*c*d*f - c^2*g)*B^2*b^2)
*log(d*x + c)^2 + 4*(B^2*b^2*d^2*g*x^2*log(e) + 2*(a*b*d^2*g + (d^2*f*log(e
) - c*d*g)*b^2)*B^2*x - ((g*log(e) - 2*g)*a^2*d^2 - 2*(d^2*f*log(e) - c*d*g
)*a*b)*B^2)*log(b*x + a) - 4*(B^2*b^2*d^2*g*x^2*log(e) + 2*(a*b*d^2*g + (d^
2*f*log(e) - c*d*g)*b^2)*B^2*x + 2*(B^2*b^2*d^2*g*x^2 + 2*B^2*b^2*d^2*f*x +
 (2*a*b*d^2*f - a^2*d^2*g)*B^2)*log(b*x + a))*log(d*x + c))/(b^2*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2gx + A^2f + \left(B^2gx + B^2f\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right)^2 + 2\left(ABgx + ABf\right)\log\left(\frac{b^2ex^2 + 2\,abex + a^2e}{d^2x^2 + 2\,cdx + c^2}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b^2*e*x^2 + 2*a*b*e*x + a
^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g*x + A*B*f)*log((b^2*e*x^2 + 2
*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (gx+f)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.275 $\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\,dx$

Optimal. Leaf size=129

$$\frac{8B^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{4B(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{bd}+\frac{(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{b}$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/b + (4*B*(b*c - a*d)
*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[(b*c - a*d)/(b*(c + d*x))])/(
b*d) + (8*B^2*(b*c - a*d)*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d)
```

Rubi [A] time = 0.773903, antiderivative size = 252, normalized size of antiderivative = 1.95, number of steps used = 22, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2523, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{8aB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{b}+\frac{8B^2c\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{d}+\frac{4aB\log(a+bx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{b}-\frac{4Bc\log(c+dx)\left(B\log\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] (-4*a*B^2*Log[a + b*x]^2)/b + (4*a*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2
)/(c + d*x)^2]))/b + x*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (8*B^2*
c*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/d - (4*B*c*(A + B*Log[(e*
(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/d - (4*B^2*c*Log[c + d*x]^2)/d + (
8*a*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/b + (8*a*B^2*PolyLog[2
, -((d*(a + b*x))/(b*c - a*d))])/b + (8*B^2*c*PolyLog[2, (b*(c + d*x))/(b*c
 - a*d)])/d
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 dx = x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - (2B)\int \frac{2(bc-ad)x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - (4B(bc-ad))\int \frac{x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)}dx$$

$$= x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - (4B(bc-ad))\int \left(-\frac{a\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(a+bx)} + \frac{c\left(A+\right.}{(bc\ }\right.$$

$$= x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 + (4aB)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}dx - (4Bc)\int \frac{A+B\log}{c+}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(A+B\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(A+B\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(A+B\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 - \frac{4Bc\left(A+B\right.}{}$$

$$= \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2 + \frac{8B^2c\log\left(-\right.}{}$$

$$= -\frac{4aB^2\log^2(a+bx)}{b} + \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.$$

$$= -\frac{4aB^2\log^2(a+bx)}{b} + \frac{4aB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{b} + x\left(A+B\log\left(\frac{e(a+}{(c+}\right.\right.$$

Mathematica [A] time = 0.162735, size = 220, normalized size = 1.71

$$\frac{4B\left(-aBd\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+bBc\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+\right.\right.}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] x*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (4*B*(a*d*Log[a + b*x]*(A +
B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - b*c*(A + B*Log[(e*(a + b*x)^2)/(c + d
*x)^2])*Log[c + d*x] - a*B*d*(Log[a + b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*
x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)]) + b*B*c*((2
*Log[(d*(a + b*x))/(-(b*c) + a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog
[2, (b*(c + d*x))/(b*c - a*d)])))/(b*d)
```

Maple [F] time = 1.319, size = 0, normalized size = 0.

$$\int \left(A+B\ln\left(\frac{e\,(bx+a)^{2}}{(dx+c)^{2}}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\left(x\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+\frac{2\left(\frac{ae\log(bx+a)}{b}-\frac{ce\log(dx+c)}{d}\right)}{e}\right)AB+A^{2}x+B^{2}\left(\frac{4\left(bdx\log\left(bx+a\right)^{2}+(bdx+bc)\log\left(dx+c\right)^{2}-(bdx\right.}{bd}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] 2*(x*log((b*x + a)^2*e/(d*x + c)^2) + 2*(a*e*log(b*x + a)/b - c*e*log(d*x +
 c)/d)/e)*A*B + A^2*x + B^2*(4*(b*d*x*log(b*x + a)^2 + (b*d*x + b*c)*log(d*
x + c)^2 - (b*d*x*log(e) + 2*(b*d*x + a*d)*log(b*x + a))*log(d*x + c))/(b*d
) + integrate(((log(e)^2 + 4*log(e))*b^2*d*x^2 + a*b*c*log(e)^2 + (b^2*c*lo
g(e)^2 + (log(e)^2 + 4*log(e))*a*b*d)*x + 4*(b^2*d*x^2*log(e) + a*b*c*log(e
) + 2*a^2*d + (a*b*d*(log(e) + 4) + b^2*c*(log(e) - 2))*x)*log(b*x + a))/(b
^2*d*x^2 + a*b*c + (b^2*c + a*b*d)*x), x))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)) +
 A^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.276 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{f+gx}\,dx$

Optimal. Leaf size=285

$$\frac{4B\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}-\frac{4B\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{g}-\frac{8B^2\text{PolyLog}\left(3,\frac{(a}{(c}\right.}{g}$$

```
[Out] -(((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2*Log[(b*c - a*d)/(b*(c + d*x))
])/g) + ((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2*Log[1 - ((d*f - c*g)*(a
 + b*x))/((b*f - a*g)*(c + d*x))])/g - (4*B*(A + B*Log[(e*(a + b*x)^2)/(c +
 d*x)^2])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/g + (4*B*(A + B*Log[(e*(
a + b*x)^2)/(c + d*x)^2])*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(
c + d*x))])/g + (8*B^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/g - (8*B^2*
PolyLog[3, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/g
```

Rubi [B] time = 5.84608, antiderivative size = 2126, normalized size of antiderivative = 7.46, number of steps used = 44, number of rules used = 21, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.677, Rules used = {2524, 12, 2528, 2418, 2390, 2301, 2394, 2393, 2391, 6688, 6742, 2500, 2433, 2375, 2317, 2374, 6589, 2440, 2437, 2435, 2315}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x),x]
```

```
[Out] (-4*A*B*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/g - (B^2*Log[(a + b
*x)^2]^2*Log[f + g*x])/g - (B^2*Log[(c + d*x)^(-2)]^2*Log[f + g*x])/g + (4*
B^2*Log[-((g*(a + b*x))/(b*f - a*g))]*(Log[(a + b*x)^2] + Log[(c + d*x)^(-2
)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/g + ((A + B*Log[(e*(a
+ b*x)^2)/(c + d*x)^2])^2*Log[f + g*x])/g + (8*B^2*Log[-((d*(a + b*x))/(b*c
 - a*d))]*Log[c + d*x]*Log[f + g*x])/g - (4*B^2*Log[-((g*(a + b*x))/(b*f -
a*g))]*(Log[(c + d*x)^(-2)] + 2*Log[c + d*x])*Log[f + g*x])/g + (8*B^2*Log[
a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)]*Log[f + g*x])/g + (4*A*B*Log[-((g*(
c + d*x))/(d*f - c*g))]*Log[f + g*x])/g - (4*B^2*(2*Log[a + b*x] - Log[(a +
 b*x)^2])*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g - (4*B^2*(Log[(
a + b*x)^2] + Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[-
((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/g + (B^2*Log[(a + b*x)^2]^2*Log[
```

```
(b*(f + g*x))/(b*f - a*g)])/g + (B^2*Log[(c + d*x)^(-2)]^2*Log[(d*(f + g*x)
)/(d*f - c*g)])/g + (4*B^2*(Log[(b*(c + d*x))/(b*c - a*d)] + Log[(b*f - a*g
)/(b*(f + g*x))] - Log[((b*f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])*Lo
g[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]^2)/g - (4*B^2*(Log[(b
*(c + d*x))/(b*c - a*d)] - Log[-((g*(c + d*x))/(d*f - c*g))])*(Log[a + b*x]
 + Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])^2)/g + (4*B^2*(
Log[-((d*(a + b*x))/(b*c - a*d))] + Log[(d*f - c*g)/(d*(f + g*x))] - Log[-(
((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])*Log[((b*c - a*d)*(f + g*
x))/((b*f - a*g)*(c + d*x))]^2)/g - (4*B^2*(Log[-((d*(a + b*x))/(b*c - a*d)
)] - Log[-((g*(a + b*x))/(b*f - a*g))])*(Log[c + d*x] + Log[((b*c - a*d)*(f
 + g*x))/((b*f - a*g)*(c + d*x))])^2)/g + (8*B^2*(Log[f + g*x] - Log[-(((b*
c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, -((d*(a + b*x))/(
b*c - a*d))])/g + (4*B^2*Log[(a + b*x)^2]*PolyLog[2, -((g*(a + b*x))/(b*f -
 a*g))])/g + (8*B^2*(Log[f + g*x] - Log[((b*c - a*d)*(f + g*x))/((b*f - a*g
)*(c + d*x))])*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/g - (4*B^2*Log[(c + d
*x)^(-2)]*PolyLog[2, -((g*(c + d*x))/(d*f - c*g))])/g - (8*B^2*Log[-(((b*c
- a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))]*PolyLog[2, (g*(a + b*x))/(b*(f
+ g*x))])/g + (8*B^2*Log[-(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))
]*PolyLog[2, -(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (8*B^
2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))]*PolyLog[2, (g*(c + d
*x))/(d*(f + g*x))])/g + (8*B^2*Log[((b*c - a*d)*(f + g*x))/((b*f - a*g)*(c
 + d*x))]*PolyLog[2, ((b*f - a*g)*(c + d*x))/((b*c - a*d)*(f + g*x))])/g -
(4*A*B*PolyLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (4*B^2*(Log[(a + b*x)^2]
+ Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^2])*PolyLog[2, (b*(f
+ g*x))/(b*f - a*g)])/g - (4*B^2*(Log[(c + d*x)^(-2)] + 2*Log[c + d*x])*Pol
yLog[2, (b*(f + g*x))/(b*f - a*g)])/g + (8*B^2*(Log[c + d*x] + Log[((b*c -
a*d)*(f + g*x))/((b*f - a*g)*(c + d*x))])*PolyLog[2, (b*(f + g*x))/(b*f - a
*g)])/g + (4*A*B*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (4*B^2*(2*Log[a
 + b*x] - Log[(a + b*x)^2])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g - (4*B
^2*(Log[(a + b*x)^2] + Log[(c + d*x)^(-2)] - Log[(e*(a + b*x)^2)/(c + d*x)^
2])*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/g + (8*B^2*(Log[a + b*x] + Log[-
(((b*c - a*d)*(f + g*x))/((d*f - c*g)*(a + b*x)))])*PolyLog[2, (d*(f + g*x)
)/(d*f - c*g)])/g - (8*B^2*PolyLog[3, -((d*(a + b*x))/(b*c - a*d))])/g - (8
*B^2*PolyLog[3, -((g*(a + b*x))/(b*f - a*g))])/g - (8*B^2*PolyLog[3, (b*(c
+ d*x))/(b*c - a*d)])/g - (8*B^2*PolyLog[3, -((g*(c + d*x))/(d*f - c*g))])/
g - (8*B^2*PolyLog[3, (g*(a + b*x))/(b*(f + g*x))])/g + (8*B^2*PolyLog[3, -
(((d*f - c*g)*(a + b*x))/((b*c - a*d)*(f + g*x)))])/g - (8*B^2*PolyLog[3, (
g*(c + d*x))/(d*(f + g*x))])/g + (8*B^2*PolyLog[3, ((b*f - a*g)*(c + d*x))/
((b*c - a*d)*(f + g*x))])/g - (8*B^2*PolyLog[3, (b*(f + g*x))/(b*f - a*g)])
/g - (8*B^2*PolyLog[3, (d*(f + g*x))/(d*f - c*g)])/g
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
```

```
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

```
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2500

```
Int[(Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.)
)^(r_.)]*((s_.) + Log[(i_.)*((g_.) + (h_.)*(x_))^(n_.)]*(t_.)))/((j_.) + (k
_.)*(x_)), x_Symbol] :> Dist[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r] - Log[(a
+ b*x)^(p*r)] - Log[(c + d*x)^(q*r)], Int[(s + t*Log[i*(g + h*x)^n])/(j + k
*x), x], x] + (Int[(Log[(a + b*x)^(p*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k
*x), x] + Int[(Log[(c + d*x)^(q*r)]*(s + t*Log[i*(g + h*x)^n]))/(j + k*x),
x]) /; FreeQ[{a, b, c, d, e, f, g, h, i, j, k, s, t, n, p, q, r}, x] && NeQ
[b*c - a*d, 0]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 2375

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))^(r_.)]*((a_.) + Log[(c_.)*(x_)^(n_
.)]*(b_.))^(p_.))/(x_), x_Symbol] :> Simp[(Log[d*(e + f*x^m)^r]*(a + b*Log[
c*x^n])^(p + 1))/(b*n*(p + 1)), x] - Dist[(f*m*r)/(b*n*(p + 1)), Int[(x^(m
- 1)*(a + b*Log[c*x^n])^(p + 1))/(e + f*x^m), x], x] /; FreeQ[{a, b, c, d,
e, f, r, m, n}, x] && IGtQ[p, 0] && NeQ[d*e, 1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2440

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + Log[(h_.)
*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_) + (l_.)*(x_))^(r_.), x_Symbol] :>
 Dist[1/l, Subst[Int[x^r*(a + b*Log[c*(-((e*k - d*l)/l) + (e*x)/l)^n])*(f +
 g*Log[h*(-((j*k - i*l)/l) + (j*x)/l)^m]), x], x, k + l*x], x] /; FreeQ[{a,
 b, c, d, e, f, g, h, i, j, k, l, m, n}, x] && IntegerQ[r]
```

Rule 2437

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*Log[(h_.)*((i_.) + (j_.)*(x_))^(m
_.)])/(x_), x_Symbol] :> Dist[m, Int[(Log[i + j*x]*Log[c*(d + e*x)^n])/x, x
], x] - Dist[m*Log[i + j*x] - Log[h*(i + j*x)^m], Int[Log[c*(d + e*x)^n]/x,
 x], x] /; FreeQ[{c, d, e, h, i, j, m, n}, x] && NeQ[e*i - d*j, 0] && NeQ[i
 + j*x, h*(i + j*x)^m]
```

Rule 2435

```
Int[(Log[(a_) + (b_.)*(x_)]*Log[(c_) + (d_.)*(x_)])/(x_), x_Symbol] :> Simp
[Log[-((b*x)/a)]*Log[a + b*x]*Log[c + d*x], x] + (Simp[(1*(Log[-((b*x)/a)]
- Log[-(((b*c - a*d)*x)/(a*(c + d*x)))] + Log[(b*c - a*d)/(b*(c + d*x))])*L
og[(a*(c + d*x))/(c*(a + b*x))]^2)/2, x] - Simp[(1*(Log[-((b*x)/a)] - Log[-
((d*x)/c)])*(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])^2)/2, x] + Si
mp[(Log[c + d*x] - Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1 + (b*x)/a
```

```
], x] + Simp[(Log[a + b*x] + Log[(a*(c + d*x))/(c*(a + b*x))])*PolyLog[2, 1
 + (d*x)/c], x] + Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2, (c*(a +
b*x))/(a*(c + d*x))], x] - Simp[Log[(a*(c + d*x))/(c*(a + b*x))]*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))], x] - Simp[PolyLog[3, 1 + (b*x)/a], x] - Simp
[PolyLog[3, 1 + (d*x)/c], x] + Simp[PolyLog[3, (c*(a + b*x))/(a*(c + d*x))]
, x] - Simp[PolyLog[3, (d*(a + b*x))/(b*(c + d*x))], x]) /; FreeQ[{a, b, c,
 d}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{f+gx}\,dx = \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(\cdots}{e(a+bx)^2}}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{(c+dx)^2\left(-\frac{2de(a+bx)^2}{(c+dx)^3}+\frac{2be(a+bx)}{(c+dx)^2}\right)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(\cdots}{(a+bx)^2}}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(2B)\int \frac{2(bc-ad)e\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{eg}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4B(bc-ad))\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{(a+bx)(c+dx)}\,dx}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4B(bc-ad))\int \left(\frac{b\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{(bc-ad)(a+bx)} - \frac{d\left(A+B\cdots\right.}{\cdots}\right.}{g}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4bB)\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(f+gx)}{a+bx}\,dx}{g} + \frac{(4Bd)\int \frac{\left(A+\cdots\right.}{\cdots}}{\cdots}$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4bB)\int \left(\frac{A\log(f+gx)}{a+bx} + \frac{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\log(f+gx)}{a+bx}\right)dx}{g} + \cdots$$

$$= \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} - \frac{(4AbB)\int \frac{\log(f+gx)}{a+bx}\,dx}{g} - \frac{\left(4bB^2\right)\int \frac{\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\log(f+\cdots}{a+bx}}{g}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2\log(f+gx)}{g} + \frac{4AB\log\left(-\frac{g(c\cdots}{df\cdots}\right.}{\cdots}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} + \frac{4B^2\log\left(-\frac{g(a+bx)}{bf-ag}\right)\left(\log\left((a+bx)^2\right)+\log\left(\frac{1}{(c+dx)^2}\right)-\cdots\right.}{g}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^2\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{(c+dx)^2}\right)\cdots}{g}$$

$$= -\frac{4AB\log\left(-\frac{g(a+bx)}{bf-ag}\right)\log(f+gx)}{g} - \frac{B^2\log^2\left((a+bx)^2\right)\log(f+gx)}{g} - \frac{B^2\log^2\left(\frac{1}{(c+dx)^2}\right)\cdots}{g}$$

Mathematica [F] time = 2.19976, size = 0, normalized size = 0.

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{f+gx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x), x]
```

Maple [F] time = 1.629, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{A^2\log\left(gx+f\right)}{g}-\int -\frac{4\,B^2\log\left(bx+a\right)^2+B^2\log\left(e\right)^2+2\,AB\log\left(e\right)+4\left(B^2\log\left(e\right)+AB\right)\log\left(bx+a\right)-4\left(2\,B^2\log\left(bx\right.\right.}{gx+f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x, algorithm="maxima")
```

```
[Out] A^2*log(g*x + f)/g - integrate(-(4*B^2*log(b*x + a)^2 + B^2*log(e)^2 + 2*A*
B*log(e) + 4*(B^2*log(e) + A*B)*log(b*x + a) - 4*(2*B^2*log(b*x + a) + B^2*
log(e) + A*B)*log(d*x + c))/(g*x + f), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{gx+f},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x, algorithm="fricas")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g*x + f), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{gx+f}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f), x)
```

3.277 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^2}\,dx$

Optimal. Leaf size=200

$$\frac{8B^2(bc-ad)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{(bf-ag)(df-cg)}+\frac{4B(bc-ad)\log\left(1-\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)}{(bf-ag)(df-cg)}+\frac{(a+bx)\left(B\log\left(\frac{e(a}{(c}\right.\right.}{(f+gx)(bf}$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2)/((b*f - a*g)*(f + g*
x)) + (4*B*(b*c - a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[1 - ((d
*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b*f - a*g)*(d*f - c*g)) +
(8*B^2*(b*c - a*d)*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x
))])/((b*f - a*g)*(d*f - c*g))
```

Rubi [B] time = 1.30136, antiderivative size = 620, normalized size of antiderivative = 3.1, number of steps used = 32, number of rules used = 10, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.323, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391}

$$\frac{8bB^2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)}{g(bf-ag)}+\frac{8B^2d\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)}{g(df-cg)}-\frac{8B^2(bc-ad)\text{PolyLog}\left(2,\frac{b(f+gx)}{bf-ag}\right)}{(bf-ag)(df-cg)}+\frac{8B^2(bc-ad)\text{PolyLog}\left(\right.}{(bf-ag)(df-}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^2,x]
```

```
[Out] (-4*b*B^2*Log[a + b*x]^2)/(g*(b*f - a*g)) + (4*b*B*Log[a + b*x]*(A + B*Log[
(e*(a + b*x)^2)/(c + d*x)^2]))/(g*(b*f - a*g)) - (A + B*Log[(e*(a + b*x)^2)
/(c + d*x)^2])^2/(g*(f + g*x)) + (8*B^2*d*Log[-((d*(a + b*x))/(b*c - a*d))]
*Log[c + d*x])/(g*(d*f - c*g)) - (4*B*d*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2])*Log[c + d*x])/(g*(d*f - c*g)) - (4*B^2*d*Log[c + d*x]^2)/(g*(d*f - c*
g)) + (8*b*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g))
 - (8*B^2*(b*c - a*d)*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f
 - a*g)*(d*f - c*g)) + (4*B*(b*c - a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2])*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (8*B^2*(b*c - a*d)*Log[-((g
*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)*(d*f - c*g)) + (8*b*B^
2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f - a*g)) + (8*B^2*d*Poly
Log[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*g)) - (8*B^2*(b*c - a*d)*Pol
yLog[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)*(d*f - c*g)) + (8*B^2*(b*c
```

```
 - a*d)*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/((b*f - a*g)*(d*f - c*g))
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^2}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{(4B(bc-ad))\int \left(\frac{b^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)(a+bx)} + \frac{d^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(-df+cg)(c+dx)} + \frac{g^2 \cdots}{(b \cdots} \cdots\right.}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{\left(4b^2B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{g(bf-ag)} - \frac{\left(4Bd^2\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{c+dx}\,dx}{g(df-cg)} + \cdots$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\log\left(\frac{e(a+b \cdots}{(c+d \cdots}\right.\right.}{g(df-c \cdots}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\log\left(\frac{e(a+b \cdots}{(c+d \cdots}\right.\right.}{g(df-c \cdots}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\log\left(\frac{e(a+b \cdots}{(c+d \cdots}\right.\right.}{g(df-c \cdots}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} - \frac{4Bd\left(A+B\log\left(\frac{e(a+b \cdots}{(c+d \cdots}\right.\right.}{g(df-c \cdots}$$

$$= \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \frac{8B^2d\log\left(-\frac{d(a+bx)}{bc-ad}\right)\log \cdots}{g(df-cg)}$$

$$= -\frac{4bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \cdots$$

$$= -\frac{4bB^2\log^2(a+bx)}{g(bf-ag)} + \frac{4bB\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)} - \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{g(f+gx)} + \cdots$$

Mathematica [B] time = 0.852957, size = 409, normalized size = 2.04

$$\frac{4B\left(-bB(df-cg)\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)+Bd(bf-ag)\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\right)-2B\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^2,x]
```

```
[Out] (-((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)) + (4*B*(b*(d*f - c
*g)*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - d*(b*f - a*g)*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] + (b*c - a*d)*g*(A + B
*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x] - b*B*(d*f - c*g)*(Log[a +
b*x]*(Log[a + b*x] - 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)]) + B*d*(b*f - a*g)*((2*Log[(d*(a + b*x))/(-(b*c) +
 a*d)] - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)]) - 2*B*(b*c - a*d)*g*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[(g*(c + d
*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)]
- PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)*(d*f - c*g)))/g
```

Maple [F] time = 1.794, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,AB\left(\frac{2\,b\log\left(bx+a\right)}{bfg-ag^{2}}-\frac{2\,d\log\left(dx+c\right)}{dfg-cg^{2}}+\frac{2\,(bc-ad)\log\left(gx+f\right)}{bdf^{2}+acg^{2}-(bc+ad)fg}-\frac{\log\left(\frac{b^{2}ex^{2}}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{2\,abex}{d^{2}x^{2}+2\,cdx+c^{2}}+\frac{a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)}{g^{2}x+fg}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x, algorithm="maxima
")
```

```
[Out] 2*A*B*(2*b*log(b*x + a)/(b*f*g - a*g^2) - 2*d*log(d*x + c)/(d*f*g - c*g^2)
+ 2*(b*c - a*d)*log(g*x + f)/(b*d*f^2 + a*c*g^2 - (b*c + a*d)*f*g) - log(b^
2*e*x^2/(d^2*x^2 + 2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a
^2*e/(d^2*x^2 + 2*c*d*x + c^2))/(g^2*x + f*g)) - B^2*(4*log(d*x + c)^2/(g^2
*x + f*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + 4*(d*g*x + c*g)*log
(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 4*((g*log(e) - 2
*g)*d*x + c*g*log(e) - 2*d*f + 2*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/
(d*g^3*x^3 + c*f^2*g + (2*d*f*g^2 + c*g^3)*x^2 + (d*f^2*g + 2*c*f*g^2)*x),
x)) - A^2/(g^2*x + f*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{g^2x^2+2\,fgx+f^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^2*x^2 + 2*f*g*x + f^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**2,x)
```

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{(gx+f)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^2, x)
```

3.278 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^3}\,dx$

Optimal. Leaf size=381

$$\frac{4B^2(bc-ad)(-adg-bcg+2bdf)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{(bf-ag)^2(df-cg)^2}+\frac{b^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2}{2g(bf-ag)^2}+\frac{2Bg(a+bx)(bc-ad)\left(B\log\left(\right.\right.}{(f+gx)(bf-ag)^2(df}$$

```
[Out] (2*B*(b*c - a*d)*g*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*
f - a*g)^2*(d*f - c*g)*(f + g*x)) + (b^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*
x)^2])^2)/(2*g*(b*f - a*g)^2) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/
(2*g*(f + g*x)^2) + (4*B^2*(b*c - a*d)^2*g*Log[(f + g*x)/(c + d*x)])/((b*f
- a*g)^2*(d*f - c*g)^2) + (2*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B
*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[1 - ((d*f - c*g)*(a + b*x))/((b*f -
a*g)*(c + d*x))])/((b*f - a*g)^2*(d*f - c*g)^2) + (4*B^2*(b*c - a*d)*(2*b*d
*f - b*c*g - a*d*g)*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*
x))])/((b*f - a*g)^2*(d*f - c*g)^2)
```

Rubi [B] time = 1.64416, antiderivative size = 899, normalized size of antiderivative = 2.36, number of steps used = 36, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{2B^2\log^2(a+bx)b^2}{g(bf-ag)^2}+\frac{2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)b^2}{g(bf-ag)^2}+\frac{4B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^2}{g(bf-ag)^2}+\frac{4B^2\text{PolyLog}\left(2,-\frac{d(}{b}\right.}{g(bf-ag)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^3,x]
```

```
[Out] (4*b*B^2*(b*c - a*d)*Log[a + b*x])/((b*f - a*g)^2*(d*f - c*g)) - (2*b^2*B^2
*Log[a + b*x]^2)/(g*(b*f - a*g)^2) - (2*B*(b*c - a*d)*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2]))/((b*f - a*g)*(d*f - c*g)*(f + g*x)) + (2*b^2*B*Log[a +
 b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(g*(b*f - a*g)^2) - (A + B*
Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(2*g*(f + g*x)^2) - (4*B^2*d*(b*c - a*d
)*Log[c + d*x])/((b*f - a*g)*(d*f - c*g)^2) + (4*B^2*d^2*Log[-((d*(a + b*x)
)/(b*c - a*d))]*Log[c + d*x])/(g*(d*f - c*g)^2) - (2*B*d^2*(A + B*Log[(e*(a
 + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(g*(d*f - c*g)^2) - (2*B^2*d^2*Log[c
 + d*x]^2)/(g*(d*f - c*g)^2) + (4*b^2*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b
*c - a*d)])/(g*(b*f - a*g)^2) + (4*B^2*(b*c - a*d)^2*g*Log[f + g*x])/((b*f
```

```
- a*g)^2*(d*f - c*g)^2) - (4*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[
-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) +
 (2*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^2)/(c +
 d*x)^2])*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2) + (4*B^2*(b*c - a*d)*
(2*b*d*f - b*c*g - a*d*g)*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(
(b*f - a*g)^2*(d*f - c*g)^2) + (4*b^2*B^2*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))])/(g*(b*f - a*g)^2) + (4*B^2*d^2*PolyLog[2, (b*(c + d*x))/(b*c - a*d
)])/(g*(d*f - c*g)^2) - (4*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLo
g[2, (b*(f + g*x))/(b*f - a*g)])/((b*f - a*g)^2*(d*f - c*g)^2) + (4*B^2*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/(
(b*f - a*g)^2*(d*f - c*g)^2)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
```

```
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^3}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2} + \frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2} + \frac{(2B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)^2}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2} + \frac{(2B(bc-ad))\int \left(\frac{b^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)^2(a+bx)} - \frac{d^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(-df+cg)^2(c+dx)} + \cdots}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{2g(f+gx)^2} + \frac{\left(2b^3B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{g(bf-ag)^2} - \frac{\left(2Bd^3\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{c+dx}\,dx}{g(df-cg)^2} + \cdots$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{2b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)^2} - \frac{\left(A+\cdots\right.}{2\cdots}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{2b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)^2} - \frac{\left(A+\cdots\right.}{2\cdots}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{2b^2B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{g(bf-ag)^2} - \frac{\left(A+\cdots\right.}{2\cdots}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{2b^2B\log(a+bx)\left(A\cdots\right.}{g(bf-\cdots}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \frac{2b^2B\log(a+bx)\left(A\cdots\right.}{g(bf-\cdots}$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{2b^2B^2\log^2(a+bx)}{g(bf-ag)^2} - \frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \cdots$$

$$= \frac{4bB^2(bc-ad)\log(a+bx)}{(bf-ag)^2(df-cg)} - \frac{2b^2B^2\log^2(a+bx)}{g(bf-ag)^2} - \frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bf-ag)(df-cg)(f+gx)} + \cdots$$

Mathematica [A] time = 1.9621, size = 603, normalized size = 1.58

$$-\frac{4B(f+gx)\left(b^2B(f+gx)(df-cg)^2\left(\log(a+bx)\left(\log(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\right)-2\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right)\right)-Bd^2(f+gx)(bf-ag)^2\left(2\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)+\log(c+dx)\left(2\log\left(\frac{d(\ldots}{a\ldots}\right.\right.\right.\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^3,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (4*B*(f + g*x)*((b*c - a*d)*
g*(b*f - a*g)*(d*f - c*g)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - b^2*(d
*f - c*g)^2*(f + g*x)*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])
 + d^2*(b*f - a*g)^2*(f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log
[c + d*x] + (b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*(A + B*Log[(
e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x] - 2*B*(b*c - a*d)*g*(f + g*x)*(b*
(d*f - c*g)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*
Log[f + g*x]) + b^2*B*(d*f - c*g)^2*(f + g*x)*(Log[a + b*x]*(Log[a + b*x] -
 2*Log[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a
*d)]) - B*d^2*(b*f - a*g)^2*(f + g*x)*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
 - Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) -
2*B*(b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*((Log[(g*(a + b*x))/
(-(b*f) + a*g)] - Log[(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog
[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/(
(b*f - a*g)^2*(d*f - c*g)^2))/(2*g*(f + g*x)^2)
```

Maple [F] time = 2.223, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\left(\frac{2\,b^2\log\left(bx+a\right)}{b^2f^2g-2\,abfg^2+a^2g^3}-\frac{2\,d^2\log\left(dx+c\right)}{d^2f^2g-2\,cdfg^2+c^2g^3}+\frac{2\left(2\left(b^2cd-abd^2\right)f-\left(b^2c^2-a^2d^2\right)g\right)\log\left(gx\right.}{b^2d^2f^4+a^2c^2g^4-2\left(b^2cd+abd^2\right)f^3g+\left(b^2c^2+4\,abcd+a^2d^2\right)f^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x, algorithm="maxima
")
```

```
[Out] (2*b^2*log(b*x + a)/(b^2*f^2*g - 2*a*b*f*g^2 + a^2*g^3) - 2*d^2*log(d*x + c
)/(d^2*f^2*g - 2*c*d*f*g^2 + c^2*g^3) + 2*(2*(b^2*c*d - a*b*d^2)*f - (b^2*c
^2 - a^2*d^2)*g)*log(g*x + f)/(b^2*d^2*f^4 + a^2*c^2*g^4 - 2*(b^2*c*d + a*b
*d^2)*f^3*g + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^2*g^2 - 2*(a*b*c^2 + a^2*c*
d)*f*g^3) - 2*(b*c - a*d)/(b*d*f^3 + a*c*f*g^2 - (b*c + a*d)*f^2*g + (b*d*f
^2*g + a*c*g^3 - (b*c + a*d)*f*g^2)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*x +
 c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x + c^
2))/(g^3*x^2 + 2*f*g^2*x + f^2*g))*A*B - B^2*(2*log(d*x + c)^2/(g^3*x^2 + 2
*f*g^2*x + f^2*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + 4*(d*g*x +
c*g)*log(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 4*((g*lo
g(e) - g)*d*x + c*g*log(e) - d*f + 2*(d*g*x + c*g)*log(b*x + a))*log(d*x +
c))/(d*g^4*x^4 + c*f^3*g + (3*d*f*g^3 + c*g^4)*x^3 + 3*(d*f^2*g^2 + c*f*g^3
)*x^2 + (d*f^3*g + 3*c*f^2*g^2)*x), x)) - 1/2*A^2/(g^3*x^2 + 2*f*g^2*x + f^
2*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{g^3x^3+3\,fg^2x^2+3\,f^2gx+f^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^3*x^3 + 3*f*g^2*x^2 + 3*f^2*g*x + f^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B \log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right) + A\right)^2}{\left(gx+f\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^3, x)
```

3.279 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^4}\,dx$

Optimal. Leaf size=724

$$\frac{8B^2(bc-ad)\left(a^2d^2g^2-abdg(3df-cg)+b^2\left(c^2g^2-3cdfg+3d^2f^2\right)\right)\text{PolyLog}\left(2,\frac{(a+bx)(df-cg)}{(c+dx)(bf-ag)}\right)}{3(bf-ag)^3(df-cg)^3}+\frac{4B(bc-ad)\left(a^2d^2g^2\cdots\right.}{\cdots}$$

```
[Out] (4*B^2*(b*c - a*d)^2*g^2*(c + d*x))/(3*(b*f - a*g)^2*(d*f - c*g)^3*(f + g*x
)) - (2*B*(b*c - a*d)*g^2*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2]))/(3*(b*f - a*g)*(d*f - c*g)^3*(f + g*x)^2) + (4*B*(b*c - a*d)*g*(3*b*d*
f - b*c*g - 2*a*d*g)*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3
*(b*f - a*g)^3*(d*f - c*g)^2*(f + g*x)) + (b^3*(A + B*Log[(e*(a + b*x)^2)/(
c + d*x)^2])^2)/(3*g*(b*f - a*g)^3) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^
2])^2/(3*g*(f + g*x)^3) + (4*B^2*(b*c - a*d)^3*g^2*Log[(a + b*x)/(c + d*x)]
)/(3*(b*f - a*g)^3*(d*f - c*g)^3) - (4*B^2*(b*c - a*d)^3*g^2*Log[(f + g*x)/
(c + d*x)])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (8*B^2*(b*c - a*d)^2*g*(3*b*d
*f - b*c*g - 2*a*d*g)*Log[(f + g*x)/(c + d*x)])/(3*(b*f - a*g)^3*(d*f - c*g
)^3) + (4*B*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f
^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[1 -
 ((d*f - c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/(3*(b*f - a*g)^3*(d*f -
c*g)^3) + (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*
d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyLog[2, ((d*f - c*g)*(a + b*x))/((b*f -
a*g)*(c + d*x))])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rubi [A] time = 2.53975, antiderivative size = 1369, normalized size of antiderivative = 1.89, number of steps used = 40, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

$$-\frac{4B^2\log^2(a+bx)b^3}{3g(bf-ag)^3}+\frac{4B\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)b^3}{3g(bf-ag)^3}+\frac{8B^2\log(a+bx)\log\left(\frac{b(c+dx)}{bc-ad}\right)b^3}{3g(bf-ag)^3}+\frac{8B^2\text{PolyLog}\left(2,-\cdots\right.}{3g(bf-ag\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^4,x]
```

```
[Out] (-4*B^2*(b*c - a*d)^2*g)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (4*b^2
*B^2*(b*c - a*d)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*g)) + (8*b*B^2*(b*
c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/(3*(b*f - a*g)^3*(d*f - c*
```

```
g)^2) - (4*b^3*B^2*Log[a + b*x]^2)/(3*g*(b*f - a*g)^3) - (2*B*(b*c - a*d)*(
A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*f - a*g)*(d*f - c*g)*(f + g*
x)^2) - (4*B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^
2)/(c + d*x)^2]))/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)) + (4*b^3*B*Log[
a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*g*(b*f - a*g)^3) - (A
 + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(3*g*(f + g*x)^3) - (4*B^2*d^2*(b*
c - a*d)*Log[c + d*x])/(3*(b*f - a*g)*(d*f - c*g)^3) - (8*B^2*d*(b*c - a*d)
*(2*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/(3*(b*f - a*g)^2*(d*f - c*g)^3) +
(8*B^2*d^3*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c + d*x])/(3*g*(d*f - c*g)
^3) - (4*B*d^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/(3*g*
(d*f - c*g)^3) - (4*B^2*d^3*Log[c + d*x]^2)/(3*g*(d*f - c*g)^3) + (8*b^3*B^
2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(3*g*(b*f - a*g)^3) + (4*B^2
*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^3*(d*
f - c*g)^3) - (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2
*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f
 + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (4*B*(b*c - a*d)*(a^2*d^2*g^2 -
a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Log[(
e*(a + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
+ (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2
- 3*c*d*f*g + c^2*g^2))*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/(3*
(b*f - a*g)^3*(d*f - c*g)^3) + (8*b^3*B^2*PolyLog[2, -((d*(a + b*x))/(b*c -
 a*d))])/(3*g*(b*f - a*g)^3) + (8*B^2*d^3*PolyLog[2, (b*(c + d*x))/(b*c - a
*d)])/(3*g*(d*f - c*g)^3) - (8*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*
f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyLog[2, (b*(f + g*x))/
(b*f - a*g)])/(3*(b*f - a*g)^3*(d*f - c*g)^3) + (8*B^2*(b*c - a*d)*(a^2*d^2
*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*PolyL
og[2, (d*(f + g*x))/(d*f - c*g)])/(3*(b*f - a*g)^3*(d*f - c*g)^3)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
```

```
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^4}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{(2B)\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{(4B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)^3}\,dx}{3g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{(4B(bc-ad))\int \left(\frac{b^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)^3(a+bx)} + \frac{d^4\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(-df+cg)^3(c+dx)} + \right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{3g(f+gx)^3} + \frac{\left(4b^4B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{3g(bf-ag)^3} - \frac{\left(4Bd^4\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{c+dx}\,dx}{3g(df-cg)^3} +$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{4B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{4B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{2B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^2} - \frac{4B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{3(bf-ag)^2(df-cg)^2(f+gx)}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-ad)(2bdf-}{3(bf-ag)}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-ad)(2bdf-}{3(bf-ag)}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-ad)(2bdf-}{3(bf-ag)}$$

$$= -\frac{4B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)} + \frac{4b^2B^2(bc-ad)\log(a+bx)}{3(bf-ag)^3(df-cg)} + \frac{8bB^2(bc-ad)(2bdf-}{3(bf-ag)}$$

Mathematica [A] time = 4.11075, size = 909, normalized size = 1.26

$$-\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2+\frac{2B(f+gx)\left(2d^3(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)\log(c+dx)(bf-ag)^3-2Bd^3(f+gx)^2\left(\left(2\log\left(\frac{d(a+bx)}{ad-bc}\right)-\log(c+dx)\right)\log(c+dx)+2\mathrm{Poly}\cdots\right.\right.}{\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^4,x]
```

```
[Out] -((A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2 + (2*B*(f + g*x)*((b*c - a*d)*
g*(b*f - a*g)^2*(d*f - c*g)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*
(b*c - a*d)*g*(b*f - a*g)*(-(d*f) + c*g)*(-2*b*d*f + b*c*g + a*d*g)*(f + g*
x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) - 2*b^3*(d*f - c*g)^3*(f + g*x)
^2*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]) + 2*d^3*(b*f - a*g
)^3*(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x] - 2*(
b*c - a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3*c*d
*f*g + c^2*g^2))*(f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f
 + g*x] - 4*B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*d*g)*(f + g*x)^2*(b*(d*f -
 c*g)*Log[a + b*x] + (-(b*d*f) + a*d*g)*Log[c + d*x] + (b*c - a*d)*g*Log[f
+ g*x]) + 2*B*(b*c - a*d)*g*(f + g*x)*((b*c - a*d)*g*(b*f - a*g)*(d*f - c*g
) - b^2*(d*f - c*g)^2*(f + g*x)*Log[a + b*x] + d^2*(b*f - a*g)^2*(f + g*x)*
Log[c + d*x] + (b*c - a*d)*g*(-2*b*d*f + b*c*g + a*d*g)*(f + g*x)*Log[f + g
*x]) + 2*b^3*B*(d*f - c*g)^3*(f + g*x)^2*(Log[a + b*x]*(Log[a + b*x] - 2*Lo
g[(b*(c + d*x))/(b*c - a*d)]) - 2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d)])
 - 2*B*d^3*(b*f - a*g)^3*(f + g*x)^2*((2*Log[(d*(a + b*x))/(-(b*c) + a*d)]
- Log[c + d*x])*Log[c + d*x] + 2*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 4
*B*(b*c - a*d)*g*(a^2*d^2*g^2 + a*b*d*g*(-3*d*f + c*g) + b^2*(3*d^2*f^2 - 3
*c*d*f*g + c^2*g^2))*(f + g*x)^2*((Log[(g*(a + b*x))/(-(b*f) + a*g)] - Log[
(g*(c + d*x))/(-(d*f) + c*g)])*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f
 - a*g)] - PolyLog[2, (d*(f + g*x))/(d*f - c*g)])))/((b*f - a*g)^3*(d*f - c
*g)^3))/(3*g*(f + g*x)^3)
```

Maple [F] time = 2.948, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{4}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x, algorithm="maxima
")
```

```
[Out] 2/3*(2*b^3*log(b*x + a)/(b^3*f^3*g - 3*a*b^2*f^2*g^2 + 3*a^2*b*f*g^3 - a^3*
g^4) - 2*d^3*log(d*x + c)/(d^3*f^3*g - 3*c*d^2*f^2*g^2 + 3*c^2*d*f*g^3 - c^
3*g^4) + 2*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2 - 3*(b^3*c^2*d - a^2*b*d^3)*f*g +
 (b^3*c^3 - a^3*d^3)*g^2)*log(g*x + f)/(b^3*d^3*f^6 + a^3*c^3*g^6 - 3*(b^3*
c*d^2 + a*b^2*d^3)*f^5*g + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^4*g^
2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^3 + 3*(a*b^2*
c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f*g^5)
 - (5*(b^2*c*d - a*b*d^2)*f^2 - 3*(b^2*c^2 - a^2*d^2)*f*g + (a*b*c^2 - a^2*
c*d)*g^2 + 2*(2*(b^2*c*d - a*b*d^2)*f*g - (b^2*c^2 - a^2*d^2)*g^2)*x)/(b^2*
d^2*f^6 + a^2*c^2*f^2*g^4 - 2*(b^2*c*d + a*b*d^2)*f^5*g + (b^2*c^2 + 4*a*b*
c*d + a^2*d^2)*f^4*g^2 - 2*(a*b*c^2 + a^2*c*d)*f^3*g^3 + (b^2*d^2*f^4*g^2 +
 a^2*c^2*g^6 - 2*(b^2*c*d + a*b*d^2)*f^3*g^3 + (b^2*c^2 + 4*a*b*c*d + a^2*d
^2)*f^2*g^4 - 2*(a*b*c^2 + a^2*c*d)*f*g^5)*x^2 + 2*(b^2*d^2*f^5*g + a^2*c^2
*f*g^5 - 2*(b^2*c*d + a*b*d^2)*f^4*g^2 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*f^
3*g^3 - 2*(a*b*c^2 + a^2*c*d)*f^2*g^4)*x) - log(b^2*e*x^2/(d^2*x^2 + 2*c*d*
x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c*d*x +
 c^2))/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g))*A*B - 1/3*B^2*(4*log(
d*x + c)^2/(g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g) + 3*integrate(-1/3
*(3*d*g*x*log(e)^2 + 3*c*g*log(e)^2 + 12*(d*g*x + c*g)*log(b*x + a)^2 + 12*
(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 4*((3*g*log(e) - 2*g)*d*x + 3*c*
g*log(e) - 2*d*f + 6*(d*g*x + c*g)*log(b*x + a))*log(d*x + c))/(d*g^5*x^5 +
 c*f^4*g + (4*d*f*g^4 + c*g^5)*x^4 + 2*(3*d*f^2*g^3 + 2*c*f*g^4)*x^3 + 2*(2
*d*f^3*g^2 + 3*c*f^2*g^3)*x^2 + (d*f^4*g + 4*c*f^3*g^2)*x), x)) - 1/3*A^2/(
g^4*x^3 + 3*f*g^3*x^2 + 3*f^2*g^2*x + f^3*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^{2}\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\,AB\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+A^{2}}{g^{4}x^{4}+4\,fg^{3}x^{3}+6\,f^{2}g^{2}x^{2}+4\,f^{3}gx+f^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^4*x^4 + 4*f*g^3*x^3 + 6*f^2*g^2*x^2 + 4*f^3*g*x + f^4), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A\right)^2}{(gx+f)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^4,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^4, x)
```

3.280 $\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^5}\,dx$

Optimal. Leaf size=1154

result too large to display

```
[Out] -(B^2*(b*c - a*d)^2*g^3*(c + d*x)^2)/(3*(b*f - a*g)^2*(d*f - c*g)^4*(f + g*
x)^2) - (2*B^2*(b*c - a*d)^3*g^3*(c + d*x))/(3*(b*f - a*g)^3*(d*f - c*g)^4*
(f + g*x)) + (B^2*(b*c - a*d)^2*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*(c + d*x))/
((b*f - a*g)^3*(d*f - c*g)^4*(f + g*x)) + (B*(b*c - a*d)*g^3*(c + d*x)^3*(A
 + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*f - a*g)*(d*f - c*g)^4*(f + g
*x)^3) - (B*(b*c - a*d)*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*(c + d*x)^2*(A + B*
Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(2*(b*f - a*g)^2*(d*f - c*g)^4*(f + g*x)
^2) + (B*(b*c - a*d)*g*(3*a^2*d^2*g^2 - 2*a*b*d*g*(4*d*f - c*g) + b^2*(6*d^
2*f^2 - 4*c*d*f*g + c^2*g^2))*(a + b*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2]))/((b*f - a*g)^4*(d*f - c*g)^3*(f + g*x)) + (b^4*(A + B*Log[(e*(a + b*
x)^2)/(c + d*x)^2])^2)/(4*g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x)^2)/(c
+ d*x)^2])^2/(4*g*(f + g*x)^4) - (2*B^2*(b*c - a*d)^4*g^3*Log[(a + b*x)/(c
+ d*x)])/(3*(b*f - a*g)^4*(d*f - c*g)^4) + (B^2*(b*c - a*d)^3*g^2*(4*b*d*f
- b*c*g - 3*a*d*g)*Log[(a + b*x)/(c + d*x)])/((b*f - a*g)^4*(d*f - c*g)^4)
+ (2*B^2*(b*c - a*d)^4*g^3*Log[(f + g*x)/(c + d*x)])/(3*(b*f - a*g)^4*(d*f
- c*g)^4) - (B^2*(b*c - a*d)^3*g^2*(4*b*d*f - b*c*g - 3*a*d*g)*Log[(f + g*x
)/(c + d*x)])/((b*f - a*g)^4*(d*f - c*g)^4) + (2*B^2*(b*c - a*d)^2*g*(3*a^2
*d^2*g^2 - 2*a*b*d*g*(4*d*f - c*g) + b^2*(6*d^2*f^2 - 4*c*d*f*g + c^2*g^2))
*Log[(f + g*x)/(c + d*x)])/((b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c - a*d)*(
2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*
c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[1 - ((d*f
- c*g)*(a + b*x))/((b*f - a*g)*(c + d*x))])/((b*f - a*g)^4*(d*f - c*g)^4) -
 (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2
- b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, ((d*f - c*g)*(a + b*x))
/((b*f - a*g)*(c + d*x))])/((b*f - a*g)^4*(d*f - c*g)^4)
```

Rubi [A] time = 3.54306, antiderivative size = 1854, normalized size of antiderivative = 1.61, number of steps used = 44, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {2525, 12, 2528, 2524, 2418, 2390, 2301, 2394, 2393, 2391, 72}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^5,x]
```

```
[Out] -(B^2*(b*c - a*d)^2*g)/(3*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (5*B^2
*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g))/(3*(b*f - a*g)^3*(d*f - c*g)^3*
(f + g*x)) + (2*b^3*B^2*(b*c - a*d)*Log[a + b*x])/(3*(b*f - a*g)^4*(d*f - c
*g)) + (b^2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[a + b*x])/((b*f -
 a*g)^4*(d*f - c*g)^2) + (2*b*B^2*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f
 - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[a + b*x])/((b*f - a*g)
^4*(d*f - c*g)^3) - (b^4*B^2*Log[a + b*x]^2)/(g*(b*f - a*g)^4) - (B*(b*c -
a*d)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*f - a*g)*(d*f - c*g)*(
f + g*x)^3) - (B*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b
*x)^2)/(c + d*x)^2]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (B*(b*c
 - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g +
 c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*f - a*g)^3*(d*f -
c*g)^3*(f + g*x)) + (b^4*B*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x
)^2]))/(g*(b*f - a*g)^4) - (A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(4*g*
(f + g*x)^4) - (2*B^2*d^3*(b*c - a*d)*Log[c + d*x])/(3*(b*f - a*g)*(d*f - c
*g)^4) - (B^2*d^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*Log[c + d*x])/((b*f
 - a*g)^2*(d*f - c*g)^4) - (2*B^2*d*(b*c - a*d)*(a^2*d^2*g^2 - a*b*d*g*(3*d
*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[c + d*x])/((b*f - a*
g)^3*(d*f - c*g)^4) + (2*B^2*d^4*Log[-((d*(a + b*x))/(b*c - a*d))]*Log[c +
d*x])/(g*(d*f - c*g)^4) - (B*d^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*L
og[c + d*x])/(g*(d*f - c*g)^4) - (B^2*d^4*Log[c + d*x]^2)/(g*(d*f - c*g)^4)
 + (2*b^4*B^2*Log[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)])/(g*(b*f - a*g)^4
) + (B^2*(b*c - a*d)^2*g*(2*b*d*f - b*c*g - a*d*g)^2*Log[f + g*x])/((b*f -
a*g)^4*(d*f - c*g)^4) + (8*B^2*(b*c - a*d)^2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*
f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/(3*(b*f - a
*g)^4*(d*f - c*g)^4) + (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*
d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*Log[-((g*(a
+ b*x))/(b*f - a*g))]*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) - (B*(b*c
 - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2
*f^2 - 2*c*d*f*g + c^2*g^2))*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[f
 + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) - (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*
g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*
g^2))*Log[-((g*(c + d*x))/(d*f - c*g))]*Log[f + g*x])/((b*f - a*g)^4*(d*f -
 c*g)^4) + (2*b^4*B^2*PolyLog[2, -((d*(a + b*x))/(b*c - a*d))])/(g*(b*f - a
*g)^4) + (2*B^2*d^4*PolyLog[2, (b*(c + d*x))/(b*c - a*d)])/(g*(d*f - c*g)^4
) + (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g
^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g^2))*PolyLog[2, (b*(f + g*x))/(b*f -
 a*g)])/((b*f - a*g)^4*(d*f - c*g)^4) - (2*B^2*(b*c - a*d)*(2*b*d*f - b*c*g
 - a*d*g)*(2*a*b*d^2*f*g - a^2*d^2*g^2 - b^2*(2*d^2*f^2 - 2*c*d*f*g + c^2*g
^2))*PolyLog[2, (d*(f + g*x))/(d*f - c*g)])/((b*f - a*g)^4*(d*f - c*g)^4)
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{(f+gx)^5}\,dx = -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{B\int \frac{2(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{2g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{(a+bx)(c+dx)(f+gx)^4}\,dx}{g}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{(B(bc-ad))\int \left(\frac{b^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(bf-ag)^4(a+bx)} - \frac{d^5\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{(bc-ad)(-df+cg)^4(c+dx)} + \cdots\right.}{}$$

$$= -\frac{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}{4g(f+gx)^4} + \frac{\left(b^5B\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{a+bx}\,dx}{g(bf-ag)^4} - \frac{\left(Bd^5\right)\int \frac{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}{c+dx}\,dx}{g(df-cg)^4} + \cdots$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{2(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{2(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B(bc-ad)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}{3(bf-ag)(df-cg)(f+gx)^3} - \frac{B(bc-ad)(2bdf-bcg-adg)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right.\right.}{2(bf-ag)^2(df-cg)^2(f+gx)^2}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3B^2(bc-ad}{3(bf-ag)}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3B^2(bc-ad}{3(bf-ag)}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3B^2(bc-ad}{3(bf-ag)}$$

$$= -\frac{B^2(bc-ad)^2g}{3(bf-ag)^2(df-cg)^2(f+gx)^2} - \frac{5B^2(bc-ad)^2g(2bdf-bcg-adg)}{3(bf-ag)^3(df-cg)^3(f+gx)} + \frac{2b^3B^2(bc-ad}{3(bf-ag)}$$

Mathematica [A] time = 7.2527, size = 1453, normalized size = 1.26

$$B(bc-ad)\left(\frac{\log(a+bx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)b^4}{(bc-ad)(bf-ag)^4}-\frac{B\left(\log^2(a+bx)-2\log\left(\frac{b(c+dx)}{bc-ad}\right)\log(a+bx)-2\text{PolyLog}\left(2,-\frac{d(a+bx)}{bc-ad}\right)\right)b^4}{(bc-ad)(bf-ag)^4}-\frac{g\left(\left(3d^2f^2-3cdgf+c^2g^2\right)b^2-adg(3df\right.}{(bf-ag)^3(d}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(f + g*x)^5,x]
```

```
[Out] -(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2/(4*g*(f + g*x)^4) + (B*(b*c - a
*d)*(-(g*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/(3*(b*f - a*g)*(d*f - c*
g)*(f + g*x)^3) - (g*(2*b*d*f - b*c*g - a*d*g)*(A + B*Log[(e*(a + b*x)^2)/(
c + d*x)^2]))/(2*(b*f - a*g)^2*(d*f - c*g)^2*(f + g*x)^2) - (g*(a^2*d^2*g^2
 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*(A + B*Lo
g[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*f - a*g)^3*(d*f - c*g)^3*(f + g*x)) +
(b^4*Log[a + b*x]*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]))/((b*c - a*d)*(b
*f - a*g)^4) - (d^4*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])*Log[c + d*x])/
((b*c - a*d)*(d*f - c*g)^4) + (g*(2*b*d*f - b*c*g - a*d*g)*(2*b^2*d^2*f^2 -
 2*b^2*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)*(A + B*Log[(e*(
a + b*x)^2)/(c + d*x)^2])*Log[f + g*x])/((b*f - a*g)^4*(d*f - c*g)^4) + (2*
B*(b*c - a*d)*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c*g) + b^2*(3*d^2*f^2 - 3*c
*d*f*g + c^2*g^2))*((b*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)) - (d*Log[c +
 d*x])/((b*c - a*d)*(d*f - c*g)) + (g*Log[f + g*x])/((b*f - a*g)*(d*f - c*g
))))/((b*f - a*g)^3*(d*f - c*g)^3) - (B*(b*c - a*d)*g*(2*b*d*f - b*c*g - a*
d*g)*(g/((b*f - a*g)*(d*f - c*g)*(f + g*x)) - (b^2*Log[a + b*x])/((b*c - a*
d)*(b*f - a*g)^2) + (d^2*Log[c + d*x])/((b*c - a*d)*(d*f - c*g)^2) - (g*(2*
b*d*f - b*c*g - a*d*g)*Log[f + g*x])/((b*f - a*g)^2*(d*f - c*g)^2)))/((b*f
- a*g)^2*(d*f - c*g)^2) - (B*(b*c - a*d)*g*(g/((b*f - a*g)*(d*f - c*g)*(f +
 g*x)^2) + (2*g*(2*b*d*f - b*c*g - a*d*g))/((b*f - a*g)^2*(d*f - c*g)^2*(f
+ g*x)) - (2*b^3*Log[a + b*x])/((b*c - a*d)*(b*f - a*g)^3) + (2*d^3*Log[c +
 d*x])/((b*c - a*d)*(d*f - c*g)^3) - (2*g*(a^2*d^2*g^2 - a*b*d*g*(3*d*f - c
*g) + b^2*(3*d^2*f^2 - 3*c*d*f*g + c^2*g^2))*Log[f + g*x])/((b*f - a*g)^3*(
d*f - c*g)^3)))/(3*(b*f - a*g)*(d*f - c*g)) - (b^4*B*(Log[a + b*x]^2 - 2*Lo
g[a + b*x]*Log[(b*(c + d*x))/(b*c - a*d)] - 2*PolyLog[2, -((d*(a + b*x))/(b
*c - a*d))]))/((b*c - a*d)*(b*f - a*g)^4) + (B*d^4*(2*Log[-((d*(a + b*x))/(
b*c - a*d))]*Log[c + d*x] - Log[c + d*x]^2 + 2*PolyLog[2, (b*(c + d*x))/(b*
c - a*d)]))/((b*c - a*d)*(d*f - c*g)^4) - (2*B*g*(2*b*d*f - b*c*g - a*d*g)*
(2*b^2*d^2*f^2 - 2*b^2*c*d*f*g - 2*a*b*d^2*f*g + b^2*c^2*g^2 + a^2*d^2*g^2)
*(Log[-((g*(a + b*x))/(b*f - a*g))]*Log[f + g*x] - Log[-((g*(c + d*x))/(d*f
 - c*g))]*Log[f + g*x] + PolyLog[2, (b*(f + g*x))/(b*f - a*g)] - PolyLog[2,
 (d*(f + g*x))/(d*f - c*g)]))/((b*f - a*g)^4*(d*f - c*g)^4)))/g
```

Maple [F] time = 4.122, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{5}} \left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x, algorithm="maxima
")
```

```
[Out] 1/6*(6*b^4*log(b*x + a)/(b^4*f^4*g - 4*a*b^3*f^3*g^2 + 6*a^2*b^2*f^2*g^3 -
4*a^3*b*f*g^4 + a^4*g^5) - 6*d^4*log(d*x + c)/(d^4*f^4*g - 4*c*d^3*f^3*g^2
+ 6*c^2*d^2*f^2*g^3 - 4*c^3*d*f*g^4 + c^4*g^5) + 6*(4*(b^4*c*d^3 - a*b^3*d^
4)*f^3 - 6*(b^4*c^2*d^2 - a^2*b^2*d^4)*f^2*g + 4*(b^4*c^3*d - a^3*b*d^4)*f*
g^2 - (b^4*c^4 - a^4*d^4)*g^3)*log(g*x + f)/(b^4*d^4*f^8 + a^4*c^4*g^8 - 4*
(b^4*c*d^3 + a*b^3*d^4)*f^7*g + 2*(3*b^4*c^2*d^2 + 8*a*b^3*c*d^3 + 3*a^2*b^
2*d^4)*f^6*g^2 - 4*(b^4*c^3*d + 6*a*b^3*c^2*d^2 + 6*a^2*b^2*c*d^3 + a^3*b*d
^4)*f^5*g^3 + (b^4*c^4 + 16*a*b^3*c^3*d + 36*a^2*b^2*c^2*d^2 + 16*a^3*b*c*d
^3 + a^4*d^4)*f^4*g^4 - 4*(a*b^3*c^4 + 6*a^2*b^2*c^3*d + 6*a^3*b*c^2*d^2 +
a^4*c*d^3)*f^3*g^5 + 2*(3*a^2*b^2*c^4 + 8*a^3*b*c^3*d + 3*a^4*c^2*d^2)*f^2*
g^6 - 4*(a^3*b*c^4 + a^4*c^3*d)*f*g^7) - (26*(b^3*c*d^2 - a*b^2*d^3)*f^4 -
31*(b^3*c^2*d - a^2*b*d^3)*f^3*g + (11*b^3*c^3 + 15*a*b^2*c^2*d - 15*a^2*b*
c*d^2 - 11*a^3*d^3)*f^2*g^2 - 7*(a*b^2*c^3 - a^3*c*d^2)*f*g^3 + 2*(a^2*b*c^
3 - a^3*c^2*d)*g^4 + 6*(3*(b^3*c*d^2 - a*b^2*d^3)*f^2*g^2 - 3*(b^3*c^2*d -
a^2*b*d^3)*f*g^3 + (b^3*c^3 - a^3*d^3)*g^4)*x^2 + 3*(14*(b^3*c*d^2 - a*b^2*
d^3)*f^3*g - 15*(b^3*c^2*d - a^2*b*d^3)*f^2*g^2 + (5*b^3*c^3 + 3*a*b^2*c^2*
d - 3*a^2*b*c*d^2 - 5*a^3*d^3)*f*g^3 - (a*b^2*c^3 - a^3*c*d^2)*g^4)*x)/(b^3
*d^3*f^9 + a^3*c^3*f^3*g^6 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^8*g + 3*(b^3*c^2*d
 + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^7*g^2 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*
```

```
c*d^2 + a^3*d^3)*f^6*g^3 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^5*g^
4 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^4*g^5 + (b^3*d^3*f^6*g^3 + a^3*c^3*g^9 - 3*
(b^3*c*d^2 + a*b^2*d^3)*f^5*g^4 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)
*f^4*g^5 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^3*g^6 + 3*
(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^2*g^7 - 3*(a^2*b*c^3 + a^3*c^2*d)
*f*g^8)*x^3 + 3*(b^3*d^3*f^7*g^2 + a^3*c^3*f*g^8 - 3*(b^3*c*d^2 + a*b^2*d^3
)*f^6*g^3 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^5*g^4 - (b^3*c^3 +
9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*f^4*g^5 + 3*(a*b^2*c^3 + 3*a^2*b*c
^2*d + a^3*c*d^2)*f^3*g^6 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^2*g^7)*x^2 + 3*(b^3
*d^3*f^8*g + a^3*c^3*f^2*g^7 - 3*(b^3*c*d^2 + a*b^2*d^3)*f^7*g^2 + 3*(b^3*c
^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*f^6*g^3 - (b^3*c^3 + 9*a*b^2*c^2*d + 9*a^
2*b*c*d^2 + a^3*d^3)*f^5*g^4 + 3*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*f^
4*g^5 - 3*(a^2*b*c^3 + a^3*c^2*d)*f^3*g^6)*x) - 3*log(b^2*e*x^2/(d^2*x^2 +
2*c*d*x + c^2) + 2*a*b*e*x/(d^2*x^2 + 2*c*d*x + c^2) + a^2*e/(d^2*x^2 + 2*c
*d*x + c^2))/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g^2*x + f^4*g))
*A*B - B^2*(log(d*x + c)^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*g^3*x^2 + 4*f^3*g
^2*x + f^4*g) + integrate(-(d*g*x*log(e)^2 + c*g*log(e)^2 + 4*(d*g*x + c*g)
*log(b*x + a)^2 + 4*(d*g*x*log(e) + c*g*log(e))*log(b*x + a) - 2*((2*g*log(
e) - g)*d*x + 2*c*g*log(e) - d*f + 4*(d*g*x + c*g)*log(b*x + a))*log(d*x +
c))/(d*g^6*x^6 + c*f^5*g + (5*d*f*g^5 + c*g^6)*x^5 + 5*(2*d*f^2*g^4 + c*f*g
^5)*x^4 + 10*(d*f^3*g^3 + c*f^2*g^4)*x^3 + 5*(d*f^4*g^2 + 2*c*f^3*g^3)*x^2
+ (d*f^5*g + 5*c*f^4*g^2)*x), x)) - 1/4*A^2/(g^5*x^4 + 4*f*g^4*x^3 + 6*f^2*
g^3*x^2 + 4*f^3*g^2*x + f^4*g)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2}{g^5x^5+5\,fg^4x^4+10\,f^2g^3x^3+10\,f^3g^2x^2+5\,f^4gx+f^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
)^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
+ A^2)/(g^5*x^5 + 5*f*g^4*x^4 + 10*f^2*g^3*x^3 + 10*f^3*g^2*x^2 + 5*f^4*g*x
 + f^5), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2/(g*x+f)**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}{(gx+f)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2/(g*x+f)^5,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2/(g*x + f)^5, x)
```

3.281 $\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{(f+gx)^2}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi [A] time = 0.174391, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + 2*f*g*De
fer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x] + g^2*Defer[Int][x^
2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{f^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{2fgx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{g^2x^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\
&= f^2\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+(2fg)\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+g^2\int \frac{x^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}
\end{aligned}$$

Mathematica [A] time = 0.176417, size = 0, normalized size = 0.

$$\int \frac{(f+gx)^2}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Maple [A] time = 1.148, size = 0, normalized size = 0.

$$\int \left(gx+f\right)^2\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int((g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(gx+f\right)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{g^2x^2 + 2\,fgx + f^2}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(
d^2*x^2 + 2*c*d*x + c^2)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(gx + f)^2}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

3.282 $\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{f+gx}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi [A] time = 0.0918307, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x] + g*Defer[In
t][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx &= \int \left(\frac{f}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}+\frac{gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\right)dx\\ &= f\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx+g\int \frac{x}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx\end{aligned}$$

Mathematica [A] time = 0.126028, size = 0, normalized size = 0.

$$\int \frac{f+gx}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]),x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2]), x]
```

Maple [A] time = 0.936, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int((g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{gx+f}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*
x + c^2)) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{gx+f}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

3.283 $\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{1}{B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A},x\right)$$

```
[Out] Unintegrable[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x]
```

Rubi [A] time = 0.0141488, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1),x]

[Out] Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x]
```

Rubi steps

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx=\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Mathematica [A] time = 0.0354575, size = 0, normalized size = 0.

$$\int \frac{1}{A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-1), x]
```

Maple [A] time = 0.885, size = 0, normalized size = 0.

$$\int \left(A + B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right) + A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate(1/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{B\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right) + A}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral(1/(B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
) + A), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/(B*log((b*x + a)^2*e/(d*x + c)^2) + A), x)
```

3.284 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi [A] time = 0.0643133, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.0823876, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Maple [A] time = 1.248, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Agx+Af+\left(Bgx+Bf\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas")
```

```
[Out] integral(1/(A*g*x + A*f + (B*g*x + B*f)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)
/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

3.285 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi [A] time = 0.0678718, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]

[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.0852005, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Maple [A] time = 1.284, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}} \left(A+B\ln\left(\frac{e\,(bx+a)^{2}}{(dx+c)^{2}}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{2}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{Ag^{2}x^{2}+2\,Afgx+Af^{2}+\left(Bg^{2}x^{2}+2\,Bfgx+Bf^{2}\right)\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^2*x^2 + 2*A*f*g*x + A*f^2 + (B*g^2*x^2 + 2*B*f*g*x + B*f^2)
*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

3.286 $\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^3\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi [A] time = 0.0615744, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx=\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Mathematica [A] time = 0.0891913, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^3\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])), x]
```

Maple [A] time = 1.363, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

```
[Out] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}\left(B\log\left(\frac{(bx+a)^{2}e}{(dx+c)^{2}}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="maxima
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{Ag^{3}x^{3}+3\,Afg^{2}x^{2}+3\,Af^{2}gx+Af^{3}+\left(Bg^{3}x^{3}+3\,Bfg^{2}x^{2}+3\,Bf^{2}gx+Bf^{3}\right)\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="fricas
")
```

```
[Out] integral(1/(A*g^3*x^3 + 3*A*f*g^2*x^2 + 3*A*f^2*g*x + A*f^3 + (B*g^3*x^3 +
3*B*f*g^2*x^2 + 3*B*f^2*g*x + B*f^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d
^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^3\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2)),x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)), x)
```

3.287 $\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{(f+gx)^2}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi [A] time = 0.191497, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] f^2*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + 2*f*g*De
fer[Int][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x] + g^2*Defer[Int][
x^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx = \int \left(\frac{f^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{2fgx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{g^2x^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)dx$$

$$= f^2\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+(2fg)\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+g^2\int \frac{}{\left(A+B\log\right.}$$

Mathematica [A] time = 0.694762, size = 0, normalized size = 0.

$$\int \frac{(f+gx)^2}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(f + g*x)^2/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Maple [A] time = 1.006, size = 0, normalized size = 0.

$$\int (gx+f)^2\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdg^2x^4+acf^2+\left(adg^2+\left(2\,dfg+cg^2\right)b\right)x^3+\left(\left(2\,dfg+cg^2\right)a+\left(df^2+2\,cfg\right)b\right)x^2+\left(bcf^2+\left(df^2+2\,cfg\right)a\right)x}{2\left(2\,(bc-ad)B^2\log\left(bx+a\right)-2\,(bc-ad)B^2\log\left(dx+c\right)+(bc-ad)AB+(bc\log\left(e\right)-ad\log\left(e\right))B^2\right)}+\int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] -1/2*(b*d*g^2*x^4 + a*c*f^2 + (a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^3 + ((2*d*f
*g + c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x^2 + (b*c*f^2 + (d*f^2 + 2*c*f*g)*a)*
x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c
- a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(4*b*d*g^2*x^3
+ b*c*f^2 + 3*(a*d*g^2 + (2*d*f*g + c*g^2)*b)*x^2 + (d*f^2 + 2*c*f*g)*a + 2
```

```
*((2*d*f*g + c*g^2)*a + (d*f^2 + 2*c*f*g)*b)*x)/(2*(b*c - a*d)*B^2*log(b*x
+ a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d
*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{g^2x^2+2\,fgx+f^2}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral((g^2*x^2 + 2*f*g*x + f^2)/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)
/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(
d^2*x^2 + 2*c*d*x + c^2)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(gx+f)^2}{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)^2/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.288 $\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{f+gx}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi [A] time = 0.102734, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] f*Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x] + g*Defer[In
t][x/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx &= \int \left(\frac{f}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}+\frac{gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\right)dx\\ &= f\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx+g\int \frac{x}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 0.410425, size = 0, normalized size = 0.

$$\int \frac{f+gx}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2,x]
```

```
[Out] Integrate[(f + g*x)/(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2, x]
```

Maple [A] time = 1.032, size = 0, normalized size = 0.

$$\int (gx+f)\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int((g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdgx^3+acf+\left(adg+\left(df+cg\right)b\right)x^2+\left(bcf+\left(df+cg\right)a\right)x}{2\left(2\,(bc-ad)B^2\log(bx+a)-2\,(bc-ad)B^2\log(dx+c)+(bc-ad)AB+(bc\log(e)-ad\log(e))B^2\right)}+\int\frac{}{2\left(2\,(bc-ac\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] -1/2*(b*d*g*x^3 + a*c*f + (a*d*g + (d*f + c*g)*b)*x^2 + (b*c*f + (d*f + c*g
)*a)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) +
(b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^2) + integrate(1/2*(3*b*d*g*x
^2 + b*c*f + (d*f + c*g)*a + 2*(a*d*g + (d*f + c*g)*b)*x)/(2*(b*c - a*d)*B^
2*log(b*x + a) - 2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*lo
g(e) - a*d*log(e))*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{gx+f}{B^2\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\,AB\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)+A^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral((g*x + f)/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*
d*x + c^2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*
x + c^2)) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int\frac{gx+f}{\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)/(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2, x)
```

3.289 $\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{1}{\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x]
```

Rubi [A] time = 0.0139057, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2),x]

[Out] Defer[Int][(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x]
```

Rubi steps

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.213572, size = 0, normalized size = 0.

$$\int \frac{1}{\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^(-2), x]
```

Maple [A] time = 1.013, size = 0, normalized size = 0.

$$\int \left(A+B\ln\left(\frac{e\,(bx+a)^{2}}{(dx+c)^{2}}\right)\right)^{-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int(1/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdx^{2}+ac+(bc+ad)x}{2\left(2\,(bc-ad)B^{2}\log\left(bx+a\right)-2\,(bc-ad)B^{2}\log\left(dx+c\right)+(bc-ad)AB+(bc\log\left(e\right)-ad\log\left(e\right))B^{2}\right)}+\int\frac{}{2\left(2\,(bc-ad)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/(2*(b*c - a*d)*B^2*log(b*x + a) - 2*(b
*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e))*B^
2) + integrate(1/2*(2*b*d*x + b*c + a*d)/(2*(b*c - a*d)*B^2*log(b*x + a) -
2*(b*c - a*d)*B^2*log(d*x + c) + (b*c - a*d)*A*B + (b*c*log(e) - a*d*log(e)
)*B^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{B^{2}\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)^{2}+2\,AB\log\left(\frac{b^{2}ex^{2}+2\,abex+a^{2}e}{d^{2}x^{2}+2\,cdx+c^{2}}\right)+A^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(B^2*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^
2))^2 + 2*A*B*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2)
) + A^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(B\log\left(\frac{(bx+a)^2 e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^2*e/(d*x + c)^2) + A)^(-2), x)
```

3.290 $\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{1}{(f+gx)\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi [A] time = 0.071707, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.485656, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((f + g*x)*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Maple [A] time = 1.44, size = 0, normalized size = 0.

$$\int \frac{1}{gx+f}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int(1/(g*x+f)/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{bdx^2+ac+(bc+ad)x}{2\left(\left(bcf-adf\right)AB+\left(bcf\log\left(e\right)-adf\log\left(e\right)\right)B^2+\left(\left(bcg-adg\right)AB+\left(bcg\log\left(e\right)-adg\log\left(e\right)\right)B^2\right)x+2\left(\left(bcg-adg\right)\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxima
")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f - a*d*f)*A*B + (b*c*f*log(e) -
 a*d*f*log(e))*B^2 + ((b*c*g - a*d*g)*A*B + (b*c*g*log(e) - a*d*g*log(e))*B
^2)*x + 2*((b*c*g - a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(b*x + a) - 2*((
b*c*g - a*d*g)*B^2*x + (b*c*f - a*d*f)*B^2)*log(d*x + c)) + integrate(1/2*(
b*d*g*x^2 + 2*b*d*f*x + b*c*f + (d*f - c*g)*a)/((b*c*f^2 - a*d*f^2)*A*B + (
b*c*f^2*log(e) - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*
log(e) - a*d*g^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*l
og(e) - a*d*f*g*log(e))*B^2)*x + 2*((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*
g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - 2*((b*c*g^2 -
a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*l
og(d*x + c)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2gx+A^2f+\left(B^2gx+B^2f\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2+2\left(ABgx+ABf\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fricas
")
```

```
[Out] integral(1/(A^2*g*x + A^2*f + (B^2*g*x + B^2*f)*log((b^2*e*x^2 + 2*a*b*e*x
+ a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g*x + A*B*f)*log((b^2*e*x^2
+ 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((g*x + f)*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

3.291 $\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^2\left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi [A] time = 0.0757691, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Defer[Int][1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx=\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.607418, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^2\left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]

[Out] Integrate[1/((f + g*x)^2*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Maple [A] time = 1.641, size = 0, normalized size = 0.

$$\int \frac{1}{(gx+f)^2}\left(A+B\ln\left(\frac{e\,(bx+a)^2}{(dx+c)^2}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)

[Out] int(1/(g*x+f)^2/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")

[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/((b*c*f^2 - a*d*f^2)*A*B + (b*c*f^2*lo
g(e) - a*d*f^2*log(e))*B^2 + ((b*c*g^2 - a*d*g^2)*A*B + (b*c*g^2*log(e) - a
*d*g^2*log(e))*B^2)*x^2 + 2*((b*c*f*g - a*d*f*g)*A*B + (b*c*f*g*log(e) - a*
d*f*g*log(e))*B^2)*x + 2*((b*c*g^2 - a*d*g^2)*B^2*x^2 + 2*(b*c*f*g - a*d*f*
g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(b*x + a) - 2*((b*c*g^2 - a*d*g^2)*B
^2*x^2 + 2*(b*c*f*g - a*d*f*g)*B^2*x + (b*c*f^2 - a*d*f^2)*B^2)*log(d*x + c
)) - integrate(-1/2*(b*c*f + (d*f - 2*c*g)*a - (a*d*g - (2*d*f - c*g)*b)*x)
/(((b*c*g^3 - a*d*g^3)*A*B + (b*c*g^3*log(e) - a*d*g^3*log(e))*B^2)*x^3 + (
b*c*f^3 - a*d*f^3)*A*B + (b*c*f^3*log(e) - a*d*f^3*log(e))*B^2 + 3*((b*c*f*
g^2 - a*d*f*g^2)*A*B + (b*c*f*g^2*log(e) - a*d*f*g^2*log(e))*B^2)*x^2 + 3*(
(b*c*f^2*g - a*d*f^2*g)*A*B + (b*c*f^2*g*log(e) - a*d*f^2*g*log(e))*B^2)*x
+ 2*((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b
*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(b*x + a) - 2*((b
*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*
```

```
g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f^3)*B^2)*log(d*x + c)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2g^2x^2 + 2\,A^2fgx + A^2f^2 + \left(B^2g^2x^2 + 2\,B^2fgx + B^2f^2\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2 + 2\left(ABg^2x^2 + 2\,ABfgx + A\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^2*x^2 + 2*A^2*f*g*x + A^2*f^2 + (B^2*g^2*x^2 + 2*B^2*f*g*
x + B^2*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))
^2 + 2*(A*B*g^2*x^2 + 2*A*B*f*g*x + A*B*f^2)*log((b^2*e*x^2 + 2*a*b*e*x + a
^2*e)/(d^2*x^2 + 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**2/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^2\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^2/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^2*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

3.292 $\int \frac{1}{(f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2} \, dx$

Optimal. Leaf size=33

$$\text{Unintegrable}\left(\frac{1}{(f+gx)^3 \left(B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)+A\right)^2},x\right)$$

```
[Out] Unintegrable[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi [A] time = 0.0713971, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]

[Out] Defer[Int][1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Rubi steps

$$\int \frac{1}{(f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2} \, dx = \int \frac{1}{(f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2} \, dx$$

Mathematica [A] time = 0.627948, size = 0, normalized size = 0.

$$\int \frac{1}{(f+gx)^3 \left(A+B\log\left(\frac{e(a+bx)^2}{(c+dx)^2}\right)\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2),x]
```

```
[Out] Integrate[1/((f + g*x)^3*(A + B*Log[(e*(a + b*x)^2)/(c + d*x)^2])^2), x]
```

Maple [A] time = 2.162, size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{2}}{\left(dx+c\right)^{2}}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

```
[Out] int(1/(g*x+f)^3/(A+B*ln(e*(b*x+a)^2/(d*x+c)^2))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="maxi
ma")
```

```
[Out] -1/2*(b*d*x^2 + a*c + (b*c + a*d)*x)/(((b*c*g^3 - a*d*g^3)*A*B + (b*c*g^3*l
og(e) - a*d*g^3*log(e))*B^2)*x^3 + (b*c*f^3 - a*d*f^3)*A*B + (b*c*f^3*log(e
) - a*d*f^3*log(e))*B^2 + 3*((b*c*f*g^2 - a*d*f*g^2)*A*B + (b*c*f*g^2*log(e
) - a*d*f*g^2*log(e))*B^2)*x^2 + 3*((b*c*f^2*g - a*d*f^2*g)*A*B + (b*c*f^2*
g*log(e) - a*d*f^2*g*log(e))*B^2)*x + 2*((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b
*c*f*g^2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3
- a*d*f^3)*B^2)*log(b*x + a) - 2*((b*c*g^3 - a*d*g^3)*B^2*x^3 + 3*(b*c*f*g^
2 - a*d*f*g^2)*B^2*x^2 + 3*(b*c*f^2*g - a*d*f^2*g)*B^2*x + (b*c*f^3 - a*d*f
^3)*B^2)*log(d*x + c)) - integrate(1/2*(b*d*g*x^2 - b*c*f - (d*f - 3*c*g)*a
 + 2*(a*d*g - (d*f - c*g)*b)*x)/(((b*c*g^4 - a*d*g^4)*A*B + (b*c*g^4*log(e)
 - a*d*g^4*log(e))*B^2)*x^4 + 4*((b*c*f*g^3 - a*d*f*g^3)*A*B + (b*c*f*g^3*l
og(e) - a*d*f*g^3*log(e))*B^2)*x^3 + (b*c*f^4 - a*d*f^4)*A*B + (b*c*f^4*log
(e) - a*d*f^4*log(e))*B^2 + 6*((b*c*f^2*g^2 - a*d*f^2*g^2)*A*B + (b*c*f^2*g
^2*log(e) - a*d*f^2*g^2*log(e))*B^2)*x^2 + 4*((b*c*f^3*g - a*d*f^3*g)*A*B +
```

```
(b*c*f^3*g*log(e) - a*d*f^3*g*log(e))*B^2)*x + 2*((b*c*g^4 - a*d*g^4)*B^2*
x^4 + 4*(b*c*f*g^3 - a*d*f*g^3)*B^2*x^3 + 6*(b*c*f^2*g^2 - a*d*f^2*g^2)*B^2
*x^2 + 4*(b*c*f^3*g - a*d*f^3*g)*B^2*x + (b*c*f^4 - a*d*f^4)*B^2)*log(b*x +
 a) - 2*((b*c*g^4 - a*d*g^4)*B^2*x^4 + 4*(b*c*f*g^3 - a*d*f*g^3)*B^2*x^3 +
6*(b*c*f^2*g^2 - a*d*f^2*g^2)*B^2*x^2 + 4*(b*c*f^3*g - a*d*f^3*g)*B^2*x + (
b*c*f^4 - a*d*f^4)*B^2)*log(d*x + c)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{A^2g^3x^3 + 3\,A^2fg^2x^2 + 3\,A^2f^2gx + A^2f^3 + \left(B^2g^3x^3 + 3\,B^2fg^2x^2 + 3\,B^2f^2gx + B^2f^3\right)\log\left(\frac{b^2ex^2+2\,abex+a^2e}{d^2x^2+2\,cdx+c^2}\right)^2 + \cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="fric
as")
```

```
[Out] integral(1/(A^2*g^3*x^3 + 3*A^2*f*g^2*x^2 + 3*A^2*f^2*g*x + A^2*f^3 + (B^2*
g^3*x^3 + 3*B^2*f*g^2*x^2 + 3*B^2*f^2*g*x + B^2*f^3)*log((b^2*e*x^2 + 2*a*b
*e*x + a^2*e)/(d^2*x^2 + 2*c*d*x + c^2))^2 + 2*(A*B*g^3*x^3 + 3*A*B*f*g^2*x
^2 + 3*A*B*f^2*g*x + A*B*f^3)*log((b^2*e*x^2 + 2*a*b*e*x + a^2*e)/(d^2*x^2
+ 2*c*d*x + c^2))), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)**3/(A+B*ln(e*(b*x+a)**2/(d*x+c)**2))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(gx+f\right)^3\left(B\log\left(\frac{(bx+a)^2e}{(dx+c)^2}\right)+A\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(g*x+f)^3/(A+B*log(e*(b*x+a)^2/(d*x+c)^2))^2,x, algorithm="giac
")
```

```
[Out] integrate(1/((g*x + f)^3*(B*log((b*x + a)^2*e/(d*x + c)^2) + A)^2), x)
```

3.293 $\int (g+hx)^4 (A+B\log(e(a+bx)^n(c+dx)^{-n}))\,dx$

Optimal. Leaf size=365

$$-\frac{Bh^2nx^2(bc-ad)\left(a^2d^2h^2-abdh(5dg-ch)+b^2\left(c^2h^2-5cdgh+10d^2g^2\right)\right)}{10b^3d^3}+\frac{Bhnx(bc-ad)\left(-a^2bd^2h^2(5dg-ch)+a^3d\right.}{}$$

```
[Out] (B*(b*c - a*d)*h*(a^3*d^3*h^3 - a^2*b*d^2*h^2*(5*d*g - c*h) + a*b^2*d*h*(10
*d^2*g^2 - 5*c*d*g*h + c^2*h^2) - b^3*(10*d^3*g^3 - 10*c*d^2*g^2*h + 5*c^2*
d*g*h^2 - c^3*h^3))*n*x)/(5*b^4*d^4) - (B*(b*c - a*d)*h^2*(a^2*d^2*h^2 - a*
b*d*h*(5*d*g - c*h) + b^2*(10*d^2*g^2 - 5*c*d*g*h + c^2*h^2))*n*x^2)/(10*b^
3*d^3) - (B*(b*c - a*d)*h^3*(5*b*d*g - b*c*h - a*d*h)*n*x^3)/(15*b^2*d^2) -
 (B*(b*c - a*d)*h^4*n*x^4)/(20*b*d) - (B*(b*g - a*h)^5*n*Log[a + b*x])/(5*b
^5*h) + (B*(d*g - c*h)^5*n*Log[c + d*x])/(5*d^5*h) + ((g + h*x)^5*(A + B*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]))/(5*h)
```

Rubi [A] time = 0.712262, antiderivative size = 377, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$-\frac{Bh^2nx^2(bc-ad)\left(a^2d^2h^2-abdh(5dg-ch)+b^2\left(c^2h^2-5cdgh+10d^2g^2\right)\right)}{10b^3d^3}+\frac{Bhnx(bc-ad)\left(-a^2bd^2h^2(5dg-ch)+a^3d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (B*(b*c - a*d)*h*(a^3*d^3*h^3 - a^2*b*d^2*h^2*(5*d*g - c*h) + a*b^2*d*h*(10
*d^2*g^2 - 5*c*d*g*h + c^2*h^2) - b^3*(10*d^3*g^3 - 10*c*d^2*g^2*h + 5*c^2*
d*g*h^2 - c^3*h^3))*n*x)/(5*b^4*d^4) - (B*(b*c - a*d)*h^2*(a^2*d^2*h^2 - a*
b*d*h*(5*d*g - c*h) + b^2*(10*d^2*g^2 - 5*c*d*g*h + c^2*h^2))*n*x^2)/(10*b^
3*d^3) - (B*(b*c - a*d)*h^3*(5*b*d*g - b*c*h - a*d*h)*n*x^3)/(15*b^2*d^2) -
 (B*(b*c - a*d)*h^4*n*x^4)/(20*b*d) + (A*(g + h*x)^5)/(5*h) - (B*(b*g - a*h
)^5*n*Log[a + b*x])/(5*b^5*h) + (B*(d*g - c*h)^5*n*Log[c + d*x])/(5*d^5*h)
 + (B*(g + h*x)^5*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(5*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (g+hx)^4 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx = \int \left(A(g+hx)^4+B(g+hx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$$

$$= \frac{A(g+hx)^5}{5h}+B\int (g+hx)^4\log\left(e(a+bx)^n(c+dx)^{-n}\right) dx$$

$$= \frac{A(g+hx)^5}{5h}+\frac{B(g+hx)^5\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{5h}-\frac{(B(bc-ad)n)}{5$$

$$= \frac{A(g+hx)^5}{5h}+\frac{B(g+hx)^5\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{5h}-\frac{(B(bc-ad)n)}{}$$

$$= \frac{B(bc-ad)h\left(a^3d^3h^3-a^2bd^2h^2(5dg-ch)+ab^2dh\left(10d^2g^2-5cdgh+\right.\right.}{5b^4d^4}$$

Mathematica [A] time = 0.952097, size = 463, normalized size = 1.27

$$\frac{bdx\left(Bhn(bc-ad)\left(-6a^2bd^2h^2(-2ch+10dg+dhx)+12a^3d^3h^3+2ab^2dh\left(6c^2h^2-3cdh(10g+hx)+d^2\left(60g^2+15ghx+\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(12*A*b^4*d^4*(5*g^4 + 10*g^3*h*x + 10*g^2*h^2*x^2 + 5*g*h^3*x^3 + h
^4*x^4) + B*(b*c - a*d)*h*n*(12*a^3*d^3*h^3 - 6*a^2*b*d^2*h^2*(10*d*g - 2*c
```

```
*h + d*h*x) + 2*a*b^2*d*h*(6*c^2*h^2 - 3*c*d*h*(10*g + h*x) + d^2*(60*g^2 +
 15*g*h*x + 2*h^2*x^2)) - b^3*(-12*c^3*h^3 + 6*c^2*d*h^2*(10*g + h*x) - 2*c
*d^2*h*(60*g^2 + 15*g*h*x + 2*h^2*x^2) + d^3*(120*g^3 + 60*g^2*h*x + 20*g*h
^2*x^2 + 3*h^3*x^3)))) + 12*a^2*B*d^5*h*(-10*b^3*g^3 + 10*a*b^2*g^2*h - 5*a
^2*b*g*h^2 + a^3*h^3)*n*Log[a + b*x] - 12*b^4*B*(-5*a*d^5*g^4 + b*c*(5*d^4*
g^4 - 10*c*d^3*g^3*h + 10*c^2*d^2*g^2*h^2 - 5*c^3*d*g*h^3 + c^4*h^4))*n*Log
[c + d*x] + 12*b^4*B*d^5*(5*a*g^4 + b*x*(5*g^4 + 10*g^3*h*x + 10*g^2*h^2*x^
2 + 5*g*h^3*x^3 + h^4*x^4))*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(60*b^5*d^5)
```

Maple [C] time = 0.689, size = 2576, normalized size = 7.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^4*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] B*g^4*x*ln((b*x+a)^n)+B*ln(e)*g^4*x+1/5*h^4*B*ln(e)*x^5+1/5*h^4*B*x^5*ln((b
*x+a)^n)-1/5*(h*x+g)^5*B/h*ln((d*x+c)^n)+2*h*B*ln(e)*g^3*x^2+2*h^2*B*g^2*x^
3*ln((b*x+a)^n)+2*h*B*g^3*x^2*ln((b*x+a)^n)+1/5/h*B*ln(d*x+c)*g^5*n+h^3*B*g
*x^4*ln((b*x+a)^n)+h^3*B*ln(e)*g*x^4+2*h^2*B*ln(e)*g^2*x^3+1/5*h^4*A*x^5+2*
h^2/b^3*B*ln(-b*x-a)*a^3*g^2*n-2*h/b^2*B*ln(-b*x-a)*a^2*g^3*n-I*h*B*Pi*g^3*
x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n)*cs
gn(I*(b*x+a)^n/((d*x+c)^n))^2-1/2*I*h^3*B*Pi*g*x^4*csgn(I*(b*x+a)^n/((d*x+c
)^n))^3+1/10*I*h^4*B*Pi*x^5*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))
^2-1/2*I*h^3*B*Pi*g*x^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-I*h*B*Pi*g^3*x^2*
csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n/((d*x+c)^
n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/10*I*h^4*B*Pi*x^5*csgn(I*e)*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^2+1/10*I*h^4*B*Pi*x^5*csgn(I/((d*x+c)^n))*csgn(I*(
b*x+a)^n/((d*x+c)^n))^2+1/10*I*h^4*B*Pi*x^5*csgn(I*(b*x+a)^n/((d*x+c)^n))*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*h^2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n/((d*x+
c)^n))^3-I*h^2*B*Pi*g^2*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2*I*B*Pi*g^
4*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^4*x*csgn(I/((d
*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/d^4*h^3*B*ln(d*x+c)*c^4*g*n-2/d
^3*h^2*B*ln(d*x+c)*c^3*g^2*n+2/d^2*h*B*ln(d*x+c)*c^2*g^3*n-h^3/b^4*B*ln(-b*
x-a)*a^4*g*n+1/15/d^2*h^4*B*c^2*n*x^3+1/10*h^4/b^3*B*a^3*n*x^2-1/10/d^3*h^4
*B*c^3*n*x^2-1/5*h^4/b^4*B*a^4*n*x+1/5/d^4*h^4*B*c^4*n*x+I*h*B*Pi*g^3*x^2*c
sgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*h*B*Pi*g^3*x^2*csgn(I*(b*x+a)^
n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*h^2*B*Pi*g^2*x^3*csgn(I/((d*x+c)^n))*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*h^2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*h^2*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n)
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*h*B*Pi*g^3*x^2*csgn(I*(b*x+a)^n/((d*x+c)
```

```
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*B*Pi*g^4*x*csgn(I*(b*x+a)^n)*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*B*Pi*g^4*x*csgn(I*e)
*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/10*I*h^4*B
*Pi*x^5*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
-1/10*I*h^4*B*Pi*x^5*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)+1/2*I*h^3*B*Pi*g*x^4*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+
a)^n)^2+1/2*I*h^3*B*Pi*g*x^4*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^
n))^2+1/2*I*h^3*B*Pi*g*x^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+1/2*I*h^3*B*Pi*g*x^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2+h^3*A*g*x^4+2*h^2*A*g^2*x^3+2*h*A*g^3*x^2+A*g^4*x-1/d*B*ln(d*x+
c)*c*g^4*n+1/b*B*ln(-b*x-a)*a*g^4*n-1/5/d^5*h^4*B*ln(d*x+c)*c^5*n+1/5*h^4/b
^5*B*ln(-b*x-a)*a^5*n-1/10*I*h^4*B*Pi*x^5*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1
/10*I*h^4*B*Pi*x^5*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*g^4*x*csgn(
I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*g^4*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
^3+2*h/b*B*a*g^3*n*x-1/d^3*h^3*B*c^3*g*n*x+2/d^2*h^2*B*c^2*g^2*n*x-2/d*h*B*
c*g^3*n*x+1/3*h^3/b*B*a*g*n*x^3-1/3/d*h^3*B*c*g*n*x^3-1/2*h^3/b^2*B*a^2*g*n
*x^2+h^2/b*B*a*g^2*n*x^2+1/2/d^2*h^3*B*c^2*g*n*x^2-1/d*h^2*B*c*g^2*n*x^2+h^
3/b^3*B*a^3*g*n*x-2*h^2/b^2*B*a^2*g^2*n*x+I*h^2*B*Pi*g^2*x^3*csgn(I*e)*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*h*B*Pi*g^3*x^2*csgn(I/((d*x+c)^n))*csgn(I*(
b*x+a)^n/((d*x+c)^n))^2+1/20*h^4/b*B*a*n*x^4-1/20/d*h^4*B*c*n*x^4-1/15*h^4/
b^2*B*a^2*n*x^3-1/2*I*h^3*B*Pi*g*x^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))-I*h*B*Pi*g^3*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*h*B*Pi*g^3*x^2*csgn(I*(b*x+a)
^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-I*h^2*B*Pi*g^2*x^3*cs
gn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*h^2
*B*Pi*g^2*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+
c)^n))-1/2*I*h^3*B*Pi*g*x^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)
```

Maxima [A] time = 1.40192, size = 906, normalized size = 2.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/5*B*h^4*x^5*log((b*x + a)^n*e/(d*x + c)^n) + 1/5*A*h^4*x^5 + B*g*h^3*x^4*
log((b*x + a)^n*e/(d*x + c)^n) + A*g*h^3*x^4 + 2*B*g^2*h^2*x^3*log((b*x + a
)^n*e/(d*x + c)^n) + 2*A*g^2*h^2*x^3 + 2*B*g^3*h*x^2*log((b*x + a)^n*e/(d*x
 + c)^n) + 2*A*g^3*h*x^2 + B*g^4*x*log((b*x + a)^n*e/(d*x + c)^n) + A*g^4*x
```

```
 + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*g^4/e - 2*(a^2*e*n*log(b
*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*B*g^3
*h/e + (2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d
*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*B*g^2
*h^2/e - 1/6*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d*x + c)/d^4 + (2*
(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a^2*b*d^3*e*n)*x^2
 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*g*h^3/e + 1/60*(12*a^5*e*n
*log(b*x + a)/b^5 - 12*c^5*e*n*log(d*x + c)/d^5 - (3*(b^4*c*d^3*e*n - a*b^3
*d^4*e*n)*x^4 - 4*(b^4*c^2*d^2*e*n - a^2*b^2*d^4*e*n)*x^3 + 6*(b^4*c^3*d*e*
n - a^3*b*d^4*e*n)*x^2 - 12*(b^4*c^4*e*n - a^4*d^4*e*n)*x)/(b^4*d^4))*B*h^4
/e
```

Fricas [B] time = 1.1267, size = 1623, normalized size = 4.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/60*(12*A*b^5*d^5*h^4*x^5 + 3*(20*A*b^5*d^5*g*h^3 - (B*b^5*c*d^4 - B*a*b^4
*d^5)*h^4*n)*x^4 + 4*(30*A*b^5*d^5*g^2*h^2 - (5*(B*b^5*c*d^4 - B*a*b^4*d^5)
*g*h^3 - (B*b^5*c^2*d^3 - B*a^2*b^3*d^5)*h^4)*n)*x^3 + 6*(20*A*b^5*d^5*g^3*
h - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*g^2*h^2 - 5*(B*b^5*c^2*d^3 - B*a^2*b^3*
d^5)*g*h^3 + (B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*h^4)*n)*x^2 + 12*(5*A*b^5*d^5*
g^4 - (10*(B*b^5*c*d^4 - B*a*b^4*d^5)*g^3*h - 10*(B*b^5*c^2*d^3 - B*a^2*b^3
*d^5)*g^2*h^2 + 5*(B*b^5*c^3*d^2 - B*a^3*b^2*d^5)*g*h^3 - (B*b^5*c^4*d - B*
a^4*b*d^5)*h^4)*n)*x + 12*(B*b^5*d^5*h^4*n*x^5 + 5*B*b^5*d^5*g*h^3*n*x^4 +
10*B*b^5*d^5*g^2*h^2*n*x^3 + 10*B*b^5*d^5*g^3*h*n*x^2 + 5*B*b^5*d^5*g^4*n*x
 + (5*B*a*b^4*d^5*g^4 - 10*B*a^2*b^3*d^5*g^3*h + 10*B*a^3*b^2*d^5*g^2*h^2 -
 5*B*a^4*b*d^5*g*h^3 + B*a^5*d^5*h^4)*n)*log(b*x + a) - 12*(B*b^5*d^5*h^4*n
*x^5 + 5*B*b^5*d^5*g*h^3*n*x^4 + 10*B*b^5*d^5*g^2*h^2*n*x^3 + 10*B*b^5*d^5*
g^3*h*n*x^2 + 5*B*b^5*d^5*g^4*n*x + (5*B*b^5*c*d^4*g^4 - 10*B*b^5*c^2*d^3*g
^3*h + 10*B*b^5*c^3*d^2*g^2*h^2 - 5*B*b^5*c^4*d*g*h^3 + B*b^5*c^5*h^4)*n)*l
og(d*x + c) + 12*(B*b^5*d^5*h^4*x^5 + 5*B*b^5*d^5*g*h^3*x^4 + 10*B*b^5*d^5*
g^2*h^2*x^3 + 10*B*b^5*d^5*g^3*h*x^2 + 5*B*b^5*d^5*g^4*x)*log(e))/(b^5*d^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**4*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^4*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] Timed out
```

3.294 $\int (g+hx)^3 (A+B\log(e(a+bx)^n(c+dx)^{-n}))\,dx$

Optimal. Leaf size=236

$$-\frac{Bhnx(bc-ad)\left(a^2d^2h^2-abdh(4dg-ch)+b^2\left(c^2h^2-4cdgh+6d^2g^2\right)\right)}{4b^3d^3}+\frac{(g+hx)^4\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{4h}$$

```
[Out] -(B*(b*c - a*d)*h*(a^2*d^2*h^2 - a*b*d*h*(4*d*g - c*h) + b^2*(6*d^2*g^2 - 4
*c*d*g*h + c^2*h^2))*n*x)/(4*b^3*d^3) - (B*(b*c - a*d)*h^2*(4*b*d*g - b*c*h
 - a*d*h)*n*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*h^3*n*x^3)/(12*b*d) - (B*(b*g
 - a*h)^4*n*Log[a + b*x])/(4*b^4*h) + (B*(d*g - c*h)^4*n*Log[c + d*x])/(4*d
^4*h) + ((g + h*x)^4*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(4*h)
```

Rubi [A] time = 0.455644, antiderivative size = 248, normalized size of antiderivative = 1.05, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$-\frac{Bhnx(bc-ad)\left(a^2d^2h^2-abdh(4dg-ch)+b^2\left(c^2h^2-4cdgh+6d^2g^2\right)\right)}{4b^3d^3}-\frac{Bh^2nx^2(bc-ad)(-adh-bch+4bdg)}{8b^2d^2}-\frac{Bn(b$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*h*(a^2*d^2*h^2 - a*b*d*h*(4*d*g - c*h) + b^2*(6*d^2*g^2 - 4
*c*d*g*h + c^2*h^2))*n*x)/(4*b^3*d^3) - (B*(b*c - a*d)*h^2*(4*b*d*g - b*c*h
 - a*d*h)*n*x^2)/(8*b^2*d^2) - (B*(b*c - a*d)*h^3*n*x^3)/(12*b*d) + (A*(g +
 h*x)^4)/(4*h) - (B*(b*g - a*h)^4*n*Log[a + b*x])/(4*b^4*h) + (B*(d*g - c*h
)^4*n*Log[c + d*x])/(4*d^4*h) + (B*(g + h*x)^4*Log[(e*(a + b*x)^n)/(c + d*x
)^n])/(4*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
```

```
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (g+hx)^3 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx = \int \left(A(g+hx)^3+B(g+hx)^3\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$$

$$= \frac{A(g+hx)^4}{4h} + B\int (g+hx)^3 \log \left(e(a+bx)^n(c+dx)^{-n}\right) dx$$

$$= \frac{A(g+hx)^4}{4h} + \frac{B(g+hx)^4 \log \left(e(a+bx)^n(c+dx)^{-n}\right)}{4h} - \frac{(B(bc-ad)n)}{}$$

$$= \frac{A(g+hx)^4}{4h} + \frac{B(g+hx)^4 \log \left(e(a+bx)^n(c+dx)^{-n}\right)}{4h} - \frac{(B(bc-ad)n)}{}$$

$$= -\frac{B(bc-ad)h\left(a^2d^2h^2-abdh(4dg-ch)+b^2\left(6d^2g^2-4cdgh+c^2h^2\right)\right.}{4b^3d^3}$$

Mathematica [A] time = 0.566985, size = 314, normalized size = 1.33

$$\frac{bdx\left(6Ab^3d^3\left(6g^2hx+4g^3+4gh^2x^2+h^3x^3\right)-Bhn(bc-ad)\left(6a^2d^2h^2-3abdh(-2ch+8dg+dhx)+b^2\left(6c^2h^2-3cdh(8g\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (b*d*x*(6*A*b^3*d^3*(4*g^3 + 6*g^2*h*x + 4*g*h^2*x^2 + h^3*x^3) - B*(b*c -
a*d)*h*n*(6*a^2*d^2*h^2 - 3*a*b*d*h*(8*d*g - 2*c*h + d*h*x) + b^2*(6*c^2*h^
2 - 3*c*d*h*(8*g + h*x) + 2*d^2*(18*g^2 + 6*g*h*x + h^2*x^2)))) - 6*a^2*B*d
^4*h*(6*b^2*g^2 - 4*a*b*g*h + a^2*h^2)*n*Log[a + b*x] + 6*b^3*B*(4*a*d^4*g^
3 + b*c*(-4*d^3*g^3 + 6*c*d^2*g^2*h - 4*c^2*d*g*h^2 + c^3*h^3))*n*Log[c + d
*x] + 6*b^3*B*d^4*(4*a*g^3 + b*x*(4*g^3 + 6*g^2*h*x + 4*g*h^2*x^2 + h^3*x^3
))*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(24*b^4*d^4)
```

Maple [C] time = 0.613, size = 1967, normalized size = 8.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^3*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] B*g^3*x*ln((b*x+a)^n)+B*ln(e)*g^3*x+1/4*h^3*B*x^4*ln((b*x+a)^n)+1/4*h^3*B*l
n(e)*x^4-1/4*(h*x+g)^4*B/h*ln((d*x+c)^n)+1/4*h^3*A*x^4+3/2*h*B*ln(e)*g^2*x^
2+1/4/h*B*ln(-d*x-c)*g^4*n+h^2*B*g*x^3*ln((b*x+a)^n)+3/2*h*B*g^2*x^2*ln((b*
x+a)^n)+h^2*B*ln(e)*g*x^3+1/12*h^3/b*B*a*n*x^3-1/12/d*h^3*B*c*n*x^3-1/8*h^3
/b^2*B*a^2*n*x^2+1/8/d^2*h^3*B*c^2*n*x^2+1/4*h^3/b^3*B*a^3*n*x-1/4/d^3*h^3*
B*c^3*n*x-1/d^3*h^2*B*ln(-d*x-c)*c^3*g*n+3/2/d^2*h*B*ln(-d*x-c)*c^2*g^2*n+h
^2/b^3*B*ln(b*x+a)*a^3*g*n-3/2*h/b^2*B*ln(b*x+a)*a^2*g^2*n+1/2*I*B*Pi*g^3*x
*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi
*g^3*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/8*I*h^3*B*Pi*x^4*csgn(
I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*x+a)^
n/((d*x+c)^n))^3-1/2*I*h^2*B*Pi*g*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-3/4
*I*h*B*Pi*g^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-3/4*I*h*B*Pi*g^2*x^2*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/8*I*h^3*B*Pi*x^4*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))^2+1/8*I*h^3*B*Pi*x^4*csgn(I*(b*x+a)^n/((d*x+c)^n))*
csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^3*x*csgn(I*(b*x+a)^n)*csgn(I
*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g^3*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+
a)^n/((d*x+c)^n))^2+1/8*I*h^3*B*Pi*x^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^2-1/2*I*B*Pi*g^3*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/8*I*h^3*
B*Pi*x^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/8*I*h^3*B*Pi*x^4*csgn(I*(b*x+a
)^n/((d*x+c)^n))^3-1/2*I*B*Pi*g^3*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*h^2
/b*B*a*g*n*x^2-1/2/d*h^2*B*c*g*n*x^2-h^2/b^2*B*a^2*g*n*x+3/2*h/b*B*a*g^2*n*
x+1/d^2*h^2*B*c^2*g*n*x-3/2/d*h*B*c*g^2*n*x+1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*
x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3/4*I*h*B*Pi*g^2*x^2*
csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/8*I*h^3*B*Pi*x^4*csgn(I
*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+3/4*I*h*B*Pi*
g^2*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*I*B*Pi*g^3*x*csgn(I
*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*P
i*g^3*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
+1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2
*I*h^2*B*Pi*g*x^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+3/4*I
*h*B*Pi*g^2*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^
n)^2+1/2*I*h^2*B*Pi*g*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+3/4*I
*h*B*Pi*g^2*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-1/8*I*h
^3*B*Pi*x^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)+h^2*A*g*x^3+3/2*h*A*g^2*x^2+A*g^3*x+1/4/d^4*h^3*B*ln(-d*x-c)*c^4*n
```

```
-1/4*h^3/b^4*B*ln(b*x+a)*a^4*n-1/d*B*ln(-d*x-c)*c*g^3*n+1/b*B*ln(b*x+a)*a*g
^3*n-3/4*I*h*B*Pi*g^2*x^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/
((d*x+c)^n)*(b*x+a)^n)-1/2*I*h^2*B*Pi*g*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*x+
c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-3/4*I*h*B*Pi*g^2*x^2*csgn(I*(b*x+a)^n)
*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*h^2*B*Pi*g*x^3*csg
n(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
```

Maxima [B] time = 1.20409, size = 630, normalized size = 2.67

$$\frac{1}{4}Bh^3x^4\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+\frac{1}{4}Ah^3x^4+Bgh^2x^3\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+Agh^2x^3+\frac{3}{2}Bg^2hx^2\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+\frac{3}{2}Ag^2hx^2+Bg$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
")
```

```
[Out] 1/4*B*h^3*x^4*log((b*x + a)^n*e/(d*x + c)^n) + 1/4*A*h^3*x^4 + B*g*h^2*x^3*
log((b*x + a)^n*e/(d*x + c)^n) + A*g*h^2*x^3 + 3/2*B*g^2*h*x^2*log((b*x + a
)^n*e/(d*x + c)^n) + 3/2*A*g^2*h*x^2 + B*g^3*x*log((b*x + a)^n*e/(d*x + c)^
n) + A*g^3*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*g^3/e - 3/2*
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*g^2*h/e + 1/2*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x +
c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x
)/(b^2*d^2))*B*g*h^2/e - 1/24*(6*a^4*e*n*log(b*x + a)/b^4 - 6*c^4*e*n*log(d
*x + c)/d^4 + (2*(b^3*c*d^2*e*n - a*b^2*d^3*e*n)*x^3 - 3*(b^3*c^2*d*e*n - a
^2*b*d^3*e*n)*x^2 + 6*(b^3*c^3*e*n - a^3*d^3*e*n)*x)/(b^3*d^3))*B*h^3/e
```

Fricas [B] time = 1.10268, size = 1149, normalized size = 4.87

$$\frac{6\,Ab^4d^4h^3x^4+2\left(12\,Ab^4d^4gh^2-\left(Bb^4cd^3-Bab^3d^4\right)h^3n\right)x^3+3\left(12\,Ab^4d^4g^2h-\left(4\left(Bb^4cd^3-Bab^3d^4\right)gh^2-\left(Bb^4c^2d^2-Ba\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/24*(6*A*b^4*d^4*h^3*x^4 + 2*(12*A*b^4*d^4*g*h^2 - (B*b^4*c*d^3 - B*a*b^3*
d^4)*h^3*n)*x^3 + 3*(12*A*b^4*d^4*g^2*h - (4*(B*b^4*c*d^3 - B*a*b^3*d^4)*g*
h^2 - (B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*h^3)*n)*x^2 + 6*(4*A*b^4*d^4*g^3 - (6
*(B*b^4*c*d^3 - B*a*b^3*d^4)*g^2*h - 4*(B*b^4*c^2*d^2 - B*a^2*b^2*d^4)*g*h^
2 + (B*b^4*c^3*d - B*a^3*b*d^4)*h^3)*n)*x + 6*(B*b^4*d^4*h^3*n*x^4 + 4*B*b^
4*d^4*g*h^2*n*x^3 + 6*B*b^4*d^4*g^2*h*n*x^2 + 4*B*b^4*d^4*g^3*n*x + (4*B*a*
b^3*d^4*g^3 - 6*B*a^2*b^2*d^4*g^2*h + 4*B*a^3*b*d^4*g*h^2 - B*a^4*d^4*h^3)*
n)*log(b*x + a) - 6*(B*b^4*d^4*h^3*n*x^4 + 4*B*b^4*d^4*g*h^2*n*x^3 + 6*B*b^
4*d^4*g^2*h*n*x^2 + 4*B*b^4*d^4*g^3*n*x + (4*B*b^4*c*d^3*g^3 - 6*B*b^4*c^2*
d^2*g^2*h + 4*B*b^4*c^3*d*g*h^2 - B*b^4*c^4*h^3)*n)*log(d*x + c) + 6*(B*b^4
*d^4*h^3*x^4 + 4*B*b^4*d^4*g*h^2*x^3 + 6*B*b^4*d^4*g^2*h*x^2 + 4*B*b^4*d^4*
g^3*x)*log(e))/(b^4*d^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**3*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^3*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] Timed out
```

3.295 $\int (g+hx)^2 (A+B\log(e(a+bx)^n(c+dx)^{-n}))\,dx$

Optimal. Leaf size=158

$$\frac{(g+hx)^3 (B\log(e(a+bx)^n(c+dx)^{-n})+A)}{3h}-\frac{Bhnx(bc-ad)(-adh-bch+3bdg)}{3b^2d^2}-\frac{Bn(bg-ah)^3\log(a+bx)}{3b^3h}-\frac{Bh^2nx^2(}{6l}$$

```
[Out] -(B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*h^2*n*x^2)/(6*b*d) - (B*(b*g - a*h)^3*n*Log[a + b*x])/(3*b^3*h) + (B*(d*
g - c*h)^3*n*Log[c + d*x])/(3*d^3*h) + ((g + h*x)^3*(A + B*Log[(e*(a + b*x)
^n)/(c + d*x)^n]))/(3*h)
```

Rubi [A] time = 0.240267, antiderivative size = 170, normalized size of antiderivative = 1.08, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$-\frac{Bhnx(bc-ad)(-adh-bch+3bdg)}{3b^2d^2}-\frac{Bn(bg-ah)^3\log(a+bx)}{3b^3h}+\frac{B(g+hx)^3\log(e(a+bx)^n(c+dx)^{-n})}{3h}-\frac{Bh^2nx^2(bc-}{6bd}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(3*b^2*d^2) - (B*(b*c - a*
d)*h^2*n*x^2)/(6*b*d) + (A*(g + h*x)^3)/(3*h) - (B*(b*g - a*h)^3*n*Log[a +
b*x])/(3*b^3*h) + (B*(d*g - c*h)^3*n*Log[c + d*x])/(3*d^3*h) + (B*(g + h*x)
^3*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx = \int \left(A(g+hx)^2 + B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right) dx$$
$$= \frac{A(g+hx)^3}{3h} + B\int (g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right) dx$$
$$= \frac{A(g+hx)^3}{3h} + \frac{B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h} - \frac{(B(bc-ad)n}{}$$
$$= \frac{A(g+hx)^3}{3h} + \frac{B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h} - \frac{(B(bc-ad)n}{}$$
$$= -\frac{B(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2} - \frac{B(bc-ad)h^2nx^2}{6bd} + \frac{A(g+hx}{3h}$$

Mathematica [A] time = 0.337093, size = 204, normalized size = 1.29

$$\frac{2a^2Bd^3hn(ah-3bg)\log(a+bx) + b\left(dx\left(Bhn(bc-ad)(2adh+2bch-6bdg-bdhx) + 2Ab^2d^2\left(3g^2+3ghx+h^2x^2\right)\right) - 2\right.}{6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (2*a^2*B*d^3*h*(-3*b*g + a*h)*n*Log[a + b*x] + b*(d*x*(B*(b*c - a*d)*h*n*(-
6*b*d*g + 2*b*c*h + 2*a*d*h - b*d*h*x) + 2*A*b^2*d^2*(3*g^2 + 3*g*h*x + h^2
*x^2)) - 2*b*B*(-3*a*d^3*g^2 + b*c*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n*Log
[c + d*x] + 2*b*B*d^3*(3*a*g^2 + b*x*(3*g^2 + 3*g*h*x + h^2*x^2))*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]))/(6*b^3*d^3)
```

Maple [C] time = 0.576, size = 1389, normalized size = 8.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] B*g^2*x*ln((b*x+a)^n)-1/3*(h*x+g)^3*B/h*ln((d*x+c)^n)+1/3*h^2*B*ln(e)*x^3+1
/3*h^2*B*x^3*ln((b*x+a)^n)+B*ln(e)*g^2*x+h*B*ln(e)*g*x^2+h*B*g*x^2*ln((b*x+
a)^n)+1/3/h*B*ln(d*x+c)*g^3*n+1/3*h^2*A*x^3-1/2*I*h*B*Pi*g*x^2*csgn(I*e)*cs
gn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*h*B*Pi*g*
x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+h*A
*g*x^2+A*g^2*x+1/3*h^2/b^3*B*ln(-b*x-a)*a^3*n-1/3/d^3*h^2*B*ln(d*x+c)*c^3*n
+1/b*B*ln(-b*x-a)*a*g^2*n-1/d*B*ln(d*x+c)*c*g^2*n-1/2*I*B*Pi*g^2*x*csgn(I*e
/((d*x+c)^n)*(b*x+a)^n)^3-1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-
1/6*I*h^2*B*Pi*x^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/6*I*h^2*B*Pi*x^3*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3+1/6*h^2/b*B*a*n*x^2-1/6/d*h^2*B*c*n*x^2-1/3*h^
2/b^2*B*a^2*n*x+1/3/d^2*h^2*B*c^2*n*x-h/b^2*B*ln(-b*x-a)*a^2*g*n+1/d^2*h*B*
ln(d*x+c)*c^2*g*n-1/2*I*h*B*Pi*g*x^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*
I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*I*B*Pi*g^2*x*csgn(I*e)*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n)*c
sgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g^2*x*csgn(I/((d*x+c)^n))*csgn(I*
(b*x+a)^n/((d*x+c)^n))^2+1/6*I*h^2*B*Pi*x^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)^2+1/6*I*h^2*B*Pi*x^3*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^2+1/6*I*h^2*B*Pi*x^3*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/
((d*x+c)^n))^2+1/6*I*h^2*B*Pi*x^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*
x+c)^n))^2-1/6*I*h^2*B*Pi*x^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(
I*e/((d*x+c)^n)*(b*x+a)^n)-1/6*I*h^2*B*Pi*x^3*csgn(I*(b*x+a)^n)*csgn(I/((d*
x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+1/2*I*h*B*Pi*g*x^2*csgn(I*e)*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*h*B*Pi*g*x^2*csgn(I*(b*x+a)^n)*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*h*B*Pi*g*x^2*csgn(I/((d*x+c)^n))*csgn(I*
(b*x+a)^n/((d*x+c)^n))^2-1/2*I*B*Pi*g^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+
c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*g^2*x*csgn(I*(b*x+a)^n)*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+h/b*B*a*g*n*x-1/d*h*B*c*g*
n*x
```

Maxima [A] time = 1.19188, size = 397, normalized size = 2.51

$$\frac{1}{3}\,Bh^2x^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{3}\,Ah^2x^3+Bghx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Aghx^2+Bg^2x\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Ag^2x+\frac{\left(\frac{aen\log(bx+a)}{b}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima
```

```
")
```

```
[Out] 1/3*B*h^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A*h^2*x^3 + B*g*h*x^2*lo
g((b*x + a)^n*e/(d*x + c)^n) + A*g*h*x^2 + B*g^2*x*log((b*x + a)^n*e/(d*x +
 c)^n) + A*g^2*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d)*B*g^2/e -
(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e*n - a*d*e*n)*
x/(b*d))*B*g*h/e + 1/6*(2*a^3*e*n*log(b*x + a)/b^3 - 2*c^3*e*n*log(d*x + c)
/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^2*e*n - a^2*d^2*e*n)*x)/
(b^2*d^2))*B*h^2/e
```

Fricas [B] time = 1.08998, size = 753, normalized size = 4.77

$$\frac{2\,Ab^3d^3h^2x^3 + \left(6\,Ab^3d^3gh - \left(Bb^3cd^2 - Bab^2d^3\right)h^2n\right)x^2 + 2\left(3\,Ab^3d^3g^2 - \left(3\left(Bb^3cd^2 - Bab^2d^3\right)gh - \left(Bb^3c^2d - Ba^2bd^3\right)h \right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas
")
```

```
[Out] 1/6*(2*A*b^3*d^3*h^2*x^3 + (6*A*b^3*d^3*g*h - (B*b^3*c*d^2 - B*a*b^2*d^3)*h
^2*n)*x^2 + 2*(3*A*b^3*d^3*g^2 - (3*(B*b^3*c*d^2 - B*a*b^2*d^3)*g*h - (B*b^
3*c^2*d - B*a^2*b*d^3)*h^2)*n)*x + 2*(B*b^3*d^3*h^2*n*x^3 + 3*B*b^3*d^3*g*h
*n*x^2 + 3*B*b^3*d^3*g^2*n*x + (3*B*a*b^2*d^3*g^2 - 3*B*a^2*b*d^3*g*h + B*a
^3*d^3*h^2)*n)*log(b*x + a) - 2*(B*b^3*d^3*h^2*n*x^3 + 3*B*b^3*d^3*g*h*n*x^
2 + 3*B*b^3*d^3*g^2*n*x + (3*B*b^3*c*d^2*g^2 - 3*B*b^3*c^2*d*g*h + B*b^3*c^
3*h^2)*n)*log(d*x + c) + 2*(B*b^3*d^3*h^2*x^3 + 3*B*b^3*d^3*g*h*x^2 + 3*B*b
^3*d^3*g^2*x)*log(e))/(b^3*d^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [B] time = 77.4189, size = 402, normalized size = 2.54

$$\frac{1}{3}\left(Ah^2 + Bh^2\right)x^3 + \frac{1}{3}\left(Bh^2nx^3 + 3\,Bghnx^2 + 3\,Bg^2nx\right)\log\left(bx + a\right) - \frac{1}{3}\left(Bh^2nx^3 + 3\,Bghnx^2 + 3\,Bg^2nx\right)\log\left(dx + c\right) - \frac{(B}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/3*(A*h^2 + B*h^2)*x^3 + 1/3*(B*h^2*n*x^3 + 3*B*g*h*n*x^2 + 3*B*g^2*n*x)*l
og(b*x + a) - 1/3*(B*h^2*n*x^3 + 3*B*g*h*n*x^2 + 3*B*g^2*n*x)*log(d*x + c)
- 1/6*(B*b*c*h^2*n - B*a*d*h^2*n - 6*A*b*d*g*h - 6*B*b*d*g*h)*x^2/(b*d) + 1
/3*(3*B*a*b^2*g^2*n - 3*B*a^2*b*g*h*n + B*a^3*h^2*n)*log(b*x + a)/b^3 - 1/3
*(3*B*c*d^2*g^2*n - 3*B*c^2*d*g*h*n + B*c^3*h^2*n)*log(-d*x - c)/d^3 - 1/3*
(3*B*b^2*c*d*g*h*n - 3*B*a*b*d^2*g*h*n - B*b^2*c^2*h^2*n + B*a^2*d^2*h^2*n
- 3*A*b^2*d^2*g^2 - 3*B*b^2*d^2*g^2)*x/(b^2*d^2)
```

3.296 $\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$

Optimal. Leaf size=116

$$\frac{(g+hx)^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{2h}-\frac{Bn(bg-ah)^2\log(a+bx)}{2b^2h}-\frac{Bhnx(bc-ad)}{2bd}+\frac{Bn(dg-ch)^2\log(c+dx)}{2d^2h}$$

```
[Out] -(B*(b*c - a*d)*h*n*x)/(2*b*d) - (B*(b*g - a*h)^2*n*Log[a + b*x])/(2*b^2*h)
 + (B*(d*g - c*h)^2*n*Log[c + d*x])/(2*d^2*h) + ((g + h*x)^2*(A + B*Log[(e*
(a + b*x)^n)/(c + d*x)^n]))/(2*h)
```

Rubi [A] time = 0.148869, antiderivative size = 128, normalized size of antiderivative = 1.1, number of steps used = 5, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {6742, 2492, 72}

$$-\frac{Bn(bg-ah)^2\log(a+bx)}{2b^2h}+\frac{B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h}-\frac{Bhnx(bc-ad)}{2bd}+\frac{A(g+hx)^2}{2h}+\frac{Bn(dg-ch)^2\log(}{2d^2h}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] -(B*(b*c - a*d)*h*n*x)/(2*b*d) + (A*(g + h*x)^2)/(2*h) - (B*(b*g - a*h)^2*n
*Log[a + b*x])/(2*b^2*h) + (B*(d*g - c*h)^2*n*Log[c + d*x])/(2*d^2*h) + (B*
(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx = \int \left(A(g+hx)+B(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,dx$$
$$= \frac{A(g+hx)^2}{2h}+B\int (g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx$$
$$= \frac{A(g+hx)^2}{2h}+\frac{B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h}-\frac{(B(bc-ad)n)\int}{2}$$
$$= \frac{A(g+hx)^2}{2h}+\frac{B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h}-\frac{(B(bc-ad)n)\int}{}$$
$$= -\frac{B(bc-ad)hnx}{2bd}+\frac{A(g+hx)^2}{2h}-\frac{B(bg-ah)^2n\log(a+bx)}{2b^2h}+\frac{B(dg-}{}$$

Mathematica [A] time = 0.167751, size = 124, normalized size = 1.07

$$\frac{-a^2Bd^2hn\log(a+bx)+bd\left(x(Bhn(ad-bc)+Abd(2g+hx))+Bd(2ag+bx(2g+hx))\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)+bBn}{2b^2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]),x]
```

```
[Out] (-(a^2*B*d^2*h*n*Log[a + b*x]) + b*B*(2*a*d^2*g + b*c*(-2*d*g + c*h))*n*Log
[c + d*x] + b*d*(x*(B*(-(b*c) + a*d)*h*n + A*b*d*(2*g + h*x)) + B*d*(2*a*g
+ b*x*(2*g + h*x))*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(2*b^2*d^2)
```

Maple [C] time = 0.541, size = 839, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n))),x)
```

```
[Out] 1/2*A*h*x^2+A*g*x+1/2*B*h*x^2*ln((b*x+a)^n)-1/2*B*x*(h*x+2*g)*ln((d*x+c)^n)
+B*g*x*ln((b*x+a)^n)+1/2*B*ln(e)*h*x^2+B*ln(e)*g*x-1/2*I*B*Pi*g*x*csgn(I*(b
*x+a)^n/((d*x+c)^n))^3-1/2*I*B*Pi*g*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+1/2
*I*B*Pi*g*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*I*B*Pi*g*
x*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*I*B*P
i*g*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2/b^2*B*ln(b*x+a)*a^2*h
*n+1/b*B*ln(b*x+a)*a*g*n+1/2/d^2*B*ln(-d*x-c)*c^2*h*n-1/d*B*ln(-d*x-c)*c*g*
n-1/4*I*B*Pi*h*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/4*I*B*Pi*h*x^2*csgn(I*
e/((d*x+c)^n)*(b*x+a)^n)^3-1/4*I*B*Pi*h*x^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+
c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/4*I*B*Pi*h*x^2*csgn(I*e)*csgn(I*(b*x
+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*I*B*Pi*g*x*csgn(I*(b
*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))-1/2*I*B*Pi*g*x*c
sgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2/
b*B*a*h*n*x-1/2/d*B*c*h*n*x+1/4*I*B*Pi*h*x^2*csgn(I/((d*x+c)^n))*csgn(I*(b*
x+a)^n/((d*x+c)^n))^2+1/4*I*B*Pi*h*x^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^2+1/4*I*B*Pi*h*x^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2+1/4*I*B*Pi*h*x^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^2+1/2*I*B*Pi*g*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2
```

Maxima [A] time = 1.16413, size = 208, normalized size = 1.79

$$\frac{1}{2}\,Bhx^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+\frac{1}{2}\,Ahx^2+Bgx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+Agx+\frac{\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)Bg}{e}-\frac{\left(\frac{a^2en\log(bx+a)}{b^2}-\frac{c^2e}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="maxima")
```

```
[Out] 1/2*B*h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A*h*x^2 + B*g*x*log((b*x +
 a)^n*e/(d*x + c)^n) + A*g*x + (a*e*n*log(b*x + a)/b - c*e*n*log(d*x + c)/d
)*B*g/e - 1/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 + (b*c*e
*n - a*d*e*n)*x/(b*d))*B*h/e
```

Fricas [A] time = 1.01071, size = 413, normalized size = 3.56

$$\frac{Ab^2d^2hx^2+\left(2\,Ab^2d^2g-\left(Bb^2cd-Babd^2\right)hn\right)x+\left(Bb^2d^2hnx^2+2\,Bb^2d^2gnx+\left(2\,Babd^2g-Ba^2d^2h\right)n\right)\log\left(bx+a\right)-\left(B\right.}{2\,b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="fricas")
```

```
[Out] 1/2*(A*b^2*d^2*h*x^2 + (2*A*b^2*d^2*g - (B*b^2*c*d - B*a*b*d^2)*h*n)*x + (B
*b^2*d^2*h*n*x^2 + 2*B*b^2*d^2*g*n*x + (2*B*a*b*d^2*g - B*a^2*d^2*h)*n)*log
(b*x + a) - (B*b^2*d^2*h*n*x^2 + 2*B*b^2*d^2*g*n*x + (2*B*b^2*c*d*g - B*b^2
*c^2*h)*n)*log(d*x + c) + (B*b^2*d^2*h*x^2 + 2*B*b^2*d^2*g*x)*log(e))/(b^2*
d^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n))),x)
```

```
[Out] Timed out
```

Giac [A] time = 5.78446, size = 201, normalized size = 1.73

$$\frac{1}{2}(Ah + Bh)x^2 + \frac{1}{2}\left(Bhnx^2 + 2\,Bgnx\right)\log(bx + a) - \frac{1}{2}\left(Bhnx^2 + 2\,Bgnx\right)\log(dx + c) - \frac{\left(Bbchn - Badhn - 2\,Abdg - 2\,Bl\right.}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n))),x, algorithm="giac")
```

```
[Out] 1/2*(A*h + B*h)*x^2 + 1/2*(B*h*n*x^2 + 2*B*g*n*x)*log(b*x + a) - 1/2*(B*h*n
*x^2 + 2*B*g*n*x)*log(d*x + c) - 1/2*(B*b*c*h*n - B*a*d*h*n - 2*A*b*d*g - 2
*B*b*d*g)*x/(b*d) + 1/2*(2*B*a*b*g*n - B*a^2*h*n)*log(b*x + a)/b^2 - 1/2*(2
*B*c*d*g*n - B*c^2*h*n)*log(-d*x - c)/d^2
```

3.297 $\int (A+B\log(e(a+bx)^n(c+dx)^{-n}))\,dx$

Optimal. Leaf size=57

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

```
[Out] A*x - (B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (B*(a + b*x)*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b
```

Rubi [A] time = 0.0299171, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2486, 31}

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}-\frac{Bn(bc-ad)\log(c+dx)}{bd}+Ax$$

Antiderivative was successfully verified.

```
[In] Int[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n],x]
```

```
[Out] A*x - (B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (B*(a + b*x)*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int (A+B\log(e(a+bx)^n(c+dx)^{-n}))\,dx = Ax + B\int \log(e(a+bx)^n(c+dx)^{-n})\,dx$$
$$= Ax + \frac{B(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{b} - \frac{(B(bc-ad)n)\int \frac{1}{c+dx}\,dx}{b}$$
$$= Ax - \frac{B(bc-ad)n\log(c+dx)}{bd} + \frac{B(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{b}$$

Mathematica [A] time = 0.0107576, size = 57, normalized size = 1.

$$\frac{B(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{b} - \frac{Bn(bc-ad)\log(c+dx)}{bd} + Ax$$

Antiderivative was successfully verified.

```
[In] Integrate[A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n],x]
```

```
[Out] A*x - (B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (B*(a + b*x)*Log[(e*(a + b*x)^
n)/(c + d*x)^n])/b
```

Maple [B] time = 0.058, size = 123, normalized size = 2.2

$$Ax + B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)x + \frac{Bna^2\ln(bx+a)\,d}{b(ad-bc)} - \frac{Bna\ln(bx+a)\,c}{ad-bc} - \frac{Bnc\ln(dx+c)\,a}{ad-bc} + \frac{Bnc^2\ln(dx+c)\,b}{d(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)),x)
```

```
[Out] A*x+B*ln(e*(b*x+a)^n/((d*x+c)^n))*x+B*n*a^2/(a*d-b*c)/b*ln(b*x+a)*d-B*n*a/(
a*d-b*c)*ln(b*x+a)*c-B*n*c/(a*d-b*c)*ln(d*x+c)*a+B*n*c^2/(a*d-b*c)/d*ln(d*x
+c)*b
```

Maxima [A] time = 1.12728, size = 80, normalized size = 1.4

$$Bx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + Ax + \frac{\left(\frac{aen\log(bx+a)}{b} - \frac{cen\log(dx+c)}{d}\right)B}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm="maxima")
```

```
[Out] B*x*log((b*x + a)^n*e/(d*x + c)^n) + A*x + (a*e*n*log(b*x + a)/b - c*e*n*lo
g(d*x + c)/d)*B/e
```

Fricas [A] time = 1.03051, size = 146, normalized size = 2.56

$$\frac{Bbdx\log(e) + Abdx + (Bbdnx + Badn)\log(bx + a) - (Bbdnx + Bbcn)\log(dx + c)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm="fricas")
```

```
[Out] (B*b*d*x*log(e) + A*b*d*x + (B*b*d*n*x + B*a*d*n)*log(b*x + a) - (B*b*d*n*x
 + B*b*c*n)*log(d*x + c))/(b*d)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.32551, size = 74, normalized size = 1.3

$$\left(nx\log(bx + a) - nx\log(dx + c) + \frac{an\log(bx + a)}{b} - \frac{cn\log(-dx - c)}{d} + x\right)B + Ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(A+B*log(e*(b*x+a)^n/((d*x+c)^n)),x, algorithm="giac")
```

```
[Out] (n*x*log(b*x + a) - n*x*log(d*x + c) + a*n*log(b*x + a)/b - c*n*log(-d*x -
c)/d + x)*B + A*x
```

3.298 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{g+hx}\,dx$

Optimal. Leaf size=148

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(g+hx)}{bg-ah}\right)}{h}+\frac{Bn\text{PolyLog}\left(2,\frac{d(g+hx)}{dg-ch}\right)}{h}+\frac{\log(g+hx)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h}-\frac{Bn\log(g+hx)}{h}$$

```
[Out] -((B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g + h*x])/h) + (B*n*Log[-((h*(
c + d*x))/(d*g - c*h))]*Log[g + h*x])/h + ((A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])*Log[g + h*x])/h - (B*n*PolyLog[2, (b*(g + h*x))/(b*g - a*h)])/h +
(B*n*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/h
```

Rubi [A] time = 0.188928, antiderivative size = 156, normalized size of antiderivative = 1.05, number of steps used = 9, number of rules used = 5, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {6742, 2494, 2394, 2393, 2391}

$$-\frac{Bn\text{PolyLog}\left(2,\frac{b(g+hx)}{bg-ah}\right)}{h}+\frac{Bn\text{PolyLog}\left(2,\frac{d(g+hx)}{dg-ch}\right)}{h}+\frac{B\log(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}-\frac{Bn\log(g+hx)\log\left(-\right.}{h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x),x]
```

```
[Out] (A*Log[g + h*x])/h - (B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g + h*x])/h
 + (B*n*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/h + (B*Log[(e*(a +
b*x)^n)/(c + d*x)^n]*Log[g + h*x])/h - (B*n*PolyLog[2, (b*(g + h*x))/(b*g -
 a*h)])/h + (B*n*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/h
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\,dx = \int \left(\frac{A}{g+hx}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\right)dx$$

$$= \frac{A\log(g+hx)}{h}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}\,dx$$

$$= \frac{A\log(g+hx)}{h}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\log(g+hx)}{h}-\frac{(bBn)\int \frac{\log(g+hx)}{a+bx}\,dx}{h}$$

$$= \frac{A\log(g+hx)}{h}-\frac{Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)}{h}+\frac{Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log(g+hx)}{h}$$

$$= \frac{A\log(g+hx)}{h}-\frac{Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)}{h}+\frac{Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log(g+hx)}{h}$$

$$= \frac{A\log(g+hx)}{h}-\frac{Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)}{h}+\frac{Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log(g+hx)}{h}$$

Mathematica [A] time = 0.0949328, size = 150, normalized size = 1.01

$$\frac{Bn\left(\text{PolyLog}\left(2,\frac{h(a+bx)}{ah-bg}\right)+\log(a+bx)\log\left(\frac{b(g+hx)}{bg-ah}\right)\right)-Bn\left(\text{PolyLog}\left(2,\frac{h(c+dx)}{ch-dg}\right)+\log(c+dx)\log\left(\frac{d(g+hx)}{dg-ch}\right)\right)+\log(g+h}{h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x),x]
```

```
[Out] ((A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)
^n]))*Log[g + h*x] + B*n*(Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] + Pol
yLog[2, (h*(a + b*x))/(-(b*g) + a*h)]) - B*n*(Log[c + d*x]*Log[(d*(g + h*x)
)/(d*g - c*h)] + PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)]))/h
```

Maple [C] time = 0.783, size = 597, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x)
```

```
[Out] 1/2*I*ln(h*x+g)/h*B*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+
1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/
2*I*ln(h*x+g)/h*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^2-1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)+1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*e)*csgn(I*e/((d
*x+c)^n)*(b*x+a)^n)^2-1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^3-1/2*I*ln(h*x+g)/h*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-1/2*I*ln(h*x+g)/
h*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+
ln(h*x+g)/h*B*ln(e)+A*ln(h*x+g)/h+B*ln(h*x+g)/h*ln((b*x+a)^n)-B/h*n*dilog((
b*(h*x+g)+a*h-b*g)/(a*h-b*g))-B/h*n*ln(h*x+g)*ln((b*(h*x+g)+a*h-b*g)/(a*h-b
*g))-B*ln(h*x+g)/h*ln((d*x+c)^n)+B/h*n*dilog((d*(h*x+g)+c*h-d*g)/(c*h-d*g))
+B/h*n*ln(h*x+g)*ln((d*(h*x+g)+c*h-d*g)/(c*h-d*g))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B\int -\frac{\log\left((bx+a)^{n}\right) - \log\left((dx+c)^{n}\right) + \log\left(e\right)}{hx+g}\,dx + \frac{A\log\left(hx+g\right)}{h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x, algorithm="maxima")
```

```
[Out] -B*integrate(-(log((b*x + a)^n) - log((d*x + c)^n) + log(e))/(h*x + g), x)
+ A*log(h*x + g)/h
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{hx+g},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x, algorithm="fricas")
```

```
[Out] integral((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(h*x + g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)/(h*x + g), x)
```

3.299 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2}\,dx$

Optimal. Leaf size=120

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{h(g+hx)}+\frac{Bn(bc-ad)\log(g+hx)}{(bg-ah)(dg-ch)}+\frac{bBn\log(a+bx)}{h(bg-ah)}-\frac{Bdn\log(c+dx)}{h(dg-ch)}$$

```
[Out] (b*B*n*Log[a + b*x])/(h*(b*g - a*h)) - (B*d*n*Log[c + d*x])/(h*(d*g - c*h))
 - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(g + h*x)) + (B*(b*c - a*d)*
n*Log[g + h*x])/((b*g - a*h)*(d*g - c*h))
```

Rubi [A] time = 0.119829, antiderivative size = 132, normalized size of antiderivative = 1.1, number of steps used = 6, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {6742, 2490, 36, 31}

$$\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)(bg-ah)}-\frac{Bn(bc-ad)\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{Bn(bc-ad)\log(g+hx)}{(bg-ah)(dg-ch)}-\frac{A}{h(g+hx)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^2,x]
```

```
[Out] -(A/(h*(g + h*x))) - (B*(b*c - a*d)*n*Log[c + d*x])/((b*g - a*h)*(d*g - c*h
)) + (B*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a*h)*(g + h*x))
 + (B*(b*c - a*d)*n*Log[g + h*x])/((b*g - a*h)*(d*g - c*h))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\,dx &= \int \left(\frac{A}{(g+hx)^2}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\right)dx\\
&= -\frac{A}{h(g+hx)}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}\,dx\\
&= -\frac{A}{h(g+hx)}+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}-\frac{(B(bc-ad)n)\int \frac{1}{(c+dx)(g+hx}}{bg-ah}\\
&= -\frac{A}{h(g+hx)}+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}-\frac{(Bd(bc-ad)n)\int \frac{1}{c+dx}\,dx}{(bg-ah)(dg-ch)}\\
&= -\frac{A}{h(g+hx)}-\frac{B(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{B(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(bg-ah)(g+hx)}+
\end{aligned}
$$

Mathematica [A] time = 0.224986, size = 117, normalized size = 0.98

$$
\frac{-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{g+hx}+\frac{Bn(b\log(a+bx)(dg-ch)+\log(c+dx)(adh-bdg)+h(bc-ad)\log(g+hx))}{(bg-ah)(dg-ch)}-\frac{A}{g+hx}}{h}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^2,x]
```

```
[Out] (-(A/(g + h*x)) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x) + (B*n*(b*
(d*g - c*h)*Log[a + b*x] + (-(b*d*g) + a*d*h)*Log[c + d*x] + (b*c - a*d)*h*
Log[g + h*x]))/((b*g - a*h)*(d*g - c*h)))/h
```

Maple [C] time = 0.486, size = 1796, normalized size = 15.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x)
```

```
[Out] B/h/(h*x+g)*ln((d*x+c)^n)-1/2*(I*B*Pi*a*d*h*csgn(I*e)*csgn(I*(b*x+a)^n/((d*
x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)*g-2*A*a*d*h*g-2*A*b*c*h*g+2*A*b*d*
g^2+2*A*a*c*h^2-I*B*Pi*b*c*h*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^2*g-I*B*Pi*b*c*h*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g-I*
B*Pi*b*c*h*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*
g-I*B*Pi*a*c*h^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)+I*B*Pi*b*d*g^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^2-2*B*ln(e)*a*d*h*g-2*B*ln(e)*b*c*h*g+2*B*a*c*h^2*ln((b*x+a
)^n)+2*B*b*d*g^2*ln((b*x+a)^n)+2*B*ln(e)*a*c*h^2+2*B*ln(e)*b*d*g^2+I*B*Pi*a
*d*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*g+
I*B*Pi*b*c*h*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)*g-2*B*a*d*g*h*ln((b*x+a)^n)-2*B*b*c*g*h*ln((b*x+a)^n)-2*B*ln(-b*x
-a)*b*d*g*h*n*x-I*B*Pi*b*d*g^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B*Pi*b*d*g
^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*B*Pi*b*d*g^2*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a*c*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)^2+I*B*Pi*a*c*h^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))
^2+I*B*Pi*a*c*h^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*P
i*a*c*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I
*B*Pi*b*c*h*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*g+I*B*Pi*b*c*h*csgn(I*e/((d*x+c
)^n)*(b*x+a)^n)^3*g+I*B*Pi*b*d*g^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n
)^2+I*B*Pi*b*d*g^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi
*b*c*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*
g-I*B*Pi*a*d*h*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g-I*B*Pi
*a*d*h*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*g-I*
B*Pi*b*c*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*g-I*B*Pi*b*d*g^2*csg
n(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*Pi
*b*d*g^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n)
)-I*B*Pi*a*c*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d
*x+c)^n))-I*B*Pi*a*d*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2*g-I*B*Pi
*a*d*h*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*g-2*B*ln(-b*x-a)*b
*d*g^2*n+2*B*ln(-d*x-c)*b*d*g^2*n+I*B*Pi*a*d*h*csgn(I*(b*x+a)^n/((d*x+c)^n)
)^3*g+I*B*Pi*a*d*h*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3*g+2*B*ln(-b*x-a)*b*c*h
^2*n*x+2*B*ln(h*x+g)*a*d*h^2*n*x-2*B*ln(h*x+g)*b*c*h^2*n*x-2*B*ln(-d*x-c)*a
*d*h^2*n*x+2*B*ln(-b*x-a)*b*c*g*h*n+2*B*ln(h*x+g)*a*d*g*h*n-2*B*ln(h*x+g)*b
*c*g*h*n-2*B*ln(-d*x-c)*a*d*g*h*n-I*B*Pi*a*c*h^2*csgn(I*(b*x+a)^n/((d*x+c)^
n))^3-I*B*Pi*a*c*h^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*B*ln(-d*x-c)*b*d*g
```

*h*n*x)/(h*x+g)/(a*c*h^2-a*d*g*h-b*c*g*h+b*d*g^2)/h

Maxima [A] time = 1.1812, size = 204, normalized size = 1.7

$$\frac{\left(\frac{ben\log(bx+a)}{bgh-ah^2}-\frac{den\log(dx+c)}{dgh-ch^2}-\frac{(bcen-aden)\log(hx+g)}{(dgh-ch^2)a-(dg^2-cgh)b}\right)B}{e}-\frac{B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)}{h^2x+gh}-\frac{A}{h^2x+gh}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x, algorithm="maxima
")
```

```
[Out] (b*e*n*log(b*x + a)/(b*g*h - a*h^2) - d*e*n*log(d*x + c)/(d*g*h - c*h^2) -
(b*c*e*n - a*d*e*n)*log(h*x + g)/((d*g*h - c*h^2)*a - (d*g^2 - c*g*h)*b))*B
/e - B*log((b*x + a)^n*e/(d*x + c)^n)/(h^2*x + g*h) - A/(h^2*x + g*h)
```

Fricas [B] time = 18.5281, size = 551, normalized size = 4.59

$$-\frac{Abdg^2+Aach^2-(Abc+Aad)gh-\left(\left(Bbdgh-Bbch^2\right)nx+\left(Badgh-Bach^2\right)n\right)\log(bx+a)+\left(\left(Bbdgh-Badh^2\right)nx+\left(\right.\right.}{bdg^3h+acgh^3-(bc+ad)g^2h}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x, algorithm="fricas
")
```

```
[Out] -(A*b*d*g^2 + A*a*c*h^2 - (A*b*c + A*a*d)*g*h - ((B*b*d*g*h - B*b*c*h^2)*n*
x + (B*a*d*g*h - B*a*c*h^2)*n)*log(b*x + a) + ((B*b*d*g*h - B*a*d*h^2)*n*x
+ (B*b*c*g*h - B*a*c*h^2)*n)*log(d*x + c) - ((B*b*c - B*a*d)*h^2*n*x + (B*b
*c - B*a*d)*g*h*n)*log(h*x + g) + (B*b*d*g^2 + B*a*c*h^2 - (B*b*c + B*a*d)*
g*h)*log(e))/(b*d*g^3*h + a*c*g*h^3 - (b*c + a*d)*g^2*h^2 + (b*d*g^2*h^2 +
a*c*h^4 - (b*c + a*d)*g*h^3)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.47081, size = 224, normalized size = 1.87

$$\frac{Bb^2n\log\left(|-bx-a|\right)}{b^2gh-abh^2}-\frac{Bd^2n\log\left(|dx+c|\right)}{d^2gh-cdh^2}-\frac{Bn\log\left(bx+a\right)}{h^2x+gh}+\frac{Bn\log\left(dx+c\right)}{h^2x+gh}+\frac{\left(Bbcn-Badn\right)\log\left(hx+g\right)}{bdg^2-bcgh-adgh+ach^2}-\frac{A+B}{h^2x+g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^2,x, algorithm="giac")
```

```
[Out] B*b^2*n*log(abs(-b*x - a))/(b^2*g*h - a*b*h^2) - B*d^2*n*log(abs(d*x + c))/
(d^2*g*h - c*d*h^2) - B*n*log(b*x + a)/(h^2*x + g*h) + B*n*log(d*x + c)/(h^
2*x + g*h) + (B*b*c*n - B*a*d*n)*log(h*x + g)/(b*d*g^2 - b*c*g*h - a*d*g*h
+ a*c*h^2) - (A + B)/(h^2*x + g*h)
```

3.300 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^3}\,dx$

Optimal. Leaf size=191

$$-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{2h(g+hx)^2}+\frac{b^2Bn\log(a+bx)}{2h(bg-ah)^2}-\frac{Bn(bc-ad)}{2(g+hx)(bg-ah)(dg-ch)}+\frac{Bn(bc-ad)\log(g+hx)(-adh-}{2(bg-ah)^2(dg-ch)^2}$$

```
[Out] -(B*(b*c - a*d)*n)/(2*(b*g - a*h)*(d*g - c*h)*(g + h*x)) + (b^2*B*n*Log[a +
 b*x])/(2*h*(b*g - a*h)^2) - (B*d^2*n*Log[c + d*x])/(2*h*(d*g - c*h)^2) - (
A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h*(g + h*x)^2) + (B*(b*c - a*d)*
(2*b*d*g - b*c*h - a*d*h)*n*Log[g + h*x])/(2*(b*g - a*h)^2*(d*g - c*h)^2)
```

Rubi [A] time = 0.300838, antiderivative size = 203, normalized size of antiderivative = 1.06, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$\frac{b^2Bn\log(a+bx)}{2h(bg-ah)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2}-\frac{Bn(bc-ad)}{2(g+hx)(bg-ah)(dg-ch)}+\frac{Bn(bc-ad)\log(g+hx)(-adh-bch+}{2(bg-ah)^2(dg-ch)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^3,x]
```

```
[Out] -A/(2*h*(g + h*x)^2) - (B*(b*c - a*d)*n)/(2*(b*g - a*h)*(d*g - c*h)*(g + h*
x)) + (b^2*B*n*Log[a + b*x])/(2*h*(b*g - a*h)^2) - (B*d^2*n*Log[c + d*x])/(
2*h*(d*g - c*h)^2) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h*(g + h*x)^2)
 + (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[g + h*x])/(2*(b*g - a*h)^
2*(d*g - c*h)^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
```

```
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\begin{aligned}\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\,dx &= \int\left(\frac{A}{(g+hx)^3}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\right)dx\\
&= -\frac{A}{2h(g+hx)^2}+B\int\frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^3}\,dx\\
&= -\frac{A}{2h(g+hx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2}+\frac{(B(bc-ad)n)\int\frac{1}{(a+bx)(c+dx)(g+h}}{2h}\\
&= -\frac{A}{2h(g+hx)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h(g+hx)^2}+\frac{(B(bc-ad)n)\int\left(\frac{b^3}{(bc-ad)(bg-ah)^2(}\right.}{}\\
&= -\frac{A}{2h(g+hx)^2}-\frac{B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)}+\frac{b^2Bn\log(a+bx)}{2h(bg-ah)^2}-\frac{Bd^2n\log(}{2h(dg-}\end{aligned}$$

Mathematica [A] time = 0.733684, size = 178, normalized size = 0.93

$$-\frac{Bn(bc-ad)\left(\frac{\frac{d^2\log(c+dx)}{bc-ad}+\frac{h\left(\frac{(bg-ah)(dg-ch)}{g+hx}+\log(g+hx)(adh+bch-2bdg)\right)}{(bg-ah)^2}}{(dg-ch)^2}-\frac{b^2\log(a+bx)}{(bc-ad)(bg-ah)^2}\right)+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^2}+\frac{A}{(g+hx)^2}}{2h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^3,x]
```

```
[Out] -(A/(g + h*x)^2 + (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^2 + B*(b*c
 - a*d)*n*(-((b^2*Log[a + b*x])/((b*c - a*d)*(b*g - a*h)^2)) + ((d^2*Log[c
+ d*x])/(b*c - a*d) + (h*(((b*g - a*h)*(d*g - c*h))/(g + h*x) + (-2*b*d*g +
 b*c*h + a*d*h)*Log[g + h*x]))/(b*g - a*h)^2)/(d*g - c*h)^2))/(2*h)
```

Maple [C] time = 0.69, size = 4925, normalized size = 25.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x)
```

```
[Out] 1/2*B/h/(h*x+g)^2*ln((d*x+c)^n)-1/4*(-2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*(b*x+a)
^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*I*B*Pi*a*b*c^2*g*h^3*csgn(I*(b*x+a)^n
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*I*B*Pi*a*b*c^2*g*h^3*csgn(I*(b*x+a)^n)*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*a^2*c*d*g*h^3*cs
gn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*P
i*a^2*c^2*h^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-2*I*B*Pi*a*b*d^2*g^3*h*csgn
(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*B*ln(e)*a^2*c^2*h^4+2*B*ln(
e)*b^2*d^2*g^4+2*A*a^2*c^2*h^4+2*A*b^2*d^2*g^4-I*B*Pi*b^2*d^2*g^4*csgn(I*(b
*x+a)^n/((d*x+c)^n))^3-I*B*Pi*b^2*d^2*g^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3
-I*B*Pi*a^2*c^2*h^4*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-2*I*B*Pi*a*b*c^2*g*h^3*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*B*a^2*d^2*g^2*h^2*n-2
*B*b^2*c^2*g^2*h^2*n-4*B*ln(e)*a^2*c*d*g*h^3-4*B*ln(e)*a*b*c^2*g*h^3-4*B*ln
(e)*a*b*d^2*g^3*h-4*B*ln(e)*b^2*c*d*g^3*h+2*A*a^2*d^2*g^2*h^2+2*A*b^2*c^2*g
^2*h^2+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-2*I*B*Pi*b^2*
c*d*g^3*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*a^2*c^2*h^4*cs
gn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*a^2*c^2*h^4*csgn(I*(b*x+a)
^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a^2*c^2*h^4*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a^2*c^2*h^4*csgn(I*(b*x+a)^n/((d*x+c
)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*b^2*d^2*g^4*csgn(I*e)*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*a*b*c^2*g*h^3*csgn(I*(b*x+a)^n/((d*x+c
)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*(b*x+
a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+8*A*a*b*c*d*g^2*h^2-2*I
*B*Pi*a^2*c*d*g*h^3*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*I
*B*Pi*a*b*d^2*g^3*h*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*I*B*Pi*b^2*c*d*g^3*
h*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+2*B*a^2*c^2*h^4*ln((b*x+a)^n)+2*B*b^2*d^2
*g^4*ln((b*x+a)^n)-2*B*ln(b*x+a)*b^2*d^2*g^4*n+2*B*ln(-d*x-c)*b^2*d^2*g^4*n
-I*B*Pi*b^2*d^2*g^4*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)-I*B*Pi*b^2*d^2*g^4*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*c
sgn(I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*(b*x+a)^n)*csgn(
I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*
(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I/((
d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*e)
*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*b^2*d
^2*g^4*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2*d^2*g^4
*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*B*Pi*b^2*d^2*g^4*csg
```

n(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*a^2*d^2
*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-2*B*a^2*c*d*g*h^3*n+2*B*a*b*c^2*g*
h^3*n-2*B*a*b*d^2*g^3*h*n+2*B*b^2*c*d*g^3*h*n+8*B*a*b*c*d*g^2*h^2*ln((b*x+a
)^n)+4*B*ln(b*x+a)*b^2*c*d*g*h^3*n*x^2+4*B*ln(-h*x-g)*a*b*d^2*g*h^3*n*x^2-4
*B*ln(-h*x-g)*b^2*c*d*g*h^3*n*x^2-4*B*ln(-d*x-c)*a*b*d^2*g*h^3*n*x^2+8*B*ln
(b*x+a)*b^2*c*d*g^2*h^2*n*x+8*B*ln(-h*x-g)*a*b*d^2*g^2*h^2*n*x-8*B*ln(-h*x-
g)*b^2*c*d*g^2*h^2*n*x-8*B*ln(-d*x-c)*a*b*d^2*g^2*h^2*n*x-2*B*a^2*c*d*h^4*n
*x+2*B*a^2*d^2*g*h^3*n*x+2*B*a*b*c^2*h^4*n*x-2*B*b^2*c^2*g*h^3*n*x-4*I*B*Pi
*a*b*c*d*g^2*h^2*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)-4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n)
)*csgn(I*(b*x+a)^n/((d*x+c)^n))-2*B*ln(b*x+a)*b^2*c^2*h^4*n*x^2-2*B*ln(-h*x
-g)*a^2*d^2*h^4*n*x^2+2*B*ln(-h*x-g)*b^2*c^2*h^4*n*x^2+2*B*ln(-d*x-c)*a^2*d
^2*h^4*n*x^2-2*B*ln(b*x+a)*b^2*c^2*g^2*h^2*n-2*B*ln(-h*x-g)*a^2*d^2*g^2*h^2
*n+2*B*ln(-h*x-g)*b^2*c^2*g^2*h^2*n+2*B*ln(-d*x-c)*a^2*d^2*g^2*h^2*n+2*I*B*
Pi*a*b*c^2*g*h^3*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^
n)*(b*x+a)^n)+2*B*a^2*d^2*g^2*h^2*ln((b*x+a)^n)+2*B*b^2*c^2*g^2*h^2*ln((b*x
+a)^n)+I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^2+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)^2-I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))-2*I*B*Pi*b^2*c*d*g^3*h*csgn(I/((d*x+c)^n))*csgn(
I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^3-2*B*ln(b*x+a)*b^2*d^2*g^2*h^2*n*x^2+2*B*ln(-d*x-c)*b^2*d^2*g^2*h^2
*n*x^2-4*B*ln(b*x+a)*b^2*c^2*g*h^3*n*x-4*B*ln(b*x+a)*b^2*d^2*g^3*h*n*x-4*B*
ln(-h*x-g)*a^2*d^2*g*h^3*n*x+4*B*ln(-h*x-g)*b^2*c^2*g*h^3*n*x+4*B*ln(-d*x-c
)*a^2*d^2*g*h^3*n*x+4*B*ln(-d*x-c)*b^2*d^2*g^3*h*n*x+4*B*ln(b*x+a)*b^2*c*d*
g^3*h*n+4*B*ln(-h*x-g)*a*b*d^2*g^3*h*n-4*B*ln(-h*x-g)*b^2*c*d*g^3*h*n-4*B*l
n(-d*x-c)*a*b*d^2*g^3*h*n-4*A*a^2*c*d*g*h^3-4*A*a*b*c^2*g*h^3-4*A*a*b*d^2*g
^3*h-4*A*b^2*c*d*g^3*h-I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))
^3-I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-4*B*a*b*d^2*g^3
*h*ln((b*x+a)^n)-4*B*b^2*c*d*g^3*h*ln((b*x+a)^n)-4*B*a^2*c*d*g*h^3*ln((b*x+
a)^n)-4*B*a*b*c^2*g*h^3*ln((b*x+a)^n)-I*B*Pi*a^2*c^2*h^4*csgn(I*e)*csgn(I*(
b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*Pi*a^2*c^2*h^4*cs
gn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*
a^2*c*d*g*h^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+8*B*ln(e)*a*b*c*d*g^2*h^2+2*I
*B*Pi*b^2*c*d*g^3*h*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-2*B*a*b*d^2*g^2*h^2*n
*x+2*B*b^2*c*d*g^2*h^2*n*x-I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*e)*csgn(I*(b*x+a)^
n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I*B*Pi*a^2*d^2*g^2*h^2*csgn(
I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)+2*B*ln(e
)*a^2*d^2*g^2*h^2+2*B*ln(e)*b^2*c^2*g^2*h^2-4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I
*(b*x+a)^n/((d*x+c)^n))^3-4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)^3-2*I*B*Pi*b^2*c*d*g^3*h*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c
)^n))^2-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x
+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(
b*x+a)^n)^2+I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^2+I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*e)*csgn(I*e/((d*x+c)^

```
n)*(b*x+a)^n)^2+I*B*Pi*b^2*c^2*g^2*h^2*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n
/((d*x+c)^n))^2+I*B*Pi*b^2*c^2*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/(
(d*x+c)^n))^2+2*I*B*Pi*b^2*c*d*g^3*h*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*
csgn(I*(b*x+a)^n/((d*x+c)^n))+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*e)*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^2+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I*(
b*x+a)^n/((d*x+c)^n))^2+4*I*B*Pi*a*b*c*d*g^2*h^2*csgn(I/((d*x+c)^n))*csgn(I
*(b*x+a)^n/((d*x+c)^n))^2+2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*(b*x+a)^n)*csgn(I/(
(d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+2*I*B*Pi*b^2*c*d*g^3*h*csgn(I*e)*
csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-2*I*B*Pi*a*b*
c^2*g*h^3*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-2*I*B*Pi*b^2*c*d*g^3*
h*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+4*I*B*Pi*
a*b*c*d*g^2*h^2*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^
n)^2-I*B*Pi*a^2*d^2*g^2*h^2*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b
*x+a)^n/((d*x+c)^n))-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I*e)*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)^2-2*I*B*Pi*a*b*d^2*g^3*h*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((
d*x+c)^n))^2+2*I*B*Pi*a^2*c*d*g*h^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+2*I*B
*Pi*a*b*c^2*g*h^3*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+2*I*B*Pi*a*b*c^2*g*h^3*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^3)/(h*x+g)^2/(a*c*h^2-a*d*g*h-b*c*g*h+b*d*g^2
)/(-c*h+d*g)/(-a*h+b*g)/h
```

Maxima [B] time = 2.42682, size = 516, normalized size = 2.7

$$\frac{\left(\frac{b^2en\log(bx+a)}{b^2g^2h-2\,abgh^2+a^2h^3} - \frac{d^2en\log(dx+c)}{d^2g^2h-2\,cdgh^2+c^2h^3} - \frac{\left(2\,abd^2egn-a^2d^2ehn-\left(2\,cdegn-c^2ehn\right)b^2\right)\log\left(hx+g\right)}{\left(d^2g^2h^2-2\,cdgh^3+c^2h^4\right)a^2-2\left(d^2g^3h-2\,cdg^2h^2+c^2gh^3\right)ab+\left(d^2g^4-2\,cdg^3h+c^2g^2h^2\right)b^2} + \frac{}{\left(dg^2h-cgh^2\right)a-\left(dg^3-\right.}}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x, algorithm="maxima
")
```

```
[Out] 1/2*(b^2*e*n*log(b*x + a)/(b^2*g^2*h - 2*a*b*g*h^2 + a^2*h^3) - d^2*e*n*log
(d*x + c)/(d^2*g^2*h - 2*c*d*g*h^2 + c^2*h^3) - (2*a*b*d^2*e*g*n - a^2*d^2*
e*h*n - (2*c*d*e*g*n - c^2*e*h*n)*b^2)*log(h*x + g)/((d^2*g^2*h^2 - 2*c*d*g
*h^3 + c^2*h^4)*a^2 - 2*(d^2*g^3*h - 2*c*d*g^2*h^2 + c^2*g*h^3)*a*b + (d^2*
g^4 - 2*c*d*g^3*h + c^2*g^2*h^2)*b^2) + (b*c*e*n - a*d*e*n)/((d*g^2*h - c*g
*h^2)*a - (d*g^3 - c*g^2*h)*b + ((d*g*h^2 - c*h^3)*a - (d*g^2*h - c*g*h^2)*
b)*x))*B/e - 1/2*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^3*x^2 + 2*g*h^2*x + g^
2*h) - 1/2*A/(h^3*x^2 + 2*g*h^2*x + g^2*h)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x, algorithm="fricas
")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.87964, size = 1197, normalized size = 6.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^3,x, algorithm="giac")
```

```
[Out] -1/2*B*n*log(b*x + a)/(h^3*x^2 + 2*g*h^2*x + g^2*h) + 1/2*B*n*log(d*x + c)/
(h^3*x^2 + 2*g*h^2*x + g^2*h) + 1/2*(2*B*b^2*c*d*g*n - 2*B*a*b*d^2*g*n - B*
b^2*c^2*h*n + B*a^2*d^2*h*n)*log(h*x + g)/(b^2*d^2*g^4 - 2*b^2*c*d*g^3*h -
2*a*b*d^2*g^3*h + b^2*c^2*g^2*h^2 + 4*a*b*c*d*g^2*h^2 + a^2*d^2*g^2*h^2 - 2
*a*b*c^2*g*h^3 - 2*a^2*c*d*g*h^3 + a^2*c^2*h^4) - 1/4*(2*B*b^2*c*d*g*n - 2*
B*a*b*d^2*g*n - B*b^2*c^2*h*n + B*a^2*d^2*h*n)*log(abs(b*d*x^2 + b*c*x + a*
d*x + a*c))/(b^2*d^2*g^4 - 2*b^2*c*d*g^3*h - 2*a*b*d^2*g^3*h + b^2*c^2*g^2*
h^2 + 4*a*b*c*d*g^2*h^2 + a^2*d^2*g^2*h^2 - 2*a*b*c^2*g*h^3 - 2*a^2*c*d*g*h
^3 + a^2*c^2*h^4) - 1/2*(B*b*c*h^2*n*x - B*a*d*h^2*n*x + B*b*c*g*h*n - B*a*
d*g*h*n + A*b*d*g^2 + B*b*d*g^2 - A*b*c*g*h - B*b*c*g*h - A*a*d*g*h - B*a*d
```

```
*g*h + A*a*c*h^2 + B*a*c*h^2)/(b*d*g^2*h^3*x^2 - b*c*g*h^4*x^2 - a*d*g*h^4*
x^2 + a*c*h^5*x^2 + 2*b*d*g^3*h^2*x - 2*b*c*g^2*h^3*x - 2*a*d*g^2*h^3*x + 2
*a*c*g*h^4*x + b*d*g^4*h - b*c*g^3*h^2 - a*d*g^3*h^2 + a*c*g^2*h^3) + 1/4*(
2*B*b^3*c*d^2*g^2*n - 2*B*a*b^2*d^3*g^2*n - 2*B*b^3*c^2*d*g*h*n + 2*B*a^2*b
*d^3*g*h*n + B*b^3*c^3*h^2*n - B*a*b^2*c^2*d*h^2*n + B*a^2*b*c*d^2*h^2*n -
B*a^3*d^3*h^2*n)*log(abs((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x +
 b*c + a*d + abs(-b*c + a*d))))/((b^2*d^2*g^4*h - 2*b^2*c*d*g^3*h^2 - 2*a*b
*d^2*g^3*h^2 + b^2*c^2*g^2*h^3 + 4*a*b*c*d*g^2*h^3 + a^2*d^2*g^2*h^3 - 2*a*
b*c^2*g*h^4 - 2*a^2*c*d*g*h^4 + a^2*c^2*h^5)*abs(-b*c + a*d))
```

3.301 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^4}\,dx$

Optimal. Leaf size=284

$$\frac{Bn(bc-ad)\log(g+hx)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{3(bg-ah)^3(dg-ch)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A}{3h(g+hx)^3}+\frac{b}{}$$

```
[Out] -(B*(b*c - a*d)*n)/(6*(b*g - a*h)*(d*g - c*h)*(g + h*x)^2) - (B*(b*c - a*d)
*(2*b*d*g - b*c*h - a*d*h)*n)/(3*(b*g - a*h)^2*(d*g - c*h)^2*(g + h*x)) + (
b^3*B*n*Log[a + b*x])/(3*h*(b*g - a*h)^3) - (B*d^3*n*Log[c + d*x])/(3*h*(d*
g - c*h)^3) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*h*(g + h*x)^3) +
(B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h) + b^2*(3*d^2*g^2 - 3*c*
d*g*h + c^2*h^2))*n*Log[g + h*x])/(3*(b*g - a*h)^3*(d*g - c*h)^3)
```

Rubi [A] time = 0.536117, antiderivative size = 296, normalized size of antiderivative = 1.04, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$\frac{Bn(bc-ad)\log(g+hx)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{3(bg-ah)^3(dg-ch)^3}+\frac{b^3Bn\log(a+bx)}{3h(bg-ah)^3}-\frac{B\log\left(e(a+bx)^n\right.}{3h(g+h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^4,x]
```

```
[Out] -A/(3*h*(g + h*x)^3) - (B*(b*c - a*d)*n)/(6*(b*g - a*h)*(d*g - c*h)*(g + h*
x)^2) - (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n)/(3*(b*g - a*h)^2*(d*g -
 c*h)^2*(g + h*x)) + (b^3*B*n*Log[a + b*x])/(3*h*(b*g - a*h)^3) - (B*d^3*n*
Log[c + d*x])/(3*h*(d*g - c*h)^3) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3
*h*(g + h*x)^3) + (B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h) + b^2
*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n*Log[g + h*x])/(3*(b*g - a*h)^3*(d*g -
 c*h)^3)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^4}\,dx = \int \left(\frac{A}{(g+hx)^4}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^4}\right)dx$$

$$= -\frac{A}{3h(g+hx)^3}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^4}\,dx$$

$$= -\frac{A}{3h(g+hx)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h(g+hx)^3}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)(g+hx)^{}}}{3h}$$

$$= -\frac{A}{3h(g+hx)^3}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h(g+hx)^3}+\frac{(B(bc-ad)n)\int \left(\frac{b^4}{(bc-ad)(bg-ah)^3(a}\right.}{}$$

$$= -\frac{A}{3h(g+hx)^3}-\frac{B(bc-ad)n}{6(bg-ah)(dg-ch)(g+hx)^2}-\frac{B(bc-ad)(2bdg-bch-adh)n}{3(bg-ah)^2(dg-ch)^2(g+hx)}$$

Mathematica [A] time = 1.34277, size = 273, normalized size = 0.96

$$-\frac{Bn(bc-ad)\left(-\frac{2h\log(g+hx)\left(a^2d^2h^2+abdh(ch-3dg)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{(bg-ah)^3(dg-ch)^3}-\frac{2b^3\log(a+bx)}{(bc-ad)(bg-ah)^3}+\frac{2d^3\log(c+dx)}{(bc-ad)(dg-ch)^3}-\frac{2h(adh+bch-2bdg)}{(g+hx)(bg-ah)^2(dg-ch)^2}+\right.}{6h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^4,x]
```

```
[Out] -((2*A)/(g + h*x)^3 + (2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^3 +
B*(b*c - a*d)*n*(h/((b*g - a*h)*(d*g - c*h)*(g + h*x)^2) - (2*h*(-2*b*d*g +
```

```
 b*c*h + a*d*h))/((b*g - a*h)^2*(d*g - c*h)^2*(g + h*x)) - (2*b^3*Log[a + b
*x])/((b*c - a*d)*(b*g - a*h)^3) + (2*d^3*Log[c + d*x])/((b*c - a*d)*(d*g -
 c*h)^3) - (2*h*(a^2*d^2*h^2 + a*b*d*h*(-3*d*g + c*h) + b^2*(3*d^2*g^2 - 3*
c*d*g*h + c^2*h^2))*Log[g + h*x])/((b*g - a*h)^3*(d*g - c*h)^3)))/(6*h)
```

Maple [C] time = 0.925, size = 9645, normalized size = 34.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 1.63639, size = 1242, normalized size = 4.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x, algorithm="maxima
")
```

```
[Out] 1/6*(2*b^3*e*n*log(b*x + a)/(b^3*g^3*h - 3*a*b^2*g^2*h^2 + 3*a^2*b*g*h^3 -
a^3*h^4) - 2*d^3*e*n*log(d*x + c)/(d^3*g^3*h - 3*c*d^2*g^2*h^2 + 3*c^2*d*g*
h^3 - c^3*h^4) + 2*(3*a*b^2*d^3*e*g^2*n - 3*a^2*b*d^3*e*g*h*n + a^3*d^3*e*h
^2*n - (3*c*d^2*e*g^2*n - 3*c^2*d*e*g*h*n + c^3*e*h^2*n)*b^3)*log(h*x + g)/
((d^3*g^3*h^3 - 3*c*d^2*g^2*h^4 + 3*c^2*d*g*h^5 - c^3*h^6)*a^3 - 3*(d^3*g^4
*h^2 - 3*c*d^2*g^3*h^3 + 3*c^2*d*g^2*h^4 - c^3*g*h^5)*a^2*b + 3*(d^3*g^5*h
- 3*c*d^2*g^4*h^2 + 3*c^2*d*g^3*h^3 - c^3*g^2*h^4)*a*b^2 - (d^3*g^6 - 3*c*d
^2*g^5*h + 3*c^2*d*g^4*h^2 - c^3*g^3*h^3)*b^3) - ((3*d^2*e*g*h*n - c*d*e*h^
2*n)*a^2 - (5*d^2*e*g^2*n - c^2*e*h^2*n)*a*b + (5*c*d*e*g^2*n - 3*c^2*e*g*h
*n)*b^2 - 2*(2*a*b*d^2*e*g*h*n - a^2*d^2*e*h^2*n - (2*c*d*e*g*h*n - c^2*e*h
^2*n)*b^2)*x)/((d^2*g^4*h^2 - 2*c*d*g^3*h^3 + c^2*g^2*h^4)*a^2 - 2*(d^2*g^5
*h - 2*c*d*g^4*h^2 + c^2*g^3*h^3)*a*b + (d^2*g^6 - 2*c*d*g^5*h + c^2*g^4*h^
2)*b^2 + ((d^2*g^2*h^4 - 2*c*d*g*h^5 + c^2*h^6)*a^2 - 2*(d^2*g^3*h^3 - 2*c*
d*g^2*h^4 + c^2*g*h^5)*a*b + (d^2*g^4*h^2 - 2*c*d*g^3*h^3 + c^2*g^2*h^4)*b^
2)*x^2 + 2*((d^2*g^3*h^3 - 2*c*d*g^2*h^4 + c^2*g*h^5)*a^2 - 2*(d^2*g^4*h^2
```

```
- 2*c*d*g^3*h^3 + c^2*g^2*h^4)*a*b + (d^2*g^5*h - 2*c*d*g^4*h^2 + c^2*g^3*h
^3)*b^2)*x))*B/e - 1/3*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^4*x^3 + 3*g*h^3*
x^2 + 3*g^2*h^2*x + g^3*h) - 1/3*A/(h^4*x^3 + 3*g*h^3*x^2 + 3*g^2*h^2*x + g
^3*h)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x, algorithm="fricas
")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 4.52414, size = 2041, normalized size = 7.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^4,x, algorithm="giac")
```

```
[Out] 1/3*B*b^4*n*log(abs(b*x + a))/(b^4*g^3*h - 3*a*b^3*g^2*h^2 + 3*a^2*b^2*g*h^
3 - a^3*b*h^4) - 1/3*B*d^4*n*log(abs(d*x + c))/(d^4*g^3*h - 3*c*d^3*g^2*h^2
 + 3*c^2*d^2*g*h^3 - c^3*d*h^4) - 1/3*B*n*log(b*x + a)/(h^4*x^3 + 3*g*h^3*x
```

```
^2 + 3*g^2*h^2*x + g^3*h) + 1/3*B*n*log(d*x + c)/(h^4*x^3 + 3*g*h^3*x^2 + 3
*g^2*h^2*x + g^3*h) + 1/3*(3*B*b^3*c*d^2*g^2*n - 3*B*a*b^2*d^3*g^2*n - 3*B*
b^3*c^2*d*g*h*n + 3*B*a^2*b*d^3*g*h*n + B*b^3*c^3*h^2*n - B*a^3*d^3*h^2*n)*
log(h*x + g)/(b^3*d^3*g^6 - 3*b^3*c*d^2*g^5*h - 3*a*b^2*d^3*g^5*h + 3*b^3*c
^2*d*g^4*h^2 + 9*a*b^2*c*d^2*g^4*h^2 + 3*a^2*b*d^3*g^4*h^2 - b^3*c^3*g^3*h^
3 - 9*a*b^2*c^2*d*g^3*h^3 - 9*a^2*b*c*d^2*g^3*h^3 - a^3*d^3*g^3*h^3 + 3*a*b
^2*c^3*g^2*h^4 + 9*a^2*b*c^2*d*g^2*h^4 + 3*a^3*c*d^2*g^2*h^4 - 3*a^2*b*c^3*
g*h^5 - 3*a^3*c^2*d*g*h^5 + a^3*c^3*h^6) - 1/6*(4*B*b^2*c*d*g*h^3*n*x^2 - 4
*B*a*b*d^2*g*h^3*n*x^2 - 2*B*b^2*c^2*h^4*n*x^2 + 2*B*a^2*d^2*h^4*n*x^2 + 9*
B*b^2*c*d*g^2*h^2*n*x - 9*B*a*b*d^2*g^2*h^2*n*x - 5*B*b^2*c^2*g*h^3*n*x + 5
*B*a^2*d^2*g*h^3*n*x + B*a*b*c^2*h^4*n*x - B*a^2*c*d*h^4*n*x + 5*B*b^2*c*d*
g^3*h*n - 5*B*a*b*d^2*g^3*h*n - 3*B*b^2*c^2*g^2*h^2*n + 3*B*a^2*d^2*g^2*h^2
*n + B*a*b*c^2*g*h^3*n - B*a^2*c*d*g*h^3*n + 2*A*b^2*d^2*g^4 + 2*B*b^2*d^2*
g^4 - 4*A*b^2*c*d*g^3*h - 4*B*b^2*c*d*g^3*h - 4*A*a*b*d^2*g^3*h - 4*B*a*b*d
^2*g^3*h + 2*A*b^2*c^2*g^2*h^2 + 2*B*b^2*c^2*g^2*h^2 + 8*A*a*b*c*d*g^2*h^2
+ 8*B*a*b*c*d*g^2*h^2 + 2*A*a^2*d^2*g^2*h^2 + 2*B*a^2*d^2*g^2*h^2 - 4*A*a*b
*c^2*g*h^3 - 4*B*a*b*c^2*g*h^3 - 4*A*a^2*c*d*g*h^3 - 4*B*a^2*c*d*g*h^3 + 2*
A*a^2*c^2*h^4 + 2*B*a^2*c^2*h^4)/(b^2*d^2*g^4*h^4*x^3 - 2*b^2*c*d*g^3*h^5*x
^3 - 2*a*b*d^2*g^3*h^5*x^3 + b^2*c^2*g^2*h^6*x^3 + 4*a*b*c*d*g^2*h^6*x^3 +
a^2*d^2*g^2*h^6*x^3 - 2*a*b*c^2*g*h^7*x^3 - 2*a^2*c*d*g*h^7*x^3 + a^2*c^2*h
^8*x^3 + 3*b^2*d^2*g^5*h^3*x^2 - 6*b^2*c*d*g^4*h^4*x^2 - 6*a*b*d^2*g^4*h^4*
x^2 + 3*b^2*c^2*g^3*h^5*x^2 + 12*a*b*c*d*g^3*h^5*x^2 + 3*a^2*d^2*g^3*h^5*x^
2 - 6*a*b*c^2*g^2*h^6*x^2 - 6*a^2*c*d*g^2*h^6*x^2 + 3*a^2*c^2*g*h^7*x^2 + 3
*b^2*d^2*g^6*h^2*x - 6*b^2*c*d*g^5*h^3*x - 6*a*b*d^2*g^5*h^3*x + 3*b^2*c^2*
g^4*h^4*x + 12*a*b*c*d*g^4*h^4*x + 3*a^2*d^2*g^4*h^4*x - 6*a*b*c^2*g^3*h^5*
x - 6*a^2*c*d*g^3*h^5*x + 3*a^2*c^2*g^2*h^6*x + b^2*d^2*g^7*h - 2*b^2*c*d*g
^6*h^2 - 2*a*b*d^2*g^6*h^2 + b^2*c^2*g^5*h^3 + 4*a*b*c*d*g^5*h^3 + a^2*d^2*
g^5*h^3 - 2*a*b*c^2*g^4*h^4 - 2*a^2*c*d*g^4*h^4 + a^2*c^2*g^3*h^5)
```

3.302 $\int \frac{A+B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^5}\,dx$

Optimal. Leaf size=389

$$-\frac{Bn(bc-ad)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{4(g+hx)(bg-ah)^3(dg-ch)^3}-\frac{Bn(bc-ad)\log(g+hx)(-adh-bch+2bdg)\left(-a\right.}{4(bg-ah)}$$

```
[Out] -(B*(b*c - a*d)*n)/(12*(b*g - a*h)*(d*g - c*h)*(g + h*x)^3) - (B*(b*c - a*d
)*(2*b*d*g - b*c*h - a*d*h)*n)/(8*(b*g - a*h)^2*(d*g - c*h)^2*(g + h*x)^2)
- (B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h) + b^2*(3*d^2*g^2 - 3*
c*d*g*h + c^2*h^2))*n)/(4*(b*g - a*h)^3*(d*g - c*h)^3*(g + h*x)) + (b^4*B*n
*Log[a + b*x])/(4*h*(b*g - a*h)^4) - (B*d^4*n*Log[c + d*x])/(4*h*(d*g - c*h
)^4) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*h*(g + h*x)^4) - (B*(b*c
 - a*d)*(2*b*d*g - b*c*h - a*d*h)*(2*a*b*d^2*g*h - a^2*d^2*h^2 - b^2*(2*d^2
*g^2 - 2*c*d*g*h + c^2*h^2))*n*Log[g + h*x])/(4*(b*g - a*h)^4*(d*g - c*h)^4
)
```

Rubi [A] time = 0.820968, antiderivative size = 401, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {6742, 2492, 72}

$$-\frac{Bn(bc-ad)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{4(g+hx)(bg-ah)^3(dg-ch)^3}-\frac{Bn(bc-ad)\log(g+hx)(-adh-bch+2bdg)\left(-a\right.}{4(bg-ah)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^5,x]
```

```
[Out] -A/(4*h*(g + h*x)^4) - (B*(b*c - a*d)*n)/(12*(b*g - a*h)*(d*g - c*h)*(g + h
*x)^3) - (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n)/(8*(b*g - a*h)^2*(d*g
- c*h)^2*(g + h*x)^2) - (B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h)
 + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n)/(4*(b*g - a*h)^3*(d*g - c*h)^3
*(g + h*x)) + (b^4*B*n*Log[a + b*x])/(4*h*(b*g - a*h)^4) - (B*d^4*n*Log[c +
 d*x])/(4*h*(d*g - c*h)^4) - (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(4*h*(g +
 h*x)^4) - (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*(2*a*b*d^2*g*h - a^2*d^
2*h^2 - b^2*(2*d^2*g^2 - 2*c*d*g*h + c^2*h^2))*n*Log[g + h*x])/(4*(b*g - a*
h)^4*(d*g - c*h)^4)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rubi steps

$$\int \frac{A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^5}\,dx = \int \left(\frac{A}{(g+hx)^5}+\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^5}\right)dx$$

$$= -\frac{A}{4h(g+hx)^4}+B\int \frac{\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)^5}\,dx$$

$$= -\frac{A}{4h(g+hx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h(g+hx)^4}+\frac{(B(bc-ad)n)\int \frac{1}{(a+bx)(c+dx)(g+h\ldots}}{4h}$$

$$= -\frac{A}{4h(g+hx)^4}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{4h(g+hx)^4}+\frac{(B(bc-ad)n)\int \left(\frac{b^5}{(bc-ad)(bg-ah)^4(\ldots}\right.}{\ldots}$$

$$= -\frac{A}{4h(g+hx)^4}-\frac{B(bc-ad)n}{12(bg-ah)(dg-ch)(g+hx)^3}-\frac{B(bc-ad)(2bdg-bch-adh\ldots}{8(bg-ah)^2(dg-ch)^2(g+hx\ldots}$$

Mathematica [A] time = 1.47082, size = 366, normalized size = 0.94

$$-\frac{-Bn(bc-ad)\left(-\frac{h\left(a^2d^2h^2+abdh(ch-3dg)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)}{(g+hx)(bg-ah)^3(dg-ch)^3}-\frac{h\log(g+hx)(adh+bch-2bdg)\left(a^2d^2h^2-2abd^2gh+b^2\left(c^2h^2-2cdgh+2d^2g^2\right)\right)}{(bg-ah)^4(dg-ch)^4}+\frac{b^4\ldots}{(bc-\ldots}\right.}{4h}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^5,x]
```

```
[Out] -(A/(g + h*x)^4 + (B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(g + h*x)^4 - B*(b*c
 - a*d)*n*(-h/(3*(b*g - a*h)*(d*g - c*h)*(g + h*x)^3) + (h*(-2*b*d*g + b*c*
h + a*d*h))/(2*(b*g - a*h)^2*(d*g - c*h)^2*(g + h*x)^2) - (h*(a^2*d^2*h^2 +
 a*b*d*h*(-3*d*g + c*h) + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2)))/((b*g - a
*h)^3*(d*g - c*h)^3*(g + h*x)) + (b^4*Log[a + b*x])/((b*c - a*d)*(b*g - a*h
)^4) - (d^4*Log[c + d*x])/((b*c - a*d)*(d*g - c*h)^4) - (h*(-2*b*d*g + b*c*
h + a*d*h)*(-2*a*b*d^2*g*h + a^2*d^2*h^2 + b^2*(2*d^2*g^2 - 2*c*d*g*h + c^2
*h^2))*Log[g + h*x])/((b*g - a*h)^4*(d*g - c*h)^4)))/(4*h)
```

Maple [C] time = 1.286, size = 16077, normalized size = 41.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 2.13105, size = 2581, normalized size = 6.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x, algorithm="maxima
")
```

```
[Out] 1/24*(6*b^4*e*n*log(b*x + a)/(b^4*g^4*h - 4*a*b^3*g^3*h^2 + 6*a^2*b^2*g^2*h
^3 - 4*a^3*b*g*h^4 + a^4*h^5) - 6*d^4*e*n*log(d*x + c)/(d^4*g^4*h - 4*c*d^3
*g^3*h^2 + 6*c^2*d^2*g^2*h^3 - 4*c^3*d*g*h^4 + c^4*h^5) - 6*(4*a*b^3*d^4*e*
g^3*n - 6*a^2*b^2*d^4*e*g^2*h*n + 4*a^3*b*d^4*e*g*h^2*n - a^4*d^4*e*h^3*n -
 (4*c*d^3*e*g^3*n - 6*c^2*d^2*e*g^2*h*n + 4*c^3*d*e*g*h^2*n - c^4*e*h^3*n)*
b^4)*log(h*x + g)/((d^4*g^4*h^4 - 4*c*d^3*g^3*h^5 + 6*c^2*d^2*g^2*h^6 - 4*c
^3*d*g*h^7 + c^4*h^8)*a^4 - 4*(d^4*g^5*h^3 - 4*c*d^3*g^4*h^4 + 6*c^2*d^2*g^
3*h^5 - 4*c^3*d*g^2*h^6 + c^4*g*h^7)*a^3*b + 6*(d^4*g^6*h^2 - 4*c*d^3*g^5*h
^3 + 6*c^2*d^2*g^4*h^4 - 4*c^3*d*g^3*h^5 + c^4*g^2*h^6)*a^2*b^2 - 4*(d^4*g^
```

```
7*h - 4*c*d^3*g^6*h^2 + 6*c^2*d^2*g^5*h^3 - 4*c^3*d*g^4*h^4 + c^4*g^3*h^5)*
a*b^3 + (d^4*g^8 - 4*c*d^3*g^7*h + 6*c^2*d^2*g^6*h^2 - 4*c^3*d*g^5*h^3 + c^
4*g^4*h^4)*b^4) - ((11*d^3*e*g^2*h^2*n - 7*c*d^2*e*g*h^3*n + 2*c^2*d*e*h^4*
n)*a^3 - (31*d^3*e*g^3*h*n - 15*c*d^2*e*g^2*h^2*n + 2*c^3*e*h^4*n)*a^2*b +
(26*d^3*e*g^4*n - 15*c^2*d*e*g^2*h^2*n + 7*c^3*e*g*h^3*n)*a*b^2 - (26*c*d^2
*e*g^4*n - 31*c^2*d*e*g^3*h*n + 11*c^3*e*g^2*h^2*n)*b^3 + 6*(3*a*b^2*d^3*e*
g^2*h^2*n - 3*a^2*b*d^3*e*g*h^3*n + a^3*d^3*e*h^4*n - (3*c*d^2*e*g^2*h^2*n
- 3*c^2*d*e*g*h^3*n + c^3*e*h^4*n)*b^3)*x^2 + 3*((5*d^3*e*g*h^3*n - c*d^2*e
*h^4*n)*a^3 - 3*(5*d^3*e*g^2*h^2*n - c*d^2*e*g*h^3*n)*a^2*b + (14*d^3*e*g^3
*h*n - 3*c^2*d*e*g*h^3*n + c^3*e*h^4*n)*a*b^2 - (14*c*d^2*e*g^3*h*n - 15*c^
2*d*e*g^2*h^2*n + 5*c^3*e*g*h^3*n)*b^3)*x)/((d^3*g^6*h^3 - 3*c*d^2*g^5*h^4
+ 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*a^3 - 3*(d^3*g^7*h^2 - 3*c*d^2*g^6*h^3 + 3
*c^2*d*g^5*h^4 - c^3*g^4*h^5)*a^2*b + 3*(d^3*g^8*h - 3*c*d^2*g^7*h^2 + 3*c^
2*d*g^6*h^3 - c^3*g^5*h^4)*a*b^2 - (d^3*g^9 - 3*c*d^2*g^8*h + 3*c^2*d*g^7*h
^2 - c^3*g^6*h^3)*b^3 + ((d^3*g^3*h^6 - 3*c*d^2*g^2*h^7 + 3*c^2*d*g*h^8 - c
^3*h^9)*a^3 - 3*(d^3*g^4*h^5 - 3*c*d^2*g^3*h^6 + 3*c^2*d*g^2*h^7 - c^3*g*h^
8)*a^2*b + 3*(d^3*g^5*h^4 - 3*c*d^2*g^4*h^5 + 3*c^2*d*g^3*h^6 - c^3*g^2*h^7
)*a*b^2 - (d^3*g^6*h^3 - 3*c*d^2*g^5*h^4 + 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*b
^3)*x^3 + 3*((d^3*g^4*h^5 - 3*c*d^2*g^3*h^6 + 3*c^2*d*g^2*h^7 - c^3*g*h^8)*
a^3 - 3*(d^3*g^5*h^4 - 3*c*d^2*g^4*h^5 + 3*c^2*d*g^3*h^6 - c^3*g^2*h^7)*a^2
*b + 3*(d^3*g^6*h^3 - 3*c*d^2*g^5*h^4 + 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*a*b^
2 - (d^3*g^7*h^2 - 3*c*d^2*g^6*h^3 + 3*c^2*d*g^5*h^4 - c^3*g^4*h^5)*b^3)*x^
2 + 3*((d^3*g^5*h^4 - 3*c*d^2*g^4*h^5 + 3*c^2*d*g^3*h^6 - c^3*g^2*h^7)*a^3
- 3*(d^3*g^6*h^3 - 3*c*d^2*g^5*h^4 + 3*c^2*d*g^4*h^5 - c^3*g^3*h^6)*a^2*b +
 3*(d^3*g^7*h^2 - 3*c*d^2*g^6*h^3 + 3*c^2*d*g^5*h^4 - c^3*g^4*h^5)*a*b^2 -
(d^3*g^8*h - 3*c*d^2*g^7*h^2 + 3*c^2*d*g^6*h^3 - c^3*g^5*h^4)*b^3)*x))*B/e
- 1/4*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x
^2 + 4*g^3*h^2*x + g^4*h) - 1/4*A/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x^2 +
4*g^3*h^2*x + g^4*h)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x, algorithm="fricas
")
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))/(h*x+g)**5,x)
```

```
[Out] Timed out
```

Giac [B] time = 14.5972, size = 5925, normalized size = 15.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))/(h*x+g)^5,x, algorithm="giac")
```

```
[Out] -1/4*B*n*log(b*x + a)/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x^2 + 4*g^3*h^2*x
+ g^4*h) + 1/4*B*n*log(d*x + c)/(h^5*x^4 + 4*g*h^4*x^3 + 6*g^2*h^3*x^2 + 4*
g^3*h^2*x + g^4*h) + 1/4*(4*B*b^4*c*d^3*g^3*n - 4*B*a*b^3*d^4*g^3*n - 6*B*b
^4*c^2*d^2*g^2*h*n + 6*B*a^2*b^2*d^4*g^2*h*n + 4*B*b^4*c^3*d*g*h^2*n - 4*B*
a^3*b*d^4*g*h^2*n - B*b^4*c^4*h^3*n + B*a^4*d^4*h^3*n)*log(h*x + g)/(b^4*d^
4*g^8 - 4*b^4*c*d^3*g^7*h - 4*a*b^3*d^4*g^7*h + 6*b^4*c^2*d^2*g^6*h^2 + 16*
a*b^3*c*d^3*g^6*h^2 + 6*a^2*b^2*d^4*g^6*h^2 - 4*b^4*c^3*d*g^5*h^3 - 24*a*b^
3*c^2*d^2*g^5*h^3 - 24*a^2*b^2*c*d^3*g^5*h^3 - 4*a^3*b*d^4*g^5*h^3 + b^4*c^
4*g^4*h^4 + 16*a*b^3*c^3*d*g^4*h^4 + 36*a^2*b^2*c^2*d^2*g^4*h^4 + 16*a^3*b*
c*d^3*g^4*h^4 + a^4*d^4*g^4*h^4 - 4*a*b^3*c^4*g^3*h^5 - 24*a^2*b^2*c^3*d*g^
3*h^5 - 24*a^3*b*c^2*d^2*g^3*h^5 - 4*a^4*c*d^3*g^3*h^5 + 6*a^2*b^2*c^4*g^2*
h^6 + 16*a^3*b*c^3*d*g^2*h^6 + 6*a^4*c^2*d^2*g^2*h^6 - 4*a^3*b*c^4*g*h^7 -
4*a^4*c^3*d*g*h^7 + a^4*c^4*h^8) - 1/8*(4*B*b^4*c*d^3*g^3*n - 4*B*a*b^3*d^4
*g^3*n - 6*B*b^4*c^2*d^2*g^2*h*n + 6*B*a^2*b^2*d^4*g^2*h*n + 4*B*b^4*c^3*d*
g*h^2*n - 4*B*a^3*b*d^4*g*h^2*n - B*b^4*c^4*h^3*n + B*a^4*d^4*h^3*n)*log(ab
s(b*d*x^2 + b*c*x + a*d*x + a*c))/(b^4*d^4*g^8 - 4*b^4*c*d^3*g^7*h - 4*a*b^
3*d^4*g^7*h + 6*b^4*c^2*d^2*g^6*h^2 + 16*a*b^3*c*d^3*g^6*h^2 + 6*a^2*b^2*d^
4*g^6*h^2 - 4*b^4*c^3*d*g^5*h^3 - 24*a*b^3*c^2*d^2*g^5*h^3 - 24*a^2*b^2*c*d
^3*g^5*h^3 - 4*a^3*b*d^4*g^5*h^3 + b^4*c^4*g^4*h^4 + 16*a*b^3*c^3*d*g^4*h^4
 + 36*a^2*b^2*c^2*d^2*g^4*h^4 + 16*a^3*b*c*d^3*g^4*h^4 + a^4*d^4*g^4*h^4 -
4*a*b^3*c^4*g^3*h^5 - 24*a^2*b^2*c^3*d*g^3*h^5 - 24*a^3*b*c^2*d^2*g^3*h^5 -
 4*a^4*c*d^3*g^3*h^5 + 6*a^2*b^2*c^4*g^2*h^6 + 16*a^3*b*c^3*d*g^2*h^6 + 6*a
^4*c^2*d^2*g^2*h^6 - 4*a^3*b*c^4*g*h^7 - 4*a^4*c^3*d*g*h^7 + a^4*c^4*h^8) -
 1/24*(18*B*b^3*c*d^2*g^2*h^4*n*x^3 - 18*B*a*b^2*d^3*g^2*h^4*n*x^3 - 18*B*b
```

^3*c^2*d*g*h^5*n*x^3 + 18*B*a^2*b*d^3*g*h^5*n*x^3 + 6*B*b^3*c^3*h^6*n*x^3 - 6*B*a^3*d^3*h^6*n*x^3 + 60*B*b^3*c*d^2*g^3*h^3*n*x^2 - 60*B*a*b^2*d^3*g^3*h^3*n*x^2 - 63*B*b^3*c^2*d*g^2*h^4*n*x^2 + 63*B*a^2*b*d^3*g^2*h^4*n*x^2 + 21*B*b^3*c^3*g*h^5*n*x^2 + 9*B*a*b^2*c^2*d*g*h^5*n*x^2 - 9*B*a^2*b*c*d^2*g*h^5*n*x^2 - 21*B*a^3*d^3*g*h^5*n*x^2 - 3*B*a*b^2*c^3*h^6*n*x^2 + 3*B*a^3*c*d^2*h^6*n*x^2 + 68*B*b^3*c*d^2*g^4*h^2*n*x - 68*B*a*b^2*d^3*g^4*h^2*n*x - 76*B*b^3*c^2*d*g^3*h^3*n*x + 76*B*a^2*b*d^3*g^3*h^3*n*x + 26*B*b^3*c^3*g^2*h^4*n*x + 24*B*a*b^2*c^2*d*g^2*h^4*n*x - 24*B*a^2*b*c*d^2*g^2*h^4*n*x - 26*B*a^3*d^3*g^2*h^4*n*x - 10*B*a*b^2*c^3*g*h^5*n*x + 10*B*a^3*c*d^2*g*h^5*n*x + 2*B*a^2*b*c^3*h^6*n*x - 2*B*a^3*c^2*d*h^6*n*x + 26*B*b^3*c*d^2*g^5*h*n - 26*B*a*b^2*d^3*g^5*h*n - 31*B*b^3*c^2*d*g^4*h^2*n + 31*B*a^2*b*d^3*g^4*h^2*n + 11*B*b^3*c^3*g^3*h^3*n + 15*B*a*b^2*c^2*d*g^3*h^3*n - 15*B*a^2*b*c*d^2*g^3*h^3*n - 11*B*a^3*d^3*g^3*h^3*n - 7*B*a*b^2*c^3*g^2*h^4*n + 7*B*a^3*c*d^2*g^2*h^4*n + 2*B*a^2*b*c^3*g*h^5*n - 2*B*a^3*c^2*d*g*h^5*n + 6*A*b^3*d^3*g^6 + 6*B*b^3*d^3*g^6 - 18*A*b^3*c*d^2*g^5*h - 18*B*b^3*c*d^2*g^5*h - 18*A*a*b^2*d^3*g^5*h - 18*B*a*b^2*d^3*g^5*h + 18*A*b^3*c^2*d*g^4*h^2 + 18*B*b^3*c^2*d*g^4*h^2 + 54*A*a*b^2*c*d^2*g^4*h^2 + 54*B*a*b^2*c*d^2*g^4*h^2 + 18*A*a^2*b*d^3*g^4*h^2 + 18*B*a^2*b*d^3*g^4*h^2 - 6*A*b^3*c^3*g^3*h^3 - 6*B*b^3*c^3*g^3*h^3 - 54*A*a*b^2*c^2*d*g^3*h^3 - 54*B*a*b^2*c^2*d*g^3*h^3 - 54*A*a^2*b*c*d^2*g^3*h^3 - 54*B*a^2*b*c*d^2*g^3*h^3 - 6*A*a^3*d^3*g^3*h^3 - 6*B*a^3*d^3*g^3*h^3 + 18*A*a*b^2*c^3*g^2*h^4 + 18*B*a*b^2*c^3*g^2*h^4 + 54*A*a^2*b*c^2*d*g^2*h^4 + 54*B*a^2*b*c^2*d*g^2*h^4 + 18*A*a^3*c*d^2*g^2*h^4 + 18*B*a^3*c*d^2*g^2*h^4 - 18*A*a^2*b*c^3*g*h^5 - 18*B*a^2*b*c^3*g*h^5 - 18*A*a^3*c^2*d*g*h^5 - 18*B*a^3*c^2*d*g*h^5 + 6*A*a^3*c^3*h^6 + 6*B*a^3*c^3*h^6)/(b^3*d^3*g^6*h^5*x^4 - 3*b^3*c*d^2*g^5*h^6*x^4 - 3*a*b^2*d^3*g^5*h^6*x^4 + 3*b^3*c^2*d*g^4*h^7*x^4 + 9*a*b^2*c*d^2*g^4*h^7*x^4 + 3*a^2*b*d^3*g^4*h^7*x^4 - b^3*c^3*g^3*h^8*x^4 - 9*a*b^2*c^2*d*g^3*h^8*x^4 - 9*a^2*b*c*d^2*g^3*h^8*x^4 - a^3*d^3*g^3*h^8*x^4 + 3*a*b^2*c^3*g^2*h^9*x^4 + 9*a^2*b*c^2*d*g^2*h^9*x^4 + 3*a^3*c*d^2*g^2*h^9*x^4 - 3*a^2*b*c^3*g*h^10*x^4 - 3*a^3*c^2*d*g*h^10*x^4 + a^3*c^3*h^11*x^4 + 4*b^3*d^3*g^7*h^4*x^3 - 12*b^3*c*d^2*g^6*h^5*x^3 - 12*a*b^2*d^3*g^6*h^5*x^3 + 12*b^3*c^2*d*g^5*h^6*x^3 + 36*a*b^2*c*d^2*g^5*h^6*x^3 + 12*a^2*b*d^3*g^5*h^6*x^3 - 4*b^3*c^3*g^4*h^7*x^3 - 36*a*b^2*c^2*d*g^4*h^7*x^3 - 36*a^2*b*c*d^2*g^4*h^7*x^3 - 4*a^3*d^3*g^4*h^7*x^3 + 12*a*b^2*c^3*g^3*h^8*x^3 + 36*a^2*b*c^2*d*g^3*h^8*x^3 + 12*a^3*c*d^2*g^3*h^8*x^3 - 12*a^2*b*c^3*g^2*h^9*x^3 - 12*a^3*c^2*d*g^2*h^9*x^3 + 4*a^3*c^3*g*h^10*x^3 + 6*b^3*d^3*g^8*h^3*x^2 - 18*b^3*c*d^2*g^7*h^4*x^2 - 18*a*b^2*d^3*g^7*h^4*x^2 + 18*b^3*c^2*d*g^6*h^5*x^2 + 54*a*b^2*c*d^2*g^6*h^5*x^2 + 18*a^2*b*d^3*g^6*h^5*x^2 - 6*b^3*c^3*g^5*h^6*x^2 - 54*a*b^2*c^2*d*g^5*h^6*x^2 - 54*a^2*b*c*d^2*g^5*h^6*x^2 - 6*a^3*d^3*g^5*h^6*x^2 + 18*a*b^2*c^3*g^4*h^7*x^2 + 54*a^2*b*c^2*d*g^4*h^7*x^2 + 18*a^3*c*d^2*g^4*h^7*x^2 - 18*a^2*b*c^3*g^3*h^8*x^2 - 18*a^3*c^2*d*g^3*h^8*x^2 + 6*a^3*c^3*g^2*h^9*x^2 + 4*b^3*d^3*g^9*h^2*x - 12*b^3*c*d^2*g^8*h^3*x - 12*a*b^2*d^3*g^8*h^3*x + 12*b^3*c^2*d*g^7*h^4*x + 36*a*b^2*c*d^2*g^7*h^4*x + 12*a^2*b*d^3*g^7*h^4*x - 4*b^3*c^3*g^6*h^5*x - 36*a*b^2*c^2*d*g^6*h^5*x - 36*a^2*b*c*d^2*g^6*h^5*x - 4*a^3*d^3*g^6*h^5*x + 12*a*b^2*c^3*g^5*h^6*x + 36*a^2*b*c^2*d*g^5*h^6*x + 12*a^3*c*d^2*g^5*h^6*x

```
 - 12*a^2*b*c^3*g^4*h^7*x - 12*a^3*c^2*d*g^4*h^7*x + 4*a^3*c^3*g^3*h^8*x +
b^3*d^3*g^10*h - 3*b^3*c*d^2*g^9*h^2 - 3*a*b^2*d^3*g^9*h^2 + 3*b^3*c^2*d*g^
8*h^3 + 9*a*b^2*c*d^2*g^8*h^3 + 3*a^2*b*d^3*g^8*h^3 - b^3*c^3*g^7*h^4 - 9*a
*b^2*c^2*d*g^7*h^4 - 9*a^2*b*c*d^2*g^7*h^4 - a^3*d^3*g^7*h^4 + 3*a*b^2*c^3*
g^6*h^5 + 9*a^2*b*c^2*d*g^6*h^5 + 3*a^3*c*d^2*g^6*h^5 - 3*a^2*b*c^3*g^5*h^6
 - 3*a^3*c^2*d*g^5*h^6 + a^3*c^3*g^4*h^7) + 1/8*(2*B*b^5*c*d^4*g^4*n - 2*B*
a*b^4*d^5*g^4*n - 4*B*b^5*c^2*d^3*g^3*h*n + 4*B*a^2*b^3*d^5*g^3*h*n + 6*B*b
^5*c^3*d^2*g^2*h^2*n - 6*B*a*b^4*c^2*d^3*g^2*h^2*n + 6*B*a^2*b^3*c*d^4*g^2*
h^2*n - 6*B*a^3*b^2*d^5*g^2*h^2*n - 4*B*b^5*c^4*d*g*h^3*n + 4*B*a*b^4*c^3*d
^2*g*h^3*n - 4*B*a^3*b^2*c*d^4*g*h^3*n + 4*B*a^4*b*d^5*g*h^3*n + B*b^5*c^5*
h^4*n - B*a*b^4*c^4*d*h^4*n + B*a^4*b*c*d^4*h^4*n - B*a^5*d^5*h^4*n)*log(ab
s((2*b*d*x + b*c + a*d - abs(-b*c + a*d))/(2*b*d*x + b*c + a*d + abs(-b*c +
 a*d))))/((b^4*d^4*g^8*h - 4*b^4*c*d^3*g^7*h^2 - 4*a*b^3*d^4*g^7*h^2 + 6*b^
4*c^2*d^2*g^6*h^3 + 16*a*b^3*c*d^3*g^6*h^3 + 6*a^2*b^2*d^4*g^6*h^3 - 4*b^4*
c^3*d*g^5*h^4 - 24*a*b^3*c^2*d^2*g^5*h^4 - 24*a^2*b^2*c*d^3*g^5*h^4 - 4*a^3
*b*d^4*g^5*h^4 + b^4*c^4*g^4*h^5 + 16*a*b^3*c^3*d*g^4*h^5 + 36*a^2*b^2*c^2*
d^2*g^4*h^5 + 16*a^3*b*c*d^3*g^4*h^5 + a^4*d^4*g^4*h^5 - 4*a*b^3*c^4*g^3*h^
6 - 24*a^2*b^2*c^3*d*g^3*h^6 - 24*a^3*b*c^2*d^2*g^3*h^6 - 4*a^4*c*d^3*g^3*h
^6 + 6*a^2*b^2*c^4*g^2*h^7 + 16*a^3*b*c^3*d*g^2*h^7 + 6*a^4*c^2*d^2*g^2*h^7
 - 4*a^3*b*c^4*g*h^8 - 4*a^4*c^3*d*g*h^8 + a^4*c^4*h^9)*abs(-b*c + a*d))
```

3.303 $\int (g+hx)^2 \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx$

Optimal. Leaf size=570

$$\frac{2B^2n^2(bc-ad)\left(a^2d^2h^2-abdh(3dg-ch)+b^2\left(c^2h^2-3cdgh+3d^2g^2\right)\right)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3b^3d^3}+\frac{2Bn(bc-ad)\left(a^2d^2h^2-\right.}{}$$

```
[Out] (B^2*(b*c - a*d)^2*h^2*n^2*x)/(3*b^2*d^2) + (B^2*(b*c - a*d)^3*h^2*n^2*Log[
(a + b*x)/(c + d*x)])/(3*b^3*d^3) + (B^2*(b*c - a*d)^3*h^2*n^2*Log[c + d*x]
)/(3*b^3*d^3) + (2*B^2*(b*c - a*d)^2*h*(3*b*d*g - 2*b*c*h - a*d*h)*n^2*Log[
c + d*x])/(3*b^3*d^3) - (2*B*(b*c - a*d)*h*(3*b*d*g - 2*b*c*h - a*d*h)*n*(a
 + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(3*b^3*d^2) - (B*(b*c - a
*d)*h^2*n*(c + d*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(3*b*d^3) +
 (2*B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h) + b^2*(3*d^2*g^2 - 3
*c*d*g*h + c^2*h^2))*n*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*
x)^n)/(c + d*x)^n]))/(3*b^3*d^3) - ((b*g - a*h)^3*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])^2)/(3*b^3*h) + ((g + h*x)^3*(A + B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n])^2)/(3*h) + (2*B^2*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h
) + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n^2*PolyLog[2, (d*(a + b*x))/(b*
(c + d*x))])/(3*b^3*d^3)
```

Rubi [A] time = 1.29385, antiderivative size = 697, normalized size of antiderivative = 1.22, number of steps used = 23, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{2B^2n^2(bg-ah)^3\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{3b^3h}-\frac{2B^2n^2(dg-ch)^3\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{3d^3h}+\frac{a^2B^2h^2n^2(bc-ad)\log(a+bx)}{3b^3d}-$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-2*A*B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(3*b^2*d^2) + (B^2*(b*
c - a*d)^2*h^2*n^2*x)/(3*b^2*d^2) - (A*B*(b*c - a*d)*h^2*n*x^2)/(3*b*d) + (
A^2*(g + h*x)^3)/(3*h) - (2*A*B*(b*g - a*h)^3*n*Log[a + b*x])/(3*b^3*h) + (
a^2*B^2*(b*c - a*d)*h^2*n^2*Log[a + b*x])/(3*b^3*d) + (2*A*B*(d*g - c*h)^3*
n*Log[c + d*x])/(3*d^3*h) - (B^2*c^2*(b*c - a*d)*h^2*n^2*Log[c + d*x])/(3*b
*d^3) + (2*B^2*(b*c - a*d)^2*h*(3*b*d*g - b*c*h - a*d*h)*n^2*Log[c + d*x])/
(3*b^3*d^3) - (B^2*(b*c - a*d)*h^2*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/
(3*b*d) - (2*B^2*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*(a + b*x)*Log[(e
*(a + b*x)^n)/(c + d*x)^n])/(3*b^3*d^2) + (2*A*B*(g + h*x)^3*Log[(e*(a + b*
```

```
x)^n)/(c + d*x)^n])/(3*h) + (2*B^2*(b*g - a*h)^3*n*Log[-((b*c - a*d)/(d*(a
+ b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*b^3*h) - (2*B^2*(d*g - c*h)^
3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(3*d^3
*h) + (B^2*(g + h*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(3*h) - (2*B^2*(
d*g - c*h)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(3*d^3*h) - (2*B^
2*(b*g - a*h)^3*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(3*b^3*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (g+hx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2(g+hx)^2+2AB(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)+B^2(g+\right.$$

$$= \frac{A^2(g+hx)^3}{3h}+(2AB)\int (g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx+B$$

$$= \frac{A^2(g+hx)^3}{3h}+\frac{2AB(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h}+\frac{B^2(g+h}{}$$

$$= \frac{A^2(g+hx)^3}{3h}+\frac{2AB(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{3h}+\frac{B^2(g+h}{}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}-\frac{AB(bc-ad)h^2nx^2}{3bd}+\frac{A^2(g}{}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}-\frac{AB(bc-ad)h^2nx^2}{3bd}+\frac{A^2(g}{}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}-\frac{AB(bc-ad)h^2nx^2}{3bd}+\frac{A^2(g}{}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}+\frac{B^2(bc-ad)^2h^2n^2x}{3b^2d^2}-\frac{AB(b}{}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}+\frac{B^2(bc-ad)^2h^2n^2x}{3b^2d^2}-\frac{AB(b}{}$$

$$= -\frac{2AB(bc-ad)h(3bdg-bch-adh)nx}{3b^2d^2}+\frac{B^2(bc-ad)^2h^2n^2x}{3b^2d^2}-\frac{AB(b}{}$$

Mathematica [A] time = 1.80591, size = 906, normalized size = 1.59

$$\frac{-aB^2\left(3b^2g^2-3abhg+a^2h^2\right)n^2\log^2(a+bx)d^3+Bn\log(a+bx)\left(2Bc\left(3d^2g^2-3cdhg+c^2h^2\right)n\log(c+dx)b^3+2B\left(-c\left(\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (-(a*B^2*d^3*(3*b^2*g^2 - 3*a*b*g*h + a^2*h^2)*n^2*Log[a + b*x]^2) + B*n*Lo
g[a + b*x]*(2*b^3*B*c*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2)*n*Log[c + d*x] + 2*
B*(3*a*b^2*d^3*g^2 - 3*a^2*b*d^3*g*h + a^3*d^3*h^2 - b^3*c*(3*d^2*g^2 - 3*c
```

```
*d*g*h + c^2*h^2))*n*Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(2*A*d^2*(3*b^2*g
^2 - 3*a*b*g*h + a^2*h^2) + B*(-3*a^2*d^2*h^2 + a*b*d*h*(6*d*g + c*h) + 2*b
^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n + 2*B*d^2*(3*b^2*g^2 - 3*a*b*g*h +
a^2*h^2)*Log[(e*(a + b*x)^n)/(c + d*x)^n])) + b*(-(b^2*B^2*c*(3*d^2*g^2 - 3
*c*d*g*h + c^2*h^2)*n^2*Log[c + d*x]^2) + B*n*Log[c + d*x]*(-2*A*b^2*c*(3*d
^2*g^2 - 3*c*d*g*h + c^2*h^2) + B*(2*a^2*c*d^2*h^2 - 3*b^2*c^2*h*(-2*d*g +
c*h) + a*b*d*(-6*d^2*g^2 - 6*c*d*g*h + c^2*h^2))*n - 2*b^2*B*c*(3*d^2*g^2 -
 3*c*d*g*h + c^2*h^2)*Log[(e*(a + b*x)^n)/(c + d*x)^n]) + d*(a^2*B*d^2*h^2*
n*(-2*A + B*n)*x + a*b*B*n*(A*d^2*(-6*g^2 + 6*g*h*x + h^2*x^2) - 2*B*n*(3*d
^2*g^2 + c^2*h^2 + c*d*h*(-3*g + h*x))) + b^2*x*(B^2*c^2*h^2*n^2 + A^2*d^2*
(3*g^2 + 3*g*h*x + h^2*x^2) + A*B*c*h*n*(2*c*h - d*(6*g + h*x))) + B*(-2*a^
2*B*d^2*h^2*n*x + a*b*B*d^2*n*(-6*g^2 + 6*g*h*x + h^2*x^2) + b^2*x*(B*c*h*n
*(-6*d*g + 2*c*h - d*h*x) + 2*A*d^2*(3*g^2 + 3*g*h*x + h^2*x^2)))*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + b^2*B^2*d^2*x*(3*g^2 + 3*g*h*x + h^2*x^2)*Log[(e*
(a + b*x)^n)/(c + d*x)^n]^2)) + 2*B^2*(3*a*b^2*d^3*g^2 - 3*a^2*b*d^3*g*h +
a^3*d^3*h^2 - b^3*c*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n^2*PolyLog[2, (d*(a
 + b*x))/(-(b*c) + a*d)])/(3*b^3*d^3)
```

Maple [C] time = 3.399, size = 22955, normalized size = 40.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 3.83006, size = 2256, normalized size = 3.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxi
ma")
```

```
[Out] 2/3*A*B*h^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^2*h^2*x^3 + 2*A*B*g*
h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^2*g*h*x^2 + 2*A*B*g^2*x*log((b*x +
```

```
 a)^n*e/(d*x + c)^n) + A^2*g^2*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*x
+ c)/d)*A*B*g^2/e - 2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2
+ (b*c*e*n - a*d*e*n)*x/(b*d))*A*B*g*h/e + 1/3*(2*a^3*e*n*log(b*x + a)/b^3
- 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(b^2*c^
2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A*B*h^2/e + 1/3*(2*a^2*c*d^2*h^2*n^2 - (
6*c*d^2*g*h*n^2 - c^2*d*h^2*n^2)*a*b - (6*c*d^2*g^2*n*log(e) + (3*h^2*n^2 +
 2*h^2*n*log(e))*c^3 - 6*(g*h*n^2 + g*h*n*log(e))*c^2*d)*b^2)*B^2*log(d*x +
 c)/(b^2*d^3) + 2/3*(3*a*b^2*d^3*g^2*n^2 - 3*a^2*b*d^3*g*h*n^2 + a^3*d^3*h^
2*n^2 - (3*c*d^2*g^2*n^2 - 3*c^2*d*g*h*n^2 + c^3*h^2*n^2)*b^3)*(log(b*x + a
)*log((b*d*x + a*d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B
^2/(b^3*d^3) + 1/3*(B^2*b^3*d^3*h^2*x^3*log(e)^2 + 2*(3*c*d^2*g^2*n^2 - 3*c
^2*d*g*h*n^2 + c^3*h^2*n^2)*B^2*b^3*log(b*x + a)*log(d*x + c) - (3*c*d^2*g^
2*n^2 - 3*c^2*d*g*h*n^2 + c^3*h^2*n^2)*B^2*b^3*log(d*x + c)^2 + (a*b^2*d^3*
h^2*n*log(e) - (c*d^2*h^2*n*log(e) - 3*d^3*g*h*log(e)^2)*b^3)*B^2*x^2 - (3*
a*b^2*d^3*g^2*n^2 - 3*a^2*b*d^3*g*h*n^2 + a^3*d^3*h^2*n^2)*B^2*log(b*x + a)
^2 + ((h^2*n^2 - 2*h^2*n*log(e))*a^2*b*d^3 - 2*(c*d^2*h^2*n^2 - 3*d^3*g*h*n
*log(e))*a*b^2 - (6*c*d^2*g*h*n*log(e) - 3*d^3*g^2*log(e)^2 - (h^2*n^2 + 2*
h^2*n*log(e))*c^2*d)*b^3)*B^2*x - ((3*h^2*n^2 - 2*h^2*n*log(e))*a^3*d^3 - (
c*d^2*h^2*n^2 + 6*(g*h*n^2 - g*h*n*log(e))*d^3)*a^2*b + 2*(3*c*d^2*g*h*n^2
- c^2*d*h^2*n^2 - 3*d^3*g^2*n*log(e))*a*b^2)*B^2*log(b*x + a) + (B^2*b^3*d^
3*h^2*x^3 + 3*B^2*b^3*d^3*g*h*x^2 + 3*B^2*b^3*d^3*g^2*x)*log((b*x + a)^n)^2
 + (B^2*b^3*d^3*h^2*x^3 + 3*B^2*b^3*d^3*g*h*x^2 + 3*B^2*b^3*d^3*g^2*x)*log(
(d*x + c)^n)^2 + (2*B^2*b^3*d^3*h^2*x^3*log(e) - 2*(3*c*d^2*g^2*n - 3*c^2*d
*g*h*n + c^3*h^2*n)*B^2*b^3*log(d*x + c) + (a*b^2*d^3*h^2*n - (c*d^2*h^2*n
- 6*d^3*g*h*log(e))*b^3)*B^2*x^2 + 2*(3*a*b^2*d^3*g*h*n - a^2*b*d^3*h^2*n -
 (3*c*d^2*g*h*n - c^2*d*h^2*n - 3*d^3*g^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d
^3*g^2*n - 3*a^2*b*d^3*g*h*n + a^3*d^3*h^2*n)*B^2*log(b*x + a))*log((b*x +
a)^n) - (2*B^2*b^3*d^3*h^2*x^3*log(e) - 2*(3*c*d^2*g^2*n - 3*c^2*d*g*h*n +
c^3*h^2*n)*B^2*b^3*log(d*x + c) + (a*b^2*d^3*h^2*n - (c*d^2*h^2*n - 6*d^3*g
*h*log(e))*b^3)*B^2*x^2 + 2*(3*a*b^2*d^3*g*h*n - a^2*b*d^3*h^2*n - (3*c*d^2
*g*h*n - c^2*d*h^2*n - 3*d^3*g^2*log(e))*b^3)*B^2*x + 2*(3*a*b^2*d^3*g^2*n
- 3*a^2*b*d^3*g*h*n + a^3*d^3*h^2*n)*B^2*log(b*x + a) + 2*(B^2*b^3*d^3*h^2*
x^3 + 3*B^2*b^3*d^3*g*h*x^2 + 3*B^2*b^3*d^3*g^2*x)*log((b*x + a)^n))*log((d
*x + c)^n))/(b^3*d^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(A^2h^2x^2 + 2\,A^2ghx + A^2g^2 + \left(B^2h^2x^2 + 2\,B^2ghx + B^2g^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\left(ABh^2x^2 + 2\,ABghx + ABg^2\right)\mathrm{lo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fric
```

```
as")
```

```
[Out] integral(A^2*h^2*x^2 + 2*A^2*g*h*x + A^2*g^2 + (B^2*h^2*x^2 + 2*B^2*g*h*x +
 B^2*g^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*(A*B*h^2*x^2 + 2*A*B*g*h*x +
 A*B*g^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac
")
```

```
[Out] Timed out
```

3.304 $\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx$

Optimal. Leaf size=294

$$\frac{B^2n^2(bc-ad)(-adh-bch+2bdg)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{b^2d^2}+\frac{Bn(bc-ad)(-adh-bch+2bdg)\log\left(\frac{bc-ad}{b(c+dx)}\right)(B\log(e(a+bx)^n}{b^2d^2}$$

```
[Out] (B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/(b^2*d^2) - (B*(b*c - a*d)*h*n*(a +
b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b^2*d) + (B*(b*c - a*d)*(2*
b*d*g - b*c*h - a*d*h)*n*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a +
b*x)^n)/(c + d*x)^n]))/(b^2*d^2) - ((b*g - a*h)^2*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])^2)/(2*b^2*h) + ((g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n])^2)/(2*h) + (B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog
[2, (d*(a + b*x))/(b*(c + d*x))])/(b^2*d^2)
```

Rubi [A] time = 0.955147, antiderivative size = 449, normalized size of antiderivative = 1.53, number of steps used = 20, number of rules used = 11, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.355, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$-\frac{B^2n^2(bg-ah)^2\text{PolyLog}\left(2,\frac{bc-ad}{d(a+bx)}+1\right)}{b^2h}-\frac{B^2n^2(dg-ch)^2\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{d^2h}-\frac{ABn(bg-ah)^2\log(a+bx)}{b^2h}+\frac{AB(g+}{}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] -((A*B*(b*c - a*d)*h*n*x)/(b*d)) + (A^2*(g + h*x)^2)/(2*h) - (A*B*(b*g - a*
h)^2*n*Log[a + b*x])/(b^2*h) + (A*B*(d*g - c*h)^2*n*Log[c + d*x])/(d^2*h) +
 (B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/(b^2*d^2) - (B^2*(b*c - a*d)*h*n*(a
 + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*d) + (A*B*(g + h*x)^2*Log[(e
*(a + b*x)^n)/(c + d*x)^n])/h + (B^2*(b*g - a*h)^2*n*Log[-((b*c - a*d)/(d*(
a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*h) - (B^2*(d*g - c*h)^2*
n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(d^2*h)
+ (B^2*(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h) - (B^2*(d*g -
c*h)^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^2*h) - (B^2*(b*g - a
*h)^2*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
```

```
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2(g+hx)+2AB(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+B^2(g+\right.$$

$$= \frac{A^2(g+hx)^2}{2h} + (2AB)\int (g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx + B^2$$

$$= \frac{A^2(g+hx)^2}{2h} + \frac{AB(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} + \frac{B^2(g+hx}{}$$

$$= \frac{A^2(g+hx)^2}{2h} + \frac{AB(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h} + \frac{B^2(g+hx}{}$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a+bx)}{b^2h} +$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a+bx)}{b^2h} +$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a+bx)}{b^2h} +$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a+bx)}{b^2h} +$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a+bx)}{b^2h} +$$

$$= -\frac{AB(bc-ad)hnx}{bd} + \frac{A^2(g+hx)^2}{2h} - \frac{AB(bg-ah)^2n\log(a+bx)}{b^2h} +$$

Mathematica [A] time = 0.985289, size = 472, normalized size = 1.61

$$\frac{2B^2n^2(bc-ad)(adh+bch-2bdg)\text{PolyLog}\left(2,\frac{d(a+bx)}{ad-bc}\right) - 2Bn\log(a+bx)\left(ad\left(A(adh-2bdg)+Bd(ah-2bg)\log\left(e(a+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (a*B^2*d^2*(-2*b*g + a*h)*n^2*Log[a + b*x]^2 - 2*B*n*Log[a + b*x]*(b^2*B*c*
(-2*d*g + c*h)*n*Log[c + d*x] - B*(b*c - a*d)*(-2*b*d*g + b*c*h + a*d*h)*n*
Log[(b*(c + d*x))/(b*c - a*d)] + a*d*(A*(-2*b*d*g + a*d*h) + B*(-2*b*d*g +
```

```
b*c*h - a*d*h)*n + B*d*(-2*b*g + a*h)*Log[(e*(a + b*x)^n)/(c + d*x)^n])) +
b*(b*B^2*c*(-2*d*g + c*h)*n^2*Log[c + d*x]^2 + 2*B*n*Log[c + d*x]*(A*b*c*(-
2*d*g + c*h) + B*(b*c^2*h - a*d*(2*d*g + c*h))*n + b*B*c*(-2*d*g + c*h)*Log
[(e*(a + b*x)^n)/(c + d*x)^n]) + d*(A*b*x*(2*A*d*g - 2*B*c*h*n + A*d*h*x) +
 2*a*B*n*(-2*A*d*g - 2*B*d*g*n + B*c*h*n + A*d*h*x) + 2*B*(a*B*d*n*(-2*g +
h*x) + b*x*(2*A*d*g - B*c*h*n + A*d*h*x))*Log[(e*(a + b*x)^n)/(c + d*x)^n]
+ b*B^2*d*x*(2*g + h*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)) + 2*B^2*(b*c -
 a*d)*(-2*b*d*g + b*c*h + a*d*h)*n^2*PolyLog[2, (d*(a + b*x))/(-(b*c) + a*d
)])/(2*b^2*d^2)
```

Maple [C] time = 2.088, size = 11007, normalized size = 37.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] result too large to display
```

Maxima [B] time = 3.61767, size = 1219, normalized size = 4.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxima
")
```

```
[Out] A*B*h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^2*h*x^2 + 2*A*B*g*x*log((b
*x + a)^n*e/(d*x + c)^n) + A^2*g*x + 2*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A*B*g/e - (a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/d^2 +
(b*c*e*n - a*d*e*n)*x/(b*d))*A*B*h/e - (a*c*d*h*n^2 + (2*c*d*g*n*log(e) - (
h*n^2 + h*n*log(e))*c^2)*b)*B^2*log(d*x + c)/(b*d^2) + (2*a*b*d^2*g*n^2 - a
^2*d^2*h*n^2 - (2*c*d*g*n^2 - c^2*h*n^2)*b^2)*(log(b*x + a)*log((b*d*x + a*
d)/(b*c - a*d) + 1) + dilog(-(b*d*x + a*d)/(b*c - a*d)))*B^2/(b^2*d^2) + 1/
2*(B^2*b^2*d^2*h*x^2*log(e)^2 + 2*(2*c*d*g*n^2 - c^2*h*n^2)*B^2*b^2*log(b*x
 + a)*log(d*x + c) - (2*c*d*g*n^2 - c^2*h*n^2)*B^2*b^2*log(d*x + c)^2 - (2*
a*b*d^2*g*n^2 - a^2*d^2*h*n^2)*B^2*log(b*x + a)^2 + 2*(a*b*d^2*h*n*log(e) -
```

```
(c*d*h*n*log(e) - d^2*g*log(e)^2)*b^2)*B^2*x + 2*((h*n^2 - h*n*log(e))*a^2
*d^2 - (c*d*h*n^2 - 2*d^2*g*n*log(e))*a*b)*B^2*log(b*x + a) + (B^2*b^2*d^2*
h*x^2 + 2*B^2*b^2*d^2*g*x)*log((b*x + a)^n)^2 + (B^2*b^2*d^2*h*x^2 + 2*B^2*
b^2*d^2*g*x)*log((d*x + c)^n)^2 + 2*(B^2*b^2*d^2*h*x^2*log(e) - (2*c*d*g*n
- c^2*h*n)*B^2*b^2*log(d*x + c) + (a*b*d^2*h*n - (c*d*h*n - 2*d^2*g*log(e))
*b^2)*B^2*x + (2*a*b*d^2*g*n - a^2*d^2*h*n)*B^2*log(b*x + a))*log((b*x + a)
^n) - 2*(B^2*b^2*d^2*h*x^2*log(e) - (2*c*d*g*n - c^2*h*n)*B^2*b^2*log(d*x +
 c) + (a*b*d^2*h*n - (c*d*h*n - 2*d^2*g*log(e))*b^2)*B^2*x + (2*a*b*d^2*g*n
 - a^2*d^2*h*n)*B^2*log(b*x + a) + (B^2*b^2*d^2*h*x^2 + 2*B^2*b^2*d^2*g*x)*
log((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^2hx + A^2g + \left(B^2hx + B^2g\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\left(ABhx + ABg\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fricas
")
```

```
[Out] integral(A^2*h*x + A^2*g + (B^2*h*x + B^2*g)*log((b*x + a)^n*e/(d*x + c)^n)
^2 + 2*(A*B*h*x + A*B*g)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (hx+g)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

3.305 $\int (A + B\log(e(a+bx)^n(c+dx)^{-n}))^2\,dx$

Optimal. Leaf size=137

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{2Bn(bc-ad)\log\left(\frac{bc-ad}{b(c+dx)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{bd}+\frac{(a+bx)(B\log(e$$

```
[Out] (2*B*(b*c - a*d)*n*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n]))/(b*d) + ((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]
)^2)/b + (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b
*d)
```

Rubi [A] time = 0.320797, antiderivative size = 195, normalized size of antiderivative = 1.42, number of steps used = 10, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {6742, 2486, 31, 2488, 2411, 2343, 2333, 2315}

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)}{bd}+\frac{2AB(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{b}-\frac{2ABn(bc-ad)\log(c+dx)}{bd}+\frac{B^2(a+b$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] A^2*x - (2*A*B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (2*A*B*(a + b*x)*Log[(e*
(a + b*x)^n)/(c + d*x)^n])/b + (2*B^2*(b*c - a*d)*n*Log[(b*c - a*d)/(b*(c +
 d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (B^2*(a + b*x)*Log[(e*(a
+ b*x)^n)/(c + d*x)^n]^2)/b + (2*B^2*(b*c - a*d)*n^2*PolyLog[2, (d*(a + b*x
))/(b*(c + d*x))])/(b*d)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
```

```
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^2\,dx = \int \left(A^2+2AB\log\left(e(a+bx)^n(c+dx)^{-n}\right)+B^2\log^2\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\,d$$

$$= A^2x+(2AB)\int \log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx+B^2\int \log^2\left(e(a+bx)^n(c+$$

$$= A^2x+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{b}+\frac{B^2(a+bx)\log^2\left(e(a+bx)\right.}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.}{b}$$

$$= A^2x-\frac{2AB(bc-ad)n\log(c+dx)}{bd}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right.}{b}$$

Mathematica [A] time = 0.147173, size = 217, normalized size = 1.58

$$B^2n(bc-ad)\left(2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)-\log\left(\frac{bc-ad}{bc+bdx}\right)\left(-2\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2n\log\left(\frac{d(a+bx)}{ad-bc}\right)+n\log\left(\frac{bc-ad}{bc+bdx}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2,x]
```

```
[Out] (A^2*b*d*x - 2*A*B*(b*c - a*d)*n*Log[c + d*x] + 2*A*B*d*(a + b*x)*Log[(e*(a
 + b*x)^n)/(c + d*x)^n] + B^2*d*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
2 + B^2*(b*c - a*d)*n*(-(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*n*Log[(d*(a + b*
x))/(-(b*c) + a*d)] - 2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + n*Log[(b*c - a*d
)/(b*c + b*d*x)])) + 2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]))/(b*d)
```

Maple [C] time = 1.311, size = 4749, normalized size = 34.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2,x)
```

```
[Out] A^2*x-2/d*n*B^2*ln((b*x+a)^n)*c*ln(d*x+c)-I*x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(
b*x+a)^n/((d*x+c)^n))^3-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^6+ln(e
)^2*x*B^2+2/b*A*B*ln(b*x+a)*a*n-1/4*B^2*Pi^2*x*csgn(I/((d*x+c)^n))^2*csgn(I
*(b*x+a)^n/((d*x+c)^n))^4+1/2*B^2*Pi^2*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)
^n/((d*x+c)^n))^5+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^4*csgn(I*e/(
(d*x+c)^n)*(b*x+a)^n)^2-1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^4+B^2*x*ln((d*x+c)^n)^2-I*x*ln((b*x+a)^n)
*B^2*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn
(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^4-1/2*B^2*Pi^2*x*csgn(I*(b*x+
a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2
*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*
x+c)^n)*(b*x+a)^n)^3-1/2*B^2*Pi^2*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((
d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+B^2*x*ln((b*x+a)^n)^2-n^2*B^
2*c/d*ln(d*x+c)^2-1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)
^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*B^2*Pi^2*x*csgn(I*e
)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*
(b*x+a)^n)+I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*c
sgn(I*(b*x+a)^n/((d*x+c)^n))-I*A*B*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n
))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)*x-I*A*B*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*
x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*x-I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*(b
*x+a)^n/((d*x+c)^n))^3+2*ln(e)*x*B*A+I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I/((d*x+
c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*e)*c
sgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*(b*x+a)^n)
*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-2*B*c*n/d*ln(d*x+c)*A+2/b*B^2*a*n^2*ln(b*x
+a)*ln((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))-I*B^2*ln(e)*Pi*csgn(I*e)*csgn(I*(b*
x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)*x-I*B^2*ln(e)*Pi*csgn(I
*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*x+2*B*x*ln((b
*x+a)^n)*A+B^2*a/b*ln((b*x+a)^n)^2+2*x*ln((b*x+a)^n)*B^2*ln(e)+(-2*B^2*x*ln
((b*x+a)^n)-B*(-I*B*Pi*b*d*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I
*e/((d*x+c)^n)*(b*x+a)^n)+I*B*Pi*b*d*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+
a)^n)^2-I*B*Pi*b*d*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n
/((d*x+c)^n))+I*B*Pi*b*d*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^
2+I*B*Pi*b*d*x*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B*Pi*b
*d*x*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B*Pi*b*d*x*csgn(I*(b*x+a)^n/((d*x+c)
^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B*Pi*b*d*x*csgn(I*e/((d*x+c)^n)*(b
```

*x+a)^n)^3+2*B*ln(e)*b*d*x+2*B*a*d*n*ln(b*x+a)-2*B*ln(d*x+c)*b*c*n+2*A*b*d*
x)/b/d)*ln((d*x+c)^n)-1/4*B^2*Pi^2*x*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^6-2*B^
2/b*a*n*ln((b*x+a)^n)+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^5-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n)^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^4+1/
2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^5-I*A*B*Pi*csg
n(I*e/((d*x+c)^n)*(b*x+a)^n)^3*x+I*B^2*ln(e)*Pi*csgn(I*e)*csgn(I*e/((d*x+c)
^n)*(b*x+a)^n)^2*x+I*B^2*ln(e)*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+
c)^n))^2*x+I*B^2*ln(e)*Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))
^2*x-2*n^2*B^2*c/d+I*B^2*ln(e)*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((
d*x+c)^n)*(b*x+a)^n)^2*x+2/b*B^2*ln(b*x+a)*ln(e)*a*n-2*B^2*c*n/d*ln(d*x+c)*
ln(e)+2*n^2*B^2*c/d*dilog((b*(d*x+c)+a*d-b*c)/(a*d-b*c))+2*n^2*B^2/b*a*ln(b
*(d*x+c)+a*d-b*c)-I*x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c
)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))+I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*e)*csgn
(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*(b*x+a)^n)*cs
gn(I*(b*x+a)^n/((d*x+c)^n))^2+I/b*B^2*ln(b*x+a)*Pi*a*n*csgn(I*(b*x+a)^n/((d
*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I
/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2-I*B^2*c*n/d*ln(d*x+c)*Pi*csgn
(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+2/b*B^2*a*n^2*d
ilog((-a*d+b*c+d*(b*x+a))/(-a*d+b*c))+2*B^2*a*n^2/b+1/2*B^2*Pi^2*x*csgn(I*e
)*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*B^2
*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x
+a)^n)^3-B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^4-1/4*B^2*Pi^2*x*csgn(I*(b*x+a)^n)^2*csgn(I/((d*x+c)^n))^2
csgn(I(b*x+a)^n/((d*x+c)^n))^2+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)^2*csgn(I/
((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^
n)*csgn(I/((d*x+c)^n))^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^3-I*B^2*ln(e)*Pi*csg
n(I*(b*x+a)^n/((d*x+c)^n))^3*x-I*B^2*ln(e)*Pi*csgn(I*e/((d*x+c)^n)*(b*x+a)^
n)^3*x-I*A*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3*x+I*x*ln((b*x+a)^n)*B^2*Pi*
csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+I*x*ln((b*x+a)^n)*B^2*Pi*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2+1/2*B^2*Pi^2*x*csgn(I*(
b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^5-1/4*B^2*Pi^2*x*csgn
(I*e)^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^4+I*x*ln((b*x+a)^n)*B^2*Pi*csgn(I*(
b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+I*x*ln((b*x+a)^n)*B
^2*Pi*csgn(I*e)*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2*B^2*Pi^2*x*csgn(I/((d
*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3
-1/4*B^2*Pi^2*x*csgn(I*e)^2*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^2+1/2*B^2*Pi^2*x*csgn(I*e)^2*csgn(I*(b*x+a)^n/((d*x+c)^n))
*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^
n/((d*x+c)^n))^4*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I/b*B^2*ln(b*x+a)*Pi*a*n*c
sgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-I/b*
B^2*ln(b*x+a)*Pi*a*n*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n
/((d*x+c)^n))+I*B^2*c*n/d*ln(d*x+c)*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^
n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)-1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I/((d*x+c
)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2+1/2
*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)

```
^n))^2*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-1/2*B^2*Pi^2*x*csgn(I*(b*x+a)^n)*c
sgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+
a)^n)^3+2*n^2*B^2*c/d*ln(d*x+c)*ln((b*(d*x+c)+a*d-b*c)/(a*d-b*c))+I*B^2*c*n
/d*ln(d*x+c)*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))^3+I*B^2*c*n/d*ln(d*x+c)*Pi*cs
gn(I*e/((d*x+c)^n)*(b*x+a)^n)^3-1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n)*
csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*csgn(I*e/((d*x+c)^n)*(b
*x+a)^n)+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n)*csgn(I/((d*x+c)^n))*csg
n(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^2-I*x*ln((b*x+a)
^n)*B^2*Pi*csgn(I*e)*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*
x+a)^n)+I*A*B*Pi*csgn(I*(b*x+a)^n/((d*x+c)^n))*csgn(I*e/((d*x+c)^n)*(b*x+a)
^n)^2*x+I*A*B*Pi*csgn(I*(b*x+a)^n)*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*x+I*A*B*
Pi*csgn(I/((d*x+c)^n))*csgn(I*(b*x+a)^n/((d*x+c)^n))^2*x-I/b*B^2*ln(b*x+a)*
Pi*a*n*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)^3+I*A*B*Pi*csgn(I*e)*csgn(I*e/((d*x+
c)^n)*(b*x+a)^n)^2*x+1/2*B^2*Pi^2*x*csgn(I*e)*csgn(I*(b*x+a)^n)*csgn(I*(b*x
+a)^n/((d*x+c)^n))^3*csgn(I*e/((d*x+c)^n)*(b*x+a)^n)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,ABx\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2x+B^2\left(\frac{2\,bcn^2\log(bx+a)\log(dx+c)-bcn^2\log(dx+c)^2+bdx\log\left((bx+a)^n\right)^2+bdx\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="maxima")
```

```
[Out] 2*A*B*x*log((b*x + a)^n*e/(d*x + c)^n) + A^2*x + B^2*((2*b*c*n^2*log(b*x +
a)*log(d*x + c) - b*c*n^2*log(d*x + c)^2 + b*d*x*log((b*x + a)^n)^2 + b*d*x
*log((d*x + c)^n)^2 + 2*(a*d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x*lo
g(e))*log((b*x + a)^n) - 2*(a*d*n*log(b*x + a) - b*c*n*log(d*x + c) + b*d*x
*log((b*x + a)^n) + b*d*x*log(e))*log((d*x + c)^n))/(b*d) - integrate(-(b^2
*d*x^2*log(e)^2 + a*b*c*log(e)^2 - ((2*n*log(e) - log(e)^2)*b^2*c - (2*n*lo
g(e) + log(e)^2)*a*b*d)*x - 2*(b^2*c*n^2*x + 2*a*b*c*n^2 - a^2*d*n^2)*log(b
*x + a))/(b^2*d*x^2 + a*b*c + (b^2*c + a*b*d)*x), x)) + 2*(a*e*n*log(b*x +
a)/b - c*e*n*log(d*x + c)/d)*A*B/e
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="fricas")
```

```
[Out] integral(B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d*
x + c)^n) + A^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2, x)
```

3.306 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{g+hx}\,dx$

Optimal. Leaf size=301

$$\frac{2Bn\text{PolyLog}\left(2,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{h}-\frac{2Bn\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right.}{h}$$

```
[Out] -((Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^
2)/h) + ((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - ((d*g - c*h)*(a
 + b*x))/((b*g - a*h)*(c + d*x))])/h - (2*B*n*(A + B*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/h + (2*B*n*(A + B*Log[
(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[2, ((d*g - c*h)*(a + b*x))/((b*g - a*
h)*(c + d*x))])/h + (2*B^2*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/h -
 (2*B^2*n^2*PolyLog[3, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))])/h
```

Rubi [A] time = 0.815256, antiderivative size = 473, normalized size of antiderivative = 1.57, number of steps used = 16, number of rules used = 10, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {6742, 2494, 2394, 2393, 2391, 2489, 2488, 2506, 6610, 2503}

$$-\frac{2ABn\text{PolyLog}\left(2,\frac{b(g+hx)}{bg-ah}\right)}{h}+\frac{2B^2n\log\left(e(a+bx)^n(c+dx)^{-n}\right)\text{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{h}-\frac{2B^2n\text{PolyLog}\left(2,1-\frac{bc-}{b(c-}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x),x]
```

```
[Out] -((B^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/h
) + (A^2*Log[g + h*x])/h - (2*A*B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g
 + h*x])/h + (2*A*B*n*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/h + (
2*A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/h + (B^2*Log[(e*(a + b
*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])
/h - (2*A*B*n*PolyLog[2, (b*(g + h*x))/(b*g - a*h)])/h + (2*A*B*n*PolyLog[2
, (d*(g + h*x))/(d*g - c*h)])/h - (2*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]
*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/h + (2*B^2*n*Log[(e*(a + b*x)^n
)/(c + d*x)^n]*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x
))])/h + (2*B^2*n^2*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/h - (2*B^2*n
^2*PolyLog[3, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2489

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r]^s/(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[Log[e
*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a
, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0
] && NeQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
```

```
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^2}{g+hx}\,dx = \int\left(\frac{A^2}{g+hx} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{g+hx} + \frac{B^2\log^2(e(a+bx)^n(c+dx)\right.$$

$$= \frac{A^2\log(g+hx)}{h} + (2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{g+hx}\,dx + B^2\int\frac{\log^2(e(a}{}$$

$$= \frac{A^2\log(g+hx)}{h} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})\log(g+hx)}{h} + \frac{(B^2d)\int \log}{}$$

$$= -\frac{B^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} + \frac{A^2\log(g+hx)}{h} - \frac{2ABn\log}{}$$

$$= -\frac{B^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} + \frac{A^2\log(g+hx)}{h} - \frac{2ABn\log}{}$$

$$= -\frac{B^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} + \frac{A^2\log(g+hx)}{h} - \frac{2ABn\log}{}$$

Mathematica [B] time = 0.462649, size = 1082, normalized size = 3.59

$$\frac{-2n\left(-n\log(a+bx) + n\log(c+dx) + \log(e(a+bx)^n(c+dx)^{-n})\right)\left(\log(c+dx)\log\left(\frac{d(g+hx)}{dg-ch}\right) + \text{PolyLog}\left(2, \frac{h(c+dx)}{ch-dg}\right)\right)B^2}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x),x]
```

```
[Out] ((A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)
^n]))^2*Log[g + h*x] + 2*B*n*(A + B*(-(n*Log[a + b*x]) + n*Log[c + d*x] + L
og[(e*(a + b*x)^n)/(c + d*x)^n]))*(Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*
h)] + PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)]) - 2*A*B*n*(Log[c + d*x]*Log
[(d*(g + h*x))/(d*g - c*h)] + PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)]) - 2
*B^2*n*(-(n*Log[a + b*x]) + n*Log[c + d*x] + Log[(e*(a + b*x)^n)/(c + d*x)^
n])*(Log[c + d*x]*Log[(d*(g + h*x))/(d*g - c*h)] + PolyLog[2, (h*(c + d*x))
/(-(d*g) + c*h)]) + B^2*n^2*(Log[a + b*x]^2*Log[(b*(g + h*x))/(b*g - a*h)]
+ 2*Log[a + b*x]*PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)] - 2*PolyLog[3, (h
*(a + b*x))/(-(b*g) + a*h)]) + B^2*n^2*(Log[c + d*x]^2*Log[(d*(g + h*x))/(d
*g - c*h)] + 2*Log[c + d*x]*PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)] - 2*Po
lyLog[3, (h*(c + d*x))/(-(d*g) + c*h)]) - 2*B^2*n^2*(Log[a + b*x]*Log[c + d
*x]*Log[(b*(g + h*x))/(b*g - a*h)] + (Log[(h*(c + d*x))/(-(d*g) + c*h)]*(-2
*Log[a + b*x] + Log[(h*(c + d*x))/(-(d*g) + c*h)])*(Log[(b*(g + h*x))/(b*g
```

```
- a*h)] - Log[(d*(g + h*x))/(d*g - c*h)]))/2 + Log[(h*(c + d*x))/(-(d*g) +
c*h)]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*(-Log[(b*(g + h*
x))/(b*g - a*h)] + Log[(d*(g + h*x))/(d*g - c*h)]) + (Log[((b*g - a*h)*(c +
 d*x))/((d*g - c*h)*(a + b*x))]^2*(Log[(-(b*c) + a*d)/(d*(a + b*x))] + Log[
(b*(g + h*x))/(b*g - a*h)] - Log[((-(b*c) + a*d)*(g + h*x))/((d*g - c*h)*(a
 + b*x))]))/2 + (Log[c + d*x] - Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a
 + b*x))])*PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)] + (Log[a + b*x] + Log[(
(b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))])*PolyLog[2, (h*(c + d*x))/(
-(d*g) + c*h)] + Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*(Poly
Log[2, (b*(c + d*x))/(d*(a + b*x))] - PolyLog[2, ((b*g - a*h)*(c + d*x))/((
d*g - c*h)*(a + b*x))]) - PolyLog[3, (h*(a + b*x))/(-(b*g) + a*h)] - PolyLo
g[3, (h*(c + d*x))/(-(d*g) + c*h)] - PolyLog[3, (b*(c + d*x))/(d*(a + b*x))
] + PolyLog[3, ((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]))/h
```

Maple [F] time = 2.559, size = 0, normalized size = 0.

$$\int \frac{1}{hx+g}\left(A+B\ln\left(\frac{e\,(bx+a)^{n}}{(dx+c)^{n}}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{A^{2}\log\left(hx+g\right)}{h}+\int\frac{B^{2}\log\left((bx+a)^{n}\right)^{2}+B^{2}\log\left((dx+c)^{n}\right)^{2}+B^{2}\log\left(e\right)^{2}+2\,AB\log\left(e\right)+2\left(B^{2}\log\left(e\right)+AB\right)\log\left((bx\right.}{hx+g}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x, algorithm="maxima
")
```

```
[Out] A^2*log(h*x + g)/h + integrate((B^2*log((b*x + a)^n)^2 + B^2*log((d*x + c)^
n)^2 + B^2*log(e)^2 + 2*A*B*log(e) + 2*(B^2*log(e) + A*B)*log((b*x + a)^n)
- 2*(B^2*log((b*x + a)^n) + B^2*log(e) + A*B)*log((d*x + c)^n))/(h*x + g),
```

```
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2}{hx+g},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x, algorithm="fricas
")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(h*x + g), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(h*x + g), x)
```

3.307 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(g+hx)^2}\,dx$

Optimal. Leaf size=208

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}+\frac{2Bn(bc-ad)\log\left(1-\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A)}{(bg-ah)(dg-ch)}+\frac{(a+}{}$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/((b*g - a*h)*(g + h*
x)) + (2*B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - (
(d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h))
+ (2*B^2*(b*c - a*d)*n^2*PolyLog[2, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c
 + d*x))])/((b*g - a*h)*(d*g - c*h))
```

Rubi [A] time = 0.406977, antiderivative size = 343, normalized size of antiderivative = 1.65, number of steps used = 10, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212, Rules used = {6742, 2490, 36, 31, 2503, 2502, 2315}

$$\frac{2B^2n^2(bc-ad)\text{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}+\frac{2AB(a+bx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{(g+hx)(bg-ah)}-\frac{2ABn(bc-ad)\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^2,x]
```

```
[Out] -(A^2/(h*(g + h*x))) - (2*A*B*(b*c - a*d)*n*Log[c + d*x])/((b*g - a*h)*(d*g
 - c*h)) + (2*A*B*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a*h)*
(g + h*x)) + (B^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b*g - a*h
)*(g + h*x)) + (2*A*B*(b*c - a*d)*n*Log[g + h*x])/((b*g - a*h)*(d*g - c*h))
 + (2*B^2*(b*c - a*d)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[((b*c - a*d)*(
g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h)) + (2*B^2*(b*c
 - a*d)*n^2*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))]
)/((b*g - a*h)*(d*g - c*h))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(g+hx)^2}\,dx = \int\left(\frac{A^2}{(g+hx)^2}+\frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2}+\frac{B^2\log^2(e(a+bx)^n(c+dx\right.$$

$$= -\frac{A^2}{h(g+hx)}+(2AB)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2}\,dx+B^2\int\frac{\log^2(e(a+bx)}{(g+h}$$

$$= -\frac{A^2}{h(g+hx)}+\frac{2AB(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{(bg-ah)(g+hx)}+\frac{B^2(a+bx)\log^2(e(a}{(bg-ah)(}$$

$$= -\frac{A^2}{h(g+hx)}+\frac{2AB(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{(bg-ah)(g+hx)}+\frac{B^2(a+bx)\log^2(e(a}{(bg-ah)(}$$

$$= -\frac{A^2}{h(g+hx)}-\frac{2AB(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{2AB(a+bx)\log(e(a+bx)^n(c+}{(bg-ah)(g+hx)}$$

$$= -\frac{A^2}{h(g+hx)}-\frac{2AB(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)}+\frac{2AB(a+bx)\log(e(a+bx)^n(c+}{(bg-ah)(g+hx)}$$

Mathematica [B] time = 2.28281, size = 3460, normalized size = 16.63

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^2,x]
```

```
[Out] (-(A^2*b*d*g^2) + A^2*b*c*g*h + a*A^2*d*g*h - a*A^2*c*h^2 + 2*A*b*B*d*g^2*n
*Log[a + b*x] - 2*A*b*B*c*g*h*n*Log[a + b*x] + 2*A*b*B*d*g*h*n*x*Log[a + b*
x] - 2*A*b*B*c*h^2*n*x*Log[a + b*x] - b*B^2*d*g^2*n^2*Log[a + b*x]^2 + b*B^
2*c*g*h*n^2*Log[a + b*x]^2 - b*B^2*d*g*h*n^2*x*Log[a + b*x]^2 + b*B^2*c*h^2
*n^2*x*Log[a + b*x]^2 - 2*A*b*B*d*g^2*n*Log[c + d*x] + 2*a*A*B*d*g*h*n*Log[
c + d*x] - 2*A*b*B*d*g*h*n*x*Log[c + d*x] + 2*a*A*B*d*h^2*n*x*Log[c + d*x]
+ 2*b*B^2*d*g^2*n^2*Log[a + b*x]*Log[c + d*x] - 2*a*B^2*d*g*h*n^2*Log[a + b
*x]*Log[c + d*x] + 2*b*B^2*d*g*h*n^2*x*Log[a + b*x]*Log[c + d*x] - 2*a*B^2*
d*h^2*n^2*x*Log[a + b*x]*Log[c + d*x] - b*B^2*d*g^2*n^2*Log[c + d*x]^2 + a*
B^2*d*g*h*n^2*Log[c + d*x]^2 - b*B^2*d*g*h*n^2*x*Log[c + d*x]^2 + a*B^2*d*h
^2*n^2*x*Log[c + d*x]^2 - 2*b*B^2*c*g*h*n^2*Log[a + b*x]*Log[(h*(c + d*x))/
(-(d*g) + c*h)] + 2*a*B^2*d*g*h*n^2*Log[a + b*x]*Log[(h*(c + d*x))/(-(d*g)
```

+ c*h)] - 2*b*B^2*c*h^2*n^2*x*Log[a + b*x]*Log[(h*(c + d*x))/(-(d*g) + c*h)
] + 2*a*B^2*d*h^2*n^2*x*Log[a + b*x]*Log[(h*(c + d*x))/(-(d*g) + c*h)] + b*
B^2*c*g*h*n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]^2 - a*B^2*d*g*h*n^2*Log[(h*
(c + d*x))/(-(d*g) + c*h)]^2 + b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g)
+ c*h)]^2 - a*B^2*d*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]^2 - 2*b*B^2
*c*g*h*n^2*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[((b*g - a*h)*(c + d*x))/((
d*g - c*h)*(a + b*x))] + 2*a*B^2*d*g*h*n^2*Log[(-(b*c) + a*d)/(d*(a + b*x))
]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))] - 2*b*B^2*c*h^2*n^2*
x*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h
)*(a + b*x))] + 2*a*B^2*d*h^2*n^2*x*Log[(-(b*c) + a*d)/(d*(a + b*x))]*Log[(
(b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))] - 2*b*B^2*c*g*h*n^2*Log[(h*
(c + d*x))/(-(d*g) + c*h)]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*
x))] + 2*a*B^2*d*g*h*n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[((b*g - a*h)
*(c + d*x))/((d*g - c*h)*(a + b*x))] - 2*b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x)
)/(-(d*g) + c*h)]*Log[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))] + 2*
a*B^2*d*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[((b*g - a*h)*(c + d
*x))/((d*g - c*h)*(a + b*x))] + b*B^2*c*g*h*n^2*Log[((b*g - a*h)*(c + d*x))
/((d*g - c*h)*(a + b*x))]^2 - a*B^2*d*g*h*n^2*Log[((b*g - a*h)*(c + d*x))/(
(d*g - c*h)*(a + b*x))]^2 + b*B^2*c*h^2*n^2*x*Log[((b*g - a*h)*(c + d*x))/(
(d*g - c*h)*(a + b*x))]^2 - a*B^2*d*h^2*n^2*x*Log[((b*g - a*h)*(c + d*x))/(
(d*g - c*h)*(a + b*x))]^2 - 2*A*b*B*d*g^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]
+ 2*A*b*B*c*g*h*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*a*A*B*d*g*h*Log[(e*(a
+ b*x)^n)/(c + d*x)^n] - 2*a*A*B*c*h^2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2
*b*B^2*d*g^2*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b*B^2*c*g*
h*n*Log[a + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] + 2*b*B^2*d*g*h*n*x*Log[a
 + b*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b*B^2*c*h^2*n*x*Log[a + b*x]*L
og[(e*(a + b*x)^n)/(c + d*x)^n] - 2*b*B^2*d*g^2*n*Log[c + d*x]*Log[(e*(a +
b*x)^n)/(c + d*x)^n] + 2*a*B^2*d*g*h*n*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c
+ d*x)^n] - 2*b*B^2*d*g*h*n*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n]
 + 2*a*B^2*d*h^2*n*x*Log[c + d*x]*Log[(e*(a + b*x)^n)/(c + d*x)^n] - b*B^2*
d*g^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 + b*B^2*c*g*h*Log[(e*(a + b*x)^n)/
(c + d*x)^n]^2 + a*B^2*d*g*h*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - a*B^2*c*h
^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2 - 2*A*b*B*d*g^2*n*Log[(b*(g + h*x))/(
b*g - a*h)] + 2*A*b*B*c*g*h*n*Log[(b*(g + h*x))/(b*g - a*h)] - 2*A*b*B*d*g*
h*n*x*Log[(b*(g + h*x))/(b*g - a*h)] + 2*A*b*B*c*h^2*n*x*Log[(b*(g + h*x))/
(b*g - a*h)] + 2*b*B^2*d*g^2*n^2*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)
] - 2*a*B^2*d*g*h*n^2*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*b*B^2
*d*g*h*n^2*x*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] - 2*a*B^2*d*h^2*n^
2*x*Log[a + b*x]*Log[(b*(g + h*x))/(b*g - a*h)] - 2*b*B^2*d*g^2*n^2*Log[(h*
(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*b*B^2*c*g*h*n
^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*x))/(b*g - a*h)] - 2*b*B
^2*d*g*h*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*x))/(b*g - a
*h)] + 2*b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(b*(g + h*
x))/(b*g - a*h)] - 2*b*B^2*d*g^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[(b*
(g + h*x))/(b*g - a*h)] + 2*b*B^2*c*g*h*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*

```
Log[(b*(g + h*x))/(b*g - a*h)] - 2*b*B^2*d*g*h*n*x*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*b*B^2*c*h^2*n*x*Log[(e*(a + b*x
)^n)/(c + d*x)^n]*Log[(b*(g + h*x))/(b*g - a*h)] + 2*A*b*B*d*g^2*n*Log[(d*(
g + h*x))/(d*g - c*h)] - 2*a*A*B*d*g*h*n*Log[(d*(g + h*x))/(d*g - c*h)] + 2
*A*b*B*d*g*h*n*x*Log[(d*(g + h*x))/(d*g - c*h)] - 2*a*A*B*d*h^2*n*x*Log[(d*
(g + h*x))/(d*g - c*h)] - 2*b*B^2*d*g^2*n^2*Log[a + b*x]*Log[(d*(g + h*x))/
(d*g - c*h)] + 2*a*B^2*d*g*h*n^2*Log[a + b*x]*Log[(d*(g + h*x))/(d*g - c*h)
] - 2*b*B^2*d*g*h*n^2*x*Log[a + b*x]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*a*B
^2*d*h^2*n^2*x*Log[a + b*x]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*b*B^2*d*g^2*
n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(d*(g + h*x))/(d*g - c*h)] - 2*b*
B^2*c*g*h*n^2*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(d*(g + h*x))/(d*g - c*
h)] + 2*b*B^2*d*g*h*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log[(d*(g + h*x
))/(d*g - c*h)] - 2*b*B^2*c*h^2*n^2*x*Log[(h*(c + d*x))/(-(d*g) + c*h)]*Log
[(d*(g + h*x))/(d*g - c*h)] + 2*b*B^2*d*g^2*n*Log[(e*(a + b*x)^n)/(c + d*x)
^n]*Log[(d*(g + h*x))/(d*g - c*h)] - 2*a*B^2*d*g*h*n*Log[(e*(a + b*x)^n)/(c
 + d*x)^n]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*b*B^2*d*g*h*n*x*Log[(e*(a + b
*x)^n)/(c + d*x)^n]*Log[(d*(g + h*x))/(d*g - c*h)] - 2*a*B^2*d*h^2*n*x*Log[
(e*(a + b*x)^n)/(c + d*x)^n]*Log[(d*(g + h*x))/(d*g - c*h)] + 2*B^2*(b*c -
a*d)*h*n^2*(g + h*x)*PolyLog[2, (h*(a + b*x))/(-(b*g) + a*h)] - 2*B^2*(b*c
- a*d)*h*n^2*(g + h*x)*PolyLog[2, (h*(c + d*x))/(-(d*g) + c*h)] - 2*b*B^2*c
*g*h*n^2*PolyLog[2, (b*(c + d*x))/(d*(a + b*x))] + 2*a*B^2*d*g*h*n^2*PolyLo
g[2, (b*(c + d*x))/(d*(a + b*x))] - 2*b*B^2*c*h^2*n^2*x*PolyLog[2, (b*(c +
d*x))/(d*(a + b*x))] + 2*a*B^2*d*h^2*n^2*x*PolyLog[2, (b*(c + d*x))/(d*(a +
 b*x))])/(h*(-(b*g) + a*h)*(-(d*g) + c*h)*(g + h*x))
```

Maple [F] time = 2.712, size = 0, normalized size = 0.

$$\int \frac{1}{\left(hx+g\right)^{2}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-B^2\left(\frac{\log\left((dx+c)^n\right)^2}{h^2x+gh}+\int-\frac{dhx\log(e)^2+ch\log(e)^2+(dhx+ch)\log\left((bx+a)^n\right)^2+2\,(dhx\log(e)+ch\log(e))\log\left((bx\right.}{dh^3x^3+cg^2h+\left(2\,dgh^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x, algorithm="maxi
ma")
```

```
[Out] -B^2*(log((d*x + c)^n)^2/(h^2*x + g*h) + integrate(-(d*h*x*log(e)^2 + c*h*l
og(e)^2 + (d*h*x + c*h)*log((b*x + a)^n)^2 + 2*(d*h*x*log(e) + c*h*log(e))*
log((b*x + a)^n) + 2*(d*g*n + (h*n - h*log(e))*d*x - c*h*log(e) - (d*h*x +
c*h)*log((b*x + a)^n))*log((d*x + c)^n))/(d*h^3*x^3 + c*g^2*h + (2*d*g*h^2
+ c*h^3)*x^2 + (d*g^2*h + 2*c*g*h^2)*x), x)) + 2*(b*e*n*log(b*x + a)/(b*g*h
 - a*h^2) - d*e*n*log(d*x + c)/(d*g*h - c*h^2) - (b*c*e*n - a*d*e*n)*log(h*
x + g)/((d*g*h - c*h^2)*a - (d*g^2 - c*g*h)*b))*A*B/e - 2*A*B*log((b*x + a)
^n*e/(d*x + c)^n)/(h^2*x + g*h) - A^2/(h^2*x + g*h)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^2}{h^2x^2+2\,ghx+g^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(h^2*x^2 + 2*g*h*x + g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(h*x+g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^2}{(hx+g)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^2/(h*x + g)^2, x)
```

3.308 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(g+hx)^3}\,dx$

Optimal. Leaf size=393

$$\frac{B^2n^2(bc-ad)(-adh-bch+2bdg)\text{PolyLog}\left(2,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)}{(bg-ah)^2(dg-ch)^2}+\frac{b^2\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)^2}{2h(bg-ah)^2}+\frac{Bhn(a+bx)(bc}{(}$$

```
[Out] (B*(b*c - a*d)*h*n*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/((b*
g - a*h)^2*(d*g - c*h)*(g + h*x)) + (b^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*
x)^n])^2)/(2*h*(b*g - a*h)^2) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/
(2*h*(g + h*x)^2) + (B^2*(b*c - a*d)^2*h*n^2*Log[(g + h*x)/(c + d*x)])/((b*
g - a*h)^2*(d*g - c*h)^2) + (B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*(A +
 B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - ((d*g - c*h)*(a + b*x))/((b*g
- a*h)*(c + d*x))]])/((b*g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d
*g - b*c*h - a*d*h)*n^2*PolyLog[2, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c
+ d*x))]])/((b*g - a*h)^2*(d*g - c*h)^2)
```

Rubi [B] time = 1.63057, antiderivative size = 968, normalized size of antiderivative = 2.46, number of steps used = 29, number of rules used = 16, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.485, Rules used = {6742, 2492, 72, 2514, 2488, 2411, 2343, 2333, 2315, 2490, 36, 31, 2494, 2394, 2393, 2391}

$$-\frac{A^2}{2h(g+hx)^2}+\frac{b^2Bn\log(a+bx)A}{h(bg-ah)^2}-\frac{Bd^2n\log(c+dx)A}{h(dg-ch)^2}-\frac{B\log\left(e(a+bx)^n(c+dx)^{-n}\right)A}{h(g+hx)^2}+\frac{B(bc-ad)(2bdg-bch-a}{(bg-ah)^2(dg}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^3,x]
```

```
[Out] -A^2/(2*h*(g + h*x)^2) - (A*B*(b*c - a*d)*n)/((b*g - a*h)*(d*g - c*h)*(g +
h*x)) + (A*b^2*B*n*Log[a + b*x])/(h*(b*g - a*h)^2) - (A*B*d^2*n*Log[c + d*x
])/(h*(d*g - c*h)^2) - (B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/((b*g - a*h)^
2*(d*g - c*h)^2) - (A*B*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(g + h*x)^2) +
 (B^2*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a
*h)^2*(d*g - c*h)*(g + h*x)) - (b^2*B^2*n*Log[-((b*c - a*d)/(d*(a + b*x)))]
*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(b*g - a*h)^2) + (B^2*d^2*n*Log[(b*c
- a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(d*g - c*h)^2) -
 (B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h*(g + h*x)^2) + (A*B*(b*c - a
*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2)
 + (B^2*(b*c - a*d)^2*h*n^2*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) - (
```

```
B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[-((h*(a + b*x))/(b*g - a*
h))]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d*
g - b*c*h - a*d*h)*n^2*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/((b*
g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2)
+ (B^2*d^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(h*(d*g - c*h)^2) -
 (B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog[2, (b*(g + h*x))/(b
*g - a*h)])/((b*g - a*h)^2*(d*g - c*h)^2) + (B^2*(b*c - a*d)*(2*b*d*g - b*c
*h - a*d*h)*n^2*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/((b*g - a*h)^2*(d*g
- c*h)^2) + (b^2*B^2*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(h*(b*g
 - a*h)^2)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
```

(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p *(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ [b*g - a*h, 0] && IGtQ[s, 0]

Rule 2411

Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]

Rule 2343

Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x], x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]

Rule 2333

Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]

Rule 2315

Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]

Rule 2490

Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0]

Rule 36

Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],

```
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^2}{(g+hx)^3}\,dx = \int \left(\frac{A^2}{(g+hx)^3} + \frac{2AB\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^3} + \frac{B^2\log^2(e(a+bx)^n(c+d}{(g+hx)^3}\right.$$

$$= -\frac{A^2}{2h(g+hx)^2} + (2AB)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^3}\,dx + B^2\int \frac{\log^2(e(a+}{(g}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB\log(e(a+bx)^n(c+dx)^{-n})}{h(g+hx)^2} - \frac{B^2\log^2(e(a+bx)^n(c+dx}{2h(g+hx)^2}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB\log(e(a+bx)^n(c+dx)^{-n})}{h(g+hx)^2} - \frac{B^2\log^2(e(a+bx)^n(c+dx}{2h(g+hx)^2}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)} + \frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2} - \frac{ABd^2n}{h(d}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)} + \frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2} - \frac{ABd^2n}{h(d}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)} + \frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2} - \frac{ABd^2n}{h(d}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)} + \frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2} - \frac{ABd^2n}{h(d}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)} + \frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2} - \frac{ABd^2n}{h(d}$$

$$= -\frac{A^2}{2h(g+hx)^2} - \frac{AB(bc-ad)n}{(bg-ah)(dg-ch)(g+hx)} + \frac{Ab^2Bn\log(a+bx)}{h(bg-ah)^2} - \frac{ABd^2n}{h(d}$$

Mathematica [B] time = 6.46763, size = 15422, normalized size = 39.24

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2/(g + h*x)^3,x]
```

```
[Out] Result too large to show
```

Maple [F] time = 1.788, size = 0, normalized size = 0.

$$\int \frac{1}{\left(hx+g\right)^{3}} \left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}B^{2}\left(\frac{\log\left(\left(dx+c\right)^{n}\right)^{2}}{h^{3}x^{2}+2\,gh^{2}x+g^{2}h}+2\int -\frac{dhx\log\left(e\right)^{2}+ch\log\left(e\right)^{2}+\left(dhx+ch\right)\log\left(\left(bx+a\right)^{n}\right)^{2}+2\left(dhx\log\left(e\right)+ch\log\left(e\right)\right)\mathrm{l}}{dh^{4}x^{4}+cg^{3}h+\left(3\,dgh^{3}+c\mathrm{h}\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x, algorithm="maxi
ma")
```

```
[Out] -1/2*B^2*(log((d*x + c)^n)^2/(h^3*x^2 + 2*g*h^2*x + g^2*h) + 2*integrate(-(
d*h*x*log(e)^2 + c*h*log(e)^2 + (d*h*x + c*h)*log((b*x + a)^n)^2 + 2*(d*h*x
*log(e) + c*h*log(e))*log((b*x + a)^n) + (d*g*n + (h*n - 2*h*log(e))*d*x -
2*c*h*log(e) - 2*(d*h*x + c*h)*log((b*x + a)^n))*log((d*x + c)^n))/(d*h^4*x
^4 + c*g^3*h + (3*d*g*h^3 + c*h^4)*x^3 + 3*(d*g^2*h^2 + c*g*h^3)*x^2 + (d*g
^3*h + 3*c*g^2*h^2)*x), x)) + (b^2*e*n*log(b*x + a)/(b^2*g^2*h - 2*a*b*g*h^
2 + a^2*h^3) - d^2*e*n*log(d*x + c)/(d^2*g^2*h - 2*c*d*g*h^2 + c^2*h^3) - (
2*a*b*d^2*e*g*n - a^2*d^2*e*h*n - (2*c*d*e*g*n - c^2*e*h*n)*b^2)*log(h*x +
g)/((d^2*g^2*h^2 - 2*c*d*g*h^3 + c^2*h^4)*a^2 - 2*(d^2*g^3*h - 2*c*d*g^2*h^
2 + c^2*g*h^3)*a*b + (d^2*g^4 - 2*c*d*g^3*h + c^2*g^2*h^2)*b^2) + (b*c*e*n
- a*d*e*n)/((d*g^2*h - c*g*h^2)*a - (d*g^3 - c*g^2*h)*b + ((d*g*h^2 - c*h^3
)*a - (d*g^2*h - c*g*h^2)*b)*x))*A*B/e - A*B*log((b*x + a)^n*e/(d*x + c)^n)
/(h^3*x^2 + 2*g*h^2*x + g^2*h) - 1/2*A^2/(h^3*x^2 + 2*g*h^2*x + g^2*h)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 2\,AB\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^2}{h^3x^3 + 3\,gh^2x^2 + 3\,g^2hx + g^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x, algorithm="fric
as")
```

```
[Out] integral((B^2*log((b*x + a)^n*e/(d*x + c)^n)^2 + 2*A*B*log((b*x + a)^n*e/(d
*x + c)^n) + A^2)/(h^3*x^3 + 3*g*h^2*x^2 + 3*g^2*h*x + g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**2/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^2/(h*x+g)^3,x, algorithm="giac
")
```

```
[Out] Exception raised: TypeError
```

3.309 $\int (g+hx)^2 \left(A + B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx$

Optimal. Leaf size=875

$$-\frac{B^3h^2n^3\log(c+dx)(bc-ad)^3}{b^3d^3} - \frac{B^2h^2n^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)\log\left(1-\frac{b(c+dx)}{d(a+bx)}\right)(bc-ad)^3}{b^3d^3} + \frac{B^3h^2n^3\text{PolyLog}}{}$$

```
[Out] -((B^3*(b*c - a*d)^3*h^2*n^3*Log[c + d*x])/(b^3*d^3)) + (B^2*(b*c - a*d)^2*
h^2*n^2*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b^3*d^2) - (2*
B^2*(b*c - a*d)^2*h*(3*b*d*g - 2*b*c*h - a*d*h)*n^2*Log[(b*c - a*d)/(b*(c +
 d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n]))/(b^3*d^3) - (B*(b*c - a*d
)*h*(3*b*d*g - 2*b*c*h - a*d*h)*n*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c +
 d*x)^n])^2)/(b^3*d^2) - (B*(b*c - a*d)*h^2*n*(c + d*x)^2*(A + B*Log[(e*(a
+ b*x)^n)/(c + d*x)^n])^2)/(2*b*d^3) + (B*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*
h*(3*d*g - c*h) + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n*Log[(b*c - a*d)/
(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(b^3*d^3) - ((b*
g - a*h)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(3*b^3*h) + ((g + h*
x)^3*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/(3*h) - (B^2*(b*c - a*d)^3
*h^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*Log[1 - (b*(c + d*x))/(d*
(a + b*x))])/(b^3*d^3) - (2*B^3*(b*c - a*d)^2*h*(3*b*d*g - 2*b*c*h - a*d*h)
*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b^3*d^3) + (2*B^2*(b*c - a*d
)*(a^2*d^2*h^2 - a*b*d*h*(3*d*g - c*h) + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h
^2))*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[2, (d*(a + b*x))/
(b*(c + d*x))])/(b^3*d^3) + (B^3*(b*c - a*d)^3*h^2*n^3*PolyLog[2, (b*(c + d
*x))/(d*(a + b*x))])/(b^3*d^3) - (2*B^3*(b*c - a*d)*(a^2*d^2*h^2 - a*b*d*h*
(3*d*g - c*h) + b^2*(3*d^2*g^2 - 3*c*d*g*h + c^2*h^2))*n^3*PolyLog[3, (d*(a
 + b*x))/(b*(c + d*x))])/(b^3*d^3)
```

Rubi [A] time = 3.48124, antiderivative size = 1640, normalized size of antiderivative = 1.87, number of steps used = 53, number of rules used = 13, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.394, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] -((A^2*B*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*x)/(b^2*d^2)) + (A*B^2*(
b*c - a*d)^2*h^2*n^2*x)/(b^2*d^2) - (A^2*B*(b*c - a*d)*h^2*n*x^2)/(2*b*d) +
```

```
 (A^3*(g + h*x)^3)/(3*h) - (A^2*B*(b*g - a*h)^3*n*Log[a + b*x])/(b^3*h) + (
a^2*A*B^2*(b*c - a*d)*h^2*n^2*Log[a + b*x])/(b^3*d) + (A^2*B*(d*g - c*h)^3*
n*Log[c + d*x])/(d^3*h) - (A*B^2*c^2*(b*c - a*d)*h^2*n^2*Log[c + d*x])/(b*d
^3) + (2*A*B^2*(b*c - a*d)^2*h*(3*b*d*g - b*c*h - a*d*h)*n^2*Log[c + d*x])/
(b^3*d^3) - (B^3*(b*c - a*d)^3*h^2*n^3*Log[c + d*x])/(b^3*d^3) - (A*B^2*(b*
c - a*d)*h^2*n*x^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) - (2*A*B^2*(b*c
- a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x
)^n])/(b^3*d^2) + (B^3*(b*c - a*d)^2*h^2*n^2*(a + b*x)*Log[(e*(a + b*x)^n)/
(c + d*x)^n])/(b^3*d^2) + (A^2*B*(g + h*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^
n])/h + (2*A*B^2*(b*g - a*h)^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(
a + b*x)^n)/(c + d*x)^n])/(b^3*h) - (a^2*B^3*(b*c - a*d)*h^2*n^2*Log[-((b*c
 - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^3*d) - (2*A*B^
2*(d*g - c*h)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d
*x)^n])/(d^3*h) + (B^3*c^2*(b*c - a*d)*h^2*n^2*Log[(b*c - a*d)/(b*(c + d*x)
)]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d^3) - (2*B^3*(b*c - a*d)^2*h*(3*b*
d*g - b*c*h - a*d*h)*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)
/(c + d*x)^n])/(b^3*d^3) - (B^3*(b*c - a*d)*h^2*n*x^2*Log[(e*(a + b*x)^n)/(
c + d*x)^n]^2)/(2*b*d) - (B^3*(b*c - a*d)*h*(3*b*d*g - b*c*h - a*d*h)*n*(a
+ b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b^3*d^2) + (A*B^2*(g + h*x)^3*L
og[(e*(a + b*x)^n)/(c + d*x)^n]^2)/h + (B^3*(b*g - a*h)^3*n*Log[-((b*c - a*
d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b^3*h) - (B^3*(d*g
- c*h)^3*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
2)/(d^3*h) + (B^3*(g + h*x)^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(3*h) - (
2*A*B^2*(d*g - c*h)^3*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(d^3*h)
+ (B^3*c^2*(b*c - a*d)*h^2*n^3*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*
d^3) - (2*B^3*(b*c - a*d)^2*h*(3*b*d*g - b*c*h - a*d*h)*n^3*PolyLog[2, (d*(
a + b*x))/(b*(c + d*x))])/(b^3*d^3) - (2*A*B^2*(b*g - a*h)^3*n^2*PolyLog[2,
 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*h) + (a^2*B^3*(b*c - a*d)*h^2*n^3*Pol
yLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*d) - (2*B^3*(b*g - a*h)^3*n^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])
/(b^3*h) - (2*B^3*(d*g - c*h)^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLo
g[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^3*h) - (2*B^3*(b*g - a*h)^3*n^3*Pol
yLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^3*h) + (2*B^3*(d*g - c*h)^3*n^3*
PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^3*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
```

```
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
```

```
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (g+hx)^2\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx = \int \left(A^3(g+hx)^2+3A^2B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)+3AB^2\right.$$

$$= \frac{A^3(g+hx)^3}{3h}+\left(3A^2B\right)\int (g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx+$$

$$= \frac{A^3(g+hx)^3}{3h}+\frac{A^2B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}+\frac{AB^2(g+}{}$$

$$= \frac{A^3(g+hx)^3}{3h}+\frac{A^2B(g+hx)^3\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{h}+\frac{AB^2(g+}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}-\frac{A^2B(bc-ad)h^2nx^2}{2bd}+\frac{A^3(}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}-\frac{A^2B(bc-ad)h^2nx^2}{2bd}+\frac{A^3(}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}-\frac{A^2B(bc-ad)h^2nx^2}{2bd}+\frac{A^3(}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}+\frac{AB^2(bc-ad)^2h^2n^2x}{b^2d^2}-\frac{A^2}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}+\frac{AB^2(bc-ad)^2h^2n^2x}{b^2d^2}-\frac{A^2}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}+\frac{AB^2(bc-ad)^2h^2n^2x}{b^2d^2}-\frac{A^2}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}+\frac{AB^2(bc-ad)^2h^2n^2x}{b^2d^2}-\frac{A^2}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}+\frac{AB^2(bc-ad)^2h^2n^2x}{b^2d^2}-\frac{A^2}{}$$

$$= -\frac{A^2B(bc-ad)h(3bdg-bch-adh)nx}{b^2d^2}+\frac{AB^2(bc-ad)^2h^2n^2x}{b^2d^2}-\frac{A^2}{}$$

Mathematica [F] time = 5.6802, size = 0, normalized size = 0.

$$\int (g+hx)^2 \left(A+B\log \left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] Integrate[(g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3, x]
```

Maple [F] time = 5.47, size = 0, normalized size = 0.

$$\int \left(hx+g\right)^2 \left(A+B\ln \left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((h*x+g)^2*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxi
ma")
```

```
[Out] A^2*B*h^2*x^3*log((b*x + a)^n*e/(d*x + c)^n) + 1/3*A^3*h^2*x^3 + 3*A^2*B*g*
h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + A^3*g*h*x^2 + 3*A^2*B*g^2*x*log((b*x
 + a)^n*e/(d*x + c)^n) + A^3*g^2*x + 3*(a*e*n*log(b*x + a)/b - c*e*n*log(d*
x + c)/d)*A^2*B*g^2/e - 3*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d*x + c)/
d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*g*h/e + 1/2*(2*a^3*e*n*log(b*x + a
)/b^3 - 2*c^3*e*n*log(d*x + c)/d^3 - ((b^2*c*d*e*n - a*b*d^2*e*n)*x^2 - 2*(
b^2*c^2*e*n - a^2*d^2*e*n)*x)/(b^2*d^2))*A^2*B*h^2/e - 1/6*(2*(B^3*b^3*d^3*
h^2*x^3 + 3*B^3*b^3*d^3*g*h*x^2 + 3*B^3*b^3*d^3*g^2*x)*log((d*x + c)^n)^3 +
```

```
3*(2*(3*c*d^2*g^2*n - 3*c^2*d*g*h*n + c^3*h^2*n)*B^3*b^3*log(d*x + c) - 2*
(3*a*b^2*d^3*g^2*n - 3*a^2*b*d^3*g*h*n + a^3*d^3*h^2*n)*B^3*log(b*x + a) -
2*(B^3*b^3*d^3*h^2*log(e) + A*B^2*b^3*d^3*h^2)*x^3 - (6*A*B^2*b^3*d^3*g*h +
 (a*b^2*d^3*h^2*n - (c*d^2*h^2*n - 6*d^3*g*h*log(e))*b^3)*B^3)*x^2 - 2*(3*A
*B^2*b^3*d^3*g^2 + (3*a*b^2*d^3*g*h*n - a^2*b*d^3*h^2*n - (3*c*d^2*g*h*n -
c^2*d*h^2*n - 3*d^3*g^2*log(e))*b^3)*B^3)*x - 2*(B^3*b^3*d^3*h^2*x^3 + 3*B^
3*b^3*d^3*g*h*x^2 + 3*B^3*b^3*d^3*g^2*x)*log((b*x + a)^n))*log((d*x + c)^n)
^2)/(b^3*d^3) - integrate(-(B^3*b^3*c*d^2*g^2*log(e)^3 + 3*A*B^2*b^3*c*d^2*
g^2*log(e)^2 + (B^3*b^3*d^3*h^2*log(e)^3 + 3*A*B^2*b^3*d^3*h^2*log(e)^2)*x^
3 + (B^3*b^3*d^3*h^2*x^3 + B^3*b^3*c*d^2*g^2 + (2*d^3*g*h + c*d^2*h^2)*B^3*
b^3*x^2 + (d^3*g^2 + 2*c*d^2*g*h)*B^3*b^3*x)*log((b*x + a)^n)^3 + (3*(2*d^3
*g*h*log(e)^2 + c*d^2*h^2*log(e)^2)*A*B^2*b^3 + (2*d^3*g*h*log(e)^3 + c*d^2
*h^2*log(e)^3)*B^3*b^3)*x^2 + 3*(B^3*b^3*c*d^2*g^2*log(e) + A*B^2*b^3*c*d^2
*g^2 + (B^3*b^3*d^3*h^2*log(e) + A*B^2*b^3*d^3*h^2)*x^3 + ((2*d^3*g*h + c*d
^2*h^2)*A*B^2*b^3 + (2*d^3*g*h*log(e) + c*d^2*h^2*log(e))*B^3*b^3)*x^2 + ((
d^3*g^2 + 2*c*d^2*g*h)*A*B^2*b^3 + (d^3*g^2*log(e) + 2*c*d^2*g*h*log(e))*B^
3*b^3)*x)*log((b*x + a)^n)^2 + (3*(d^3*g^2*log(e)^2 + 2*c*d^2*g*h*log(e)^2)
*A*B^2*b^3 + (d^3*g^2*log(e)^3 + 2*c*d^2*g*h*log(e)^3)*B^3*b^3)*x + 3*(B^3*
b^3*c*d^2*g^2*log(e)^2 + 2*A*B^2*b^3*c*d^2*g^2*log(e) + (B^3*b^3*d^3*h^2*lo
g(e)^2 + 2*A*B^2*b^3*d^3*h^2*log(e))*x^3 + (2*(2*d^3*g*h*log(e) + c*d^2*h^2
*log(e))*A*B^2*b^3 + (2*d^3*g*h*log(e)^2 + c*d^2*h^2*log(e)^2)*B^3*b^3)*x^2
 + (2*(d^3*g^2*log(e) + 2*c*d^2*g*h*log(e))*A*B^2*b^3 + (d^3*g^2*log(e)^2 +
 2*c*d^2*g*h*log(e)^2)*B^3*b^3)*x)*log((b*x + a)^n) - (3*B^3*b^3*c*d^2*g^2*
log(e)^2 + 6*A*B^2*b^3*c*d^2*g^2*log(e) - 2*(3*c*d^2*g^2*n^2 - 3*c^2*d*g*h*
n^2 + c^3*h^2*n^2)*B^3*b^3*log(d*x + c) + 2*(3*a*b^2*d^3*g^2*n^2 - 3*a^2*b*
d^3*g*h*n^2 + a^3*d^3*h^2*n^2)*B^3*log(b*x + a) + (2*(h^2*n + 3*h^2*log(e))
*A*B^2*b^3*d^3 + (2*h^2*n*log(e) + 3*h^2*log(e)^2)*B^3*b^3*d^3)*x^3 + (6*(c
*d^2*h^2*log(e) + (g*h*n + 2*g*h*log(e))*d^3)*A*B^2*b^3 + (a*b^2*d^3*h^2*n^
2 - ((h^2*n^2 - 3*h^2*log(e)^2)*c*d^2 - 6*(g*h*n*log(e) + g*h*log(e)^2)*d^3
)*b^3)*B^3)*x^2 + 3*(B^3*b^3*d^3*h^2*x^3 + B^3*b^3*c*d^2*g^2 + (2*d^3*g*h +
 c*d^2*h^2)*B^3*b^3*x^2 + (d^3*g^2 + 2*c*d^2*g*h)*B^3*b^3*x)*log((b*x + a)^
n)^2 + (6*(2*c*d^2*g*h*log(e) + (g^2*n + g^2*log(e))*d^3)*A*B^2*b^3 + (6*a*
b^2*d^3*g*h*n^2 - 2*a^2*b*d^3*h^2*n^2 + (2*c^2*d*h^2*n^2 - 6*(g*h*n^2 - g*h
*log(e)^2)*c*d^2 + 3*(2*g^2*n*log(e) + g^2*log(e)^2)*d^3)*b^3)*B^3)*x + 2*(
3*B^3*b^3*c*d^2*g^2*log(e) + 3*A*B^2*b^3*c*d^2*g^2 + (3*A*B^2*b^3*d^3*h^2 +
 (h^2*n + 3*h^2*log(e))*B^3*b^3*d^3)*x^3 + 3*((2*d^3*g*h + c*d^2*h^2)*A*B^2
*b^3 + (c*d^2*h^2*log(e) + (g*h*n + 2*g*h*log(e))*d^3)*B^3*b^3)*x^2 + 3*((d
^3*g^2 + 2*c*d^2*g*h)*A*B^2*b^3 + (2*c*d^2*g*h*log(e) + (g^2*n + g^2*log(e)
)*d^3)*B^3*b^3)*x)*log((b*x + a)^n))*log((d*x + c)^n))/(b^3*d^3*x + b^3*c*d
^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^3h^2x^2 + 2\,A^3ghx + A^3g^2 + \left(B^3h^2x^2 + 2\,B^3ghx + B^3g^2\right)\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\left(AB^2h^2x^2 + 2\,AB^2ghx + AB^2g\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fric
as")
```

```
[Out] integral(A^3*h^2*x^2 + 2*A^3*g*h*x + A^3*g^2 + (B^3*h^2*x^2 + 2*B^3*g*h*x +
 B^3*g^2)*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*(A*B^2*h^2*x^2 + 2*A*B^2*g*h
*x + A*B^2*g^2)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*h^2*x^2 + 2*A^2
*B*g*h*x + A^2*B*g^2)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)**2*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)^2*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac
")
```

```
[Out] Timed out
```

3.310 $\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$

Optimal. Leaf size=466

$$\frac{3B^2n^2(bc-ad)(-adh-bch+2bdg)\text{PolyLog}\left(2,\frac{d(a+bx)}{b(c+dx)}\right)\left(B\log\left(e(a+bx)^n(c+dx)^{-n}\right)+A\right)}{b^2d^2}-\frac{3B^3n^3(bc-ad)(-adh-bch}{b}$$

```
[Out] (-3*B^2*(b*c - a*d)^2*h*n^2*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]))/(b^2*d^2) - (3*B*(b*c - a*d)*h*n*(a + b*x)*(A + B
*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/(2*b^2*d) + (3*B*(b*c - a*d)*(2*b*d*g
 - b*c*h - a*d*h)*n*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^
n)/(c + d*x)^n])^2)/(2*b^2*d^2) - ((b*g - a*h)^2*(A + B*Log[(e*(a + b*x)^n)
/(c + d*x)^n])^3)/(2*b^2*h) + ((g + h*x)^2*(A + B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])^3)/(2*h) - (3*B^3*(b*c - a*d)^2*h*n^3*PolyLog[2, (d*(a + b*x))/(b*
(c + d*x))])/(b^2*d^2) + (3*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*(
A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[2, (d*(a + b*x))/(b*(c + d*
x))])/(b^2*d^2) - (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^3*PolyLog[
3, (d*(a + b*x))/(b*(c + d*x))])/(b^2*d^2)
```

Rubi [B] time = 2.11237, antiderivative size = 1030, normalized size of antiderivative = 2.21, number of steps used = 35, number of rules used = 13, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.419, Rules used = {6742, 2492, 72, 2514, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{(g+hx)^2A^3}{2h}-\frac{3B(bc-ad)hnxA^2}{2bd}-\frac{3B(bg-ah)^2n\log(a+bx)A^2}{2b^2h}+\frac{3B(dg-ch)^2n\log(c+dx)A^2}{2d^2h}+\frac{3B(g+hx)^2\log(e(a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (-3*A^2*B*(b*c - a*d)*h*n*x)/(2*b*d) + (A^3*(g + h*x)^2)/(2*h) - (3*A^2*B*(
b*g - a*h)^2*n*Log[a + b*x])/(2*b^2*h) + (3*A^2*B*(d*g - c*h)^2*n*Log[c + d
*x])/(2*d^2*h) + (3*A*B^2*(b*c - a*d)^2*h*n^2*Log[c + d*x])/(b^2*d^2) - (3*
A*B^2*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*d) +
 (3*A^2*B*(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(2*h) + (3*A*B^2*(b
*g - a*h)^2*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*
x)^n])/(b^2*h) - (3*A*B^2*(d*g - c*h)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n])/(d^2*h) - (3*B^3*(b*c - a*d)^2*h*n^2*Log[(b
*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b^2*d^2) - (3*B
^3*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*b^2*d)
```

```
+ (3*A*B^2*(g + h*x)^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h) + (3*B^3*(
b*g - a*h)^2*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d
*x)^n]^2)/(2*b^2*h) - (3*B^3*(d*g - c*h)^2*n*Log[(b*c - a*d)/(b*(c + d*x))]
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*d^2*h) + (B^3*(g + h*x)^2*Log[(e*(a
 + b*x)^n)/(c + d*x)^n]^3)/(2*h) - (3*A*B^2*(d*g - c*h)^2*n^2*PolyLog[2, (d
*(a + b*x))/(b*(c + d*x))])/(d^2*h) - (3*B^3*(b*c - a*d)^2*h*n^3*PolyLog[2,
 (d*(a + b*x))/(b*(c + d*x))])/(b^2*d^2) - (3*A*B^2*(b*g - a*h)^2*n^2*PolyL
og[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*h) - (3*B^3*(b*g - a*h)^2*n^2*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(
b^2*h) - (3*B^3*(d*g - c*h)^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[
2, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^2*h) - (3*B^3*(b*g - a*h)^2*n^3*PolyL
og[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(b^2*h) + (3*B^3*(d*g - c*h)^2*n^3*Po
lyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(d^2*h)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
```

```
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx = \int \left(A^3(g+hx)+3A^2B(g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)+3AB^2(g\right.$$

$$= \frac{A^3(g+hx)^2}{2h} + \left(3A^2B\right)\int (g+hx)\log\left(e(a+bx)^n(c+dx)^{-n}\right)\,dx + \left(3\right.$$

$$= \frac{A^3(g+hx)^2}{2h} + \frac{3A^2B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h} + \frac{3AB^2(g}{}$$

$$= \frac{A^3(g+hx)^2}{2h} + \frac{3A^2B(g+hx)^2\log\left(e(a+bx)^n(c+dx)^{-n}\right)}{2h} + \frac{3AB^2(g}{}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

$$= -\frac{3A^2B(bc-ad)hnx}{2bd} + \frac{A^3(g+hx)^2}{2h} - \frac{3A^2B(bg-ah)^2n\log(a+bx)}{2b^2h}$$

Mathematica [F] time = 3.0359, size = 0, normalized size = 0.

$$\int (g+hx)\left(A+B\log\left(e(a+bx)^n(c+dx)^{-n}\right)\right)^3\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

[Out] Integrate[(g + h*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3, x]

Maple [F] time = 5.28, size = 0, normalized size = 0.

$$\int (hx+g)\left(A+B\ln\left(\frac{e\,(bx+a)^{n}}{(dx+c)^{n}}\right)\right)^{3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)

[Out] int((h*x+g)*(A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxima
")

[Out] 3/2*A^2*B*h*x^2*log((b*x + a)^n*e/(d*x + c)^n) + 1/2*A^3*h*x^2 + 3*A^2*B*g*
x*log((b*x + a)^n*e/(d*x + c)^n) + A^3*g*x + 3*(a*e*n*log(b*x + a)/b - c*e*
n*log(d*x + c)/d)*A^2*B*g/e - 3/2*(a^2*e*n*log(b*x + a)/b^2 - c^2*e*n*log(d
*x + c)/d^2 + (b*c*e*n - a*d*e*n)*x/(b*d))*A^2*B*h/e - 1/2*((B^3*b^2*d^2*h*
x^2 + 2*B^3*b^2*d^2*g*x)*log((d*x + c)^n)^3 + 3*((2*c*d*g*n - c^2*h*n)*B^3*
b^2*log(d*x + c) - (2*a*b*d^2*g*n - a^2*d^2*h*n)*B^3*log(b*x + a) - (B^3*b^
2*d^2*h*log(e) + A*B^2*b^2*d^2*h)*x^2 - (2*A*B^2*b^2*d^2*g + (a*b*d^2*h*n -
 (c*d*h*n - 2*d^2*g*log(e))*b^2)*B^3)*x - (B^3*b^2*d^2*h*x^2 + 2*B^3*b^2*d^
2*g*x)*log((b*x + a)^n))*log((d*x + c)^n)^2)/(b^2*d^2) - integrate(-(B^3*b^
2*c*d*g*log(e)^3 + 3*A*B^2*b^2*c*d*g*log(e)^2 + (B^3*b^2*d^2*h*x^2 + B^3*b^
2*c*d*g + (d^2*g + c*d*h)*B^3*b^2*x)*log((b*x + a)^n)^3 + (B^3*b^2*d^2*h*lo
g(e)^3 + 3*A*B^2*b^2*d^2*h*log(e)^2)*x^2 + 3*(B^3*b^2*c*d*g*log(e) + A*B^2*
b^2*c*d*g + (B^3*b^2*d^2*h*log(e) + A*B^2*b^2*d^2*h)*x^2 + ((d^2*g + c*d*h)
*A*B^2*b^2 + (d^2*g*log(e) + c*d*h*log(e))*B^3*b^2)*x)*log((b*x + a)^n)^2 +
 (3*(d^2*g*log(e)^2 + c*d*h*log(e)^2)*A*B^2*b^2 + (d^2*g*log(e)^3 + c*d*h*l
og(e)^3)*B^3*b^2)*x + 3*(B^3*b^2*c*d*g*log(e)^2 + 2*A*B^2*b^2*c*d*g*log(e)
+ (B^3*b^2*d^2*h*log(e)^2 + 2*A*B^2*b^2*d^2*h*log(e))*x^2 + (2*(d^2*g*log(e

```
) + c*d*h*log(e))*A*B^2*b^2 + (d^2*g*log(e)^2 + c*d*h*log(e)^2)*B^3*b^2)*x)
*log((b*x + a)^n) - 3*(B^3*b^2*c*d*g*log(e)^2 + 2*A*B^2*b^2*c*d*g*log(e) -
(2*c*d*g*n^2 - c^2*h*n^2)*B^3*b^2*log(d*x + c) + (2*a*b*d^2*g*n^2 - a^2*d^2
*h*n^2)*B^3*log(b*x + a) + ((h*n + 2*h*log(e))*A*B^2*b^2*d^2 + (h*n*log(e)
+ h*log(e)^2)*B^3*b^2*d^2)*x^2 + (B^3*b^2*d^2*h*x^2 + B^3*b^2*c*d*g + (d^2*
g + c*d*h)*B^3*b^2*x)*log((b*x + a)^n)^2 + (2*(c*d*h*log(e) + (g*n + g*log(
e))*d^2)*A*B^2*b^2 + (a*b*d^2*h*n^2 - ((h*n^2 - h*log(e)^2)*c*d - (2*g*n*lo
g(e) + g*log(e)^2)*d^2)*b^2)*B^3)*x + (2*B^3*b^2*c*d*g*log(e) + 2*A*B^2*b^2
*c*d*g + ((h*n + 2*h*log(e))*B^3*b^2*d^2 + 2*A*B^2*b^2*d^2*h)*x^2 + 2*((d^2
*g + c*d*h)*A*B^2*b^2 + (c*d*h*log(e) + (g*n + g*log(e))*d^2)*B^3*b^2)*x)*l
og((b*x + a)^n))*log((d*x + c)^n))/(b^2*d^2*x + b^2*c*d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(A^3hx + A^3g + \left(B^3hx + B^3g\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^3 + 3\left(AB^2hx + AB^2g\right)\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)^2 + 3\left(A^2Bhx + A^2Bg\right)\text{lo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fricas
")
```

```
[Out] integral(A^3*h*x + A^3*g + (B^3*h*x + B^3*g)*log((b*x + a)^n*e/(d*x + c)^n)
^3 + 3*(A*B^2*h*x + A*B^2*g)*log((b*x + a)^n*e/(d*x + c)^n)^2 + 3*(A^2*B*h*
x + A^2*B*g)*log((b*x + a)^n*e/(d*x + c)^n), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (hx+g)\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((h*x+g)*(A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac")
```

```
[Out] integrate((h*x + g)*(B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

3.311 $\int (A + B\log(e(a+bx)^n(c+dx)^{-n}))^3 \, dx$

Optimal. Leaf size=203

$$\frac{6B^2n^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{bd} - \frac{6B^3n^3(bc-ad)\text{PolyLog}\left(3, \frac{d(a+bx)}{b(c+dx)}\right)}{bd} + \frac{3Bn(bc-}{}$$

```
[Out] (3*B*(b*c - a*d)*n*Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n
)/(c + d*x)^n])^2)/(b*d) + ((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])^3)/b + (6*B^2*(b*c - a*d)*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*
PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(b*d) - (6*B^3*(b*c - a*d)*n^3*Pol
yLog[3, (d*(a + b*x))/(b*(c + d*x))])/(b*d)
```

Rubi [B] time = 0.590136, antiderivative size = 408, normalized size of antiderivative = 2.01, number of steps used = 14, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {6742, 2486, 31, 2488, 2411, 2343, 2333, 2315, 2506, 6610}

$$\frac{6AB^2n^2(bc-ad)\text{PolyLog}\left(2, \frac{d(a+bx)}{b(c+dx)}\right)}{bd} + \frac{6B^3n^2(bc-ad)\text{PolyLog}\left(2, 1-\frac{bc-ad}{b(c+dx)}\right)\log(e(a+bx)^n(c+dx)^{-n})}{bd} - \frac{6B^3n^3(bc-}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] A^3*x - (3*A^2*B*(b*c - a*d)*n*Log[c + d*x])/(b*d) + (3*A^2*B*(a + b*x)*Log
[(e*(a + b*x)^n)/(c + d*x)^n])/b + (6*A*B^2*(b*c - a*d)*n*Log[(b*c - a*d)/(
b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(b*d) + (3*A*B^2*(a + b*x)*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/b + (3*B^3*(b*c - a*d)*n*Log[(b*c - a*d
)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(b*d) + (B^3*(a + b*x)
*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/b + (6*A*B^2*(b*c - a*d)*n^2*PolyLog[2
, (d*(a + b*x))/(b*(c + d*x))])/(b*d) + (6*B^3*(b*c - a*d)*n^2*Log[(e*(a +
b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d) - (6*
B^3*(b*c - a*d)*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(b*d)
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2486

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.), x_Symbol] :> Simp[((a + b*x)*Log[e*(f*(a + b*x)^p*(c + d*x)^
q)^r]^s)/b, x] + Dist[(q*r*s*(b*c - a*d))/b, Int[Log[e*(f*(a + b*x)^p*(c +
d*x)^q)^r]^(s - 1)/(c + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, p, q, r, s
}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (A+B\log(e(a+bx)^n(c+dx)^{-n}))^3\,dx = \int \left(A^3+3A^2B\log(e(a+bx)^n(c+dx)^{-n})+3AB^2\log^2(e(a+bx)^n(c+dx)^{-n})\right.$$

$$= A^3x+\left(3A^2B\right)\int \log(e(a+bx)^n(c+dx)^{-n})\,dx+\left(3AB^2\right)\int \log^2(e(a+bx)^n($$

$$= A^3x+\frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{b}+\frac{3AB^2(a+bx)\log^2(e(a+b}{b}$$

$$= A^3x-\frac{3A^2B(bc-ad)n\log(c+dx)}{bd}+\frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n}}{b}$$

$$= A^3x-\frac{3A^2B(bc-ad)n\log(c+dx)}{bd}+\frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n}}{b}$$

$$= A^3x-\frac{3A^2B(bc-ad)n\log(c+dx)}{bd}+\frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n}}{b}$$

$$= A^3x-\frac{3A^2B(bc-ad)n\log(c+dx)}{bd}+\frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n}}{b}$$

$$= A^3x-\frac{3A^2B(bc-ad)n\log(c+dx)}{bd}+\frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n}}{b}$$

Mathematica [A] time = 0.279521, size = 378, normalized size = 1.86

$$\frac{3AB^2n(bc-ad)\left(2n\text{PolyLog}\left(2,\frac{b(c+dx)}{bc-ad}\right)-\log\left(\frac{bc-ad}{bc+bdx}\right)\left(-2\log\left(e(a+bx)^n(c+dx)^{-n}\right)+2n\log\left(\frac{d(a+bx)}{ad-bc}\right)+n\log\left(\frac{bc-ad}{bc+bdx}\right)\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3,x]
```

```
[Out] (A^3*b*d*x - 3*A^2*B*(b*c - a*d)*n*Log[c + d*x] + 3*A^2*B*d*(a + b*x)*Log[(
e*(a + b*x)^n)/(c + d*x)^n] + 3*A*B^2*d*(a + b*x)*Log[(e*(a + b*x)^n)/(c +
d*x)^n]^2 + B^3*d*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3 + 3*A*B^2*(b
*c - a*d)*n*(-(Log[(b*c - a*d)/(b*c + b*d*x)]*(2*n*Log[(d*(a + b*x))/(-(b*c
) + a*d)] - 2*Log[(e*(a + b*x)^n)/(c + d*x)^n] + n*Log[(b*c - a*d)/(b*c + b
*d*x)])) + 2*n*PolyLog[2, (b*(c + d*x))/(b*c - a*d)]) + 3*B^3*(b*c - a*d)*n
*(Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[(b*c - a*d)/(b*c + b*d*x)] + 2*n*L
og[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))] - 2
*n^2*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))]))/(b*d)
```

Maple [F] time = 2.737, size = 0, normalized size = 0.

$$\int \left(A+B\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$3\,A^2Bx\log\left(\frac{(bx+a)^ne}{(dx+c)^n}\right)+A^3x+\frac{3\left(\frac{aen\log(bx+a)}{b}-\frac{cen\log(dx+c)}{d}\right)A^2B}{e}-\frac{B^3bdx\log\left((dx+c)^n\right)^3-3\left(B^3adn\log(bx+a)-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="maxima")
```

```
[Out] 3*A^2*B*x*log((b*x + a)^n*e/(d*x + c)^n) + A^3*x + 3*(a*e*n*log(b*x + a)/b
- c*e*n*log(d*x + c)/d)*A^2*B/e - (B^3*b*d*x*log((d*x + c)^n)^3 - 3*(B^3*a*
d*n*log(b*x + a) - B^3*b*c*n*log(d*x + c) + B^3*b*d*x*log((b*x + a)^n) + (B
^3*b*d*log(e) + A*B^2*b*d)*x)*log((d*x + c)^n)^2)/(b*d) - integrate(-(B^3*b
*c*log(e)^3 + 3*A*B^2*b*c*log(e)^2 + (B^3*b*d*x + B^3*b*c)*log((b*x + a)^n)
^3 + 3*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*log(e) + A*B^2*b*d)*x)*log((b
*x + a)^n)^2 + (B^3*b*d*log(e)^3 + 3*A*B^2*b*d*log(e)^2)*x + 3*(B^3*b*c*log
(e)^2 + 2*A*B^2*b*c*log(e) + (B^3*b*d*log(e)^2 + 2*A*B^2*b*d*log(e))*x)*log
((b*x + a)^n) - 3*(2*B^3*a*d*n^2*log(b*x + a) - 2*B^3*b*c*n^2*log(d*x + c)
+ B^3*b*c*log(e)^2 + 2*A*B^2*b*c*log(e) + (B^3*b*d*x + B^3*b*c)*log((b*x +
a)^n)^2 + ((2*n*log(e) + log(e)^2)*B^3*b*d + 2*A*B^2*b*d*(n + log(e)))*x +
2*(B^3*b*c*log(e) + A*B^2*b*c + (B^3*b*d*(n + log(e)) + A*B^2*b*d)*x)*log((
b*x + a)^n))*log((d*x + c)^n))/(b*d*x + b*c), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(B^3 \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2 \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2 B \log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="fricas")
```

```
[Out] integral(B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/(
d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3,x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3, x)
```

3.312 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{g+hx}\,dx$

Optimal. Leaf size=425

$$-\frac{6B^2n^2\text{PolyLog}\left(3,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{h}+\frac{6B^2n^2\text{PolyLog}\left(3,\frac{d(a+bx)}{b(c+dx)}\right)(B\log(e(a+bx)^n(c+$$

```
[Out] -((Log[(b*c - a*d)/(b*(c + d*x))]*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^
3)/h) + ((A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3*Log[1 - ((d*g - c*h)*(a
 + b*x))/((b*g - a*h)*(c + d*x))])/h - (3*B*n*(A + B*Log[(e*(a + b*x)^n)/(c
 + d*x)^n])^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/h + (3*B*n*(A + B*Lo
g[(e*(a + b*x)^n)/(c + d*x)^n])^2*PolyLog[2, ((d*g - c*h)*(a + b*x))/((b*g
 - a*h)*(c + d*x))])/h + (6*B^2*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])
*PolyLog[3, (d*(a + b*x))/(b*(c + d*x))])/h - (6*B^2*n^2*(A + B*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])*PolyLog[3, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c +
 d*x))])/h - (6*B^3*n^3*PolyLog[4, (d*(a + b*x))/(b*(c + d*x))])/h + (6*B^3
*n^3*PolyLog[4, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))])/h
```

Rubi [B] time = 1.64183, antiderivative size = 921, normalized size of antiderivative = 2.17, number of steps used = 25, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6742, 2494, 2394, 2393, 2391, 2489, 2488, 2506, 6610, 2503, 2508}

$$\frac{\log(g+hx)A^3}{h}-\frac{3Bn\log\left(-\frac{h(a+bx)}{bg-ah}\right)\log(g+hx)A^2}{h}+\frac{3Bn\log\left(-\frac{h(c+dx)}{dg-ch}\right)\log(g+hx)A^2}{h}+\frac{3B\log(e(a+bx)^n(c+dx)^{-n})\,\mathrm{l}}{h}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x),x]
```

```
[Out] (-3*A*B^2*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2
)/h - (B^3*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^
3)/h + (A^3*Log[g + h*x])/h - (3*A^2*B*n*Log[-((h*(a + b*x))/(b*g - a*h))]*
Log[g + h*x])/h + (3*A^2*B*n*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x]
)/h + (3*A^2*B*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/h + (3*A*B^2*
Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)*(g + h*x))/((b*g - a*h)
*(c + d*x))])/h + (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3*Log[((b*c - a*d)*
(g + h*x))/((b*g - a*h)*(c + d*x))])/h - (3*A^2*B*n*PolyLog[2, (b*(g + h*x)
)/(b*g - a*h)])/h + (3*A^2*B*n*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/h - (
6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c
 + d*x))])/h - (3*B^3*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[2, 1 - (
```

```
b*c - a*d)/(b*(c + d*x))])/h + (6*A*B^2*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*
PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h + (3*B^3
*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x)
)/((b*g - a*h)*(c + d*x))])/h + (6*A*B^2*n^2*PolyLog[3, 1 - (b*c - a*d)/(b*
(c + d*x))])/h + (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[3, 1 -
 (b*c - a*d)/(b*(c + d*x))])/h - (6*A*B^2*n^2*PolyLog[3, 1 - ((b*c - a*d)*(
g + h*x))/((b*g - a*h)*(c + d*x))])/h - (6*B^3*n^2*Log[(e*(a + b*x)^n)/(c +
 d*x)^n]*PolyLog[3, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h
 - (6*B^3*n^3*PolyLog[4, 1 - (b*c - a*d)/(b*(c + d*x))])/h + (6*B^3*n^3*Pol
yLog[4, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/h
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2489

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r]^s/(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[Log[e
*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a
, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0
] && NeQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 1]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2508

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_)*PolyLog[n_, v_], x_Symbol] :> With[{g = Simplify[(v*(c +
 d*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, Simp[(h*PolyLog[n
+ 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] - Dist[h*p*
r*s, Int[(PolyLog[n + 1, v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/(
(a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e,
f, n, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{g+hx}\,dx = \int\left(\frac{A^3}{g+hx} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{g+hx} + \frac{3AB^2\log^2(e(a+bx)^n(c+\ldots}{g+hx}\right.$$

$$= \frac{A^3\log(g+hx)}{h} + \left(3A^2B\right)\int\frac{\log(e(a+bx)^n(c+dx)^{-n})}{g+hx}\,dx + \left(3AB^2\right)\int \frac{\log\ldots}{}$$

$$= \frac{A^3\log(g+hx)}{h} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})\log(g+hx)}{h} + \frac{\left(3AB^2d\right)\ldots}{}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} - \frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^3(e(a\ldots}{h}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} - \frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^3(e(a\ldots}{h}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} - \frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^3(e(a\ldots}{h}$$

$$= -\frac{3AB^2\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^2(e(a+bx)^n(c+dx)^{-n})}{h} - \frac{B^3\log\left(\frac{bc-ad}{b(c+dx)}\right)\log^3(e(a\ldots}{h}$$

Mathematica [F] time = 1.45157, size = 0, normalized size = 0.

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{g+hx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x),x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x), x]
```

Maple [F] time = 3.127, size = 0, normalized size = 0.

$$\int \frac{1}{hx+g}\left(A+B\ln\left(\frac{e\,(bx+a)^n}{(dx+c)^n}\right)\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{A^3\log\left(hx+g\right)}{h}-\int -\frac{B^3\log\left((bx+a)^n\right)^3-B^3\log\left((dx+c)^n\right)^3+B^3\log(e)^3+3\,AB^2\log(e)^2+3\,A^2B\log(e)+3\left(B^3\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x, algorithm="maxima
")
```

```
[Out] A^3*log(h*x + g)/h - integrate(-(B^3*log((b*x + a)^n)^3 - B^3*log((d*x + c)
^n)^3 + B^3*log(e)^3 + 3*A*B^2*log(e)^2 + 3*A^2*B*log(e) + 3*(B^3*log(e) +
A*B^2)*log((b*x + a)^n)^2 + 3*(B^3*log((b*x + a)^n) + B^3*log(e) + A*B^2)*l
og((d*x + c)^n)^2 + 3*(B^3*log(e)^2 + 2*A*B^2*log(e) + A^2*B)*log((b*x + a)
^n) - 3*(B^3*log((b*x + a)^n)^2 + B^3*log(e)^2 + 2*A*B^2*log(e) + A^2*B + 2
*(B^3*log(e) + A*B^2)*log((b*x + a)^n))*log((d*x + c)^n))/(h*x + g), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3+3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2+3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A^3}{hx+g},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x, algorithm="fricas
")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(h*x + g), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(h*x+g),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A\right)^3}{hx+g}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g),x, algorithm="giac")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(h*x + g), x)
```

3.313 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(g+hx)^2}\,dx$

Optimal. Leaf size=302

$$\frac{6B^2n^2(bc-ad)\text{PolyLog}\left(2,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{(bg-ah)(dg-ch)}-\frac{6B^3n^3(bc-ad)\text{PolyLog}\left(3,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}+$$

```
[Out] ((a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3)/((b*g - a*h)*(g + h*
x)) + (3*B*(b*c - a*d)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 -
 ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h)
) + (6*B^2*(b*c - a*d)*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog
[2, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c
*h)) - (6*B^3*(b*c - a*d)*n^3*PolyLog[3, ((d*g - c*h)*(a + b*x))/((b*g - a*
h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h))
```

Rubi [B] time = 0.807412, antiderivative size = 650, normalized size of antiderivative = 2.15, number of steps used = 14, number of rules used = 9, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {6742, 2490, 36, 31, 2503, 2502, 2315, 2506, 6610}

$$\frac{6AB^2n^2(bc-ad)\text{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}+\frac{6B^3n^2(bc-ad)\log(e(a+bx)^n(c+dx)^{-n})\text{PolyLog}\left(2,1-\frac{(g+hx)(bc-ad)}{(c+dx)(bg-ah)}\right)}{(bg-ah)(dg-ch)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^2,x]
```

```
[Out] -(A^3/(h*(g + h*x))) - (3*A^2*B*(b*c - a*d)*n*Log[c + d*x])/((b*g - a*h)*(d
*g - c*h)) + (3*A^2*B*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n])/((b*g - a
*h)*(g + h*x)) + (3*A*B^2*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/((b
*g - a*h)*(g + h*x)) + (B^3*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(
(b*g - a*h)*(g + h*x)) + (3*A^2*B*(b*c - a*d)*n*Log[g + h*x])/((b*g - a*h)*
(d*g - c*h)) + (6*A*B^2*(b*c - a*d)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[
((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h))
 + (3*B^3*(b*c - a*d)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)
*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h)) + (6*A*B^2*
(b*c - a*d)*n^2*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*
x))])/((b*g - a*h)*(d*g - c*h)) + (6*B^3*(b*c - a*d)*n^2*Log[(e*(a + b*x)^n
)/(c + d*x)^n]*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x
))])/((b*g - a*h)*(d*g - c*h)) - (6*B^3*(b*c - a*d)*n^3*PolyLog[3, 1 - ((b*
```

```
c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)*(d*g - c*h))
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
```

```
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(g+hx)^2}\,dx = \int \left(\frac{A^3}{(g+hx)^2} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2} + \frac{3AB^2\log^2(e(a+bx)^n(c}{(g+hx)^2}\right.$$

$$= -\frac{A^3}{h(g+hx)} + (3A^2B)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^2}\,dx + (3AB^2)\int \frac{\log^2(e}{}$$

$$= -\frac{A^3}{h(g+hx)} + \frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{(bg-ah)(g+hx)} + \frac{3AB^2(a+bx)\log}{(bg-}$$

$$= -\frac{A^3}{h(g+hx)} + \frac{3A^2B(a+bx)\log(e(a+bx)^n(c+dx)^{-n})}{(bg-ah)(g+hx)} + \frac{3AB^2(a+bx)\log}{(bg-}$$

$$= -\frac{A^3}{h(g+hx)} - \frac{3A^2B(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)} + \frac{3A^2B(a+bx)\log(e(a+bx)^n(}{(bg-ah)(g+hx)}$$

$$= -\frac{A^3}{h(g+hx)} - \frac{3A^2B(bc-ad)n\log(c+dx)}{(bg-ah)(dg-ch)} + \frac{3A^2B(a+bx)\log(e(a+bx)^n(}{(bg-ah)(g+hx)}$$

Mathematica [F] time = 3.62669, size = 0, normalized size = 0.

$$\int \frac{(A + B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(g+hx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^2,x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^2, x]
```

Maple [F] time = 2.753, size = 0, normalized size = 0.

$$\int \frac{1}{(hx+g)^2}\left(A + B\ln\left(\frac{e(bx+a)^n}{(dx+c)^n}\right)\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x, algorithm="maxi
ma")
```

```
[Out] B^3*log((d*x + c)^n)^3/(h^2*x + g*h) + 3*(b*e*n*log(b*x + a)/(b*g*h - a*h^2
) - d*e*n*log(d*x + c)/(d*g*h - c*h^2) - (b*c*e*n - a*d*e*n)*log(h*x + g)/(
(d*g*h - c*h^2)*a - (d*g^2 - c*g*h)*b))*A^2*B/e - 3*A^2*B*log((b*x + a)^n*e
/(d*x + c)^n)/(h^2*x + g*h) - A^3/(h^2*x + g*h) + integrate((B^3*c*h*log(e)
^3 + 3*A*B^2*c*h*log(e)^2 + (B^3*d*h*x + B^3*c*h)*log((b*x + a)^n)^3 + 3*(B
^3*c*h*log(e) + A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n
)^2 + 3*(A*B^2*c*h - (d*g*n - c*h*log(e))*B^3 - ((h*n - h*log(e))*B^3*d - A
*B^2*d*h)*x + (B^3*d*h*x + B^3*c*h)*log((b*x + a)^n))*log((d*x + c)^n)^2 +
(B^3*d*h*log(e)^3 + 3*A*B^2*d*h*log(e)^2)*x + 3*(B^3*c*h*log(e)^2 + 2*A*B^2
*c*h*log(e) + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x)*log((b*x + a)^n) -
 3*(B^3*c*h*log(e)^2 + 2*A*B^2*c*h*log(e) + (B^3*d*h*x + B^3*c*h)*log((b*x
+ a)^n)^2 + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x + 2*(B^3*c*h*log(e) +
 A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n))*log((d*x + c
)^n))/(d*h^3*x^3 + c*g^2*h + (2*d*g*h^2 + c*h^3)*x^2 + (d*g^2*h + 2*c*g*h^2
)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{h^2x^2 + 2\,ghx + g^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x, algorithm="fric
as")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(h^2*x^2 + 2
```

```
*g*h*x + g^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(h*x+g)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)+A\right)^3}{(hx+g)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^2,x, algorithm="giac
")
```

```
[Out] integrate((B*log((b*x + a)^n*e/(d*x + c)^n) + A)^3/(h*x + g)^2, x)
```

3.314 $\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(g+hx)^3}\,dx$

Optimal. Leaf size=629

$$\frac{3B^2n^2(bc-ad)(-adh-bch+2bdg)\text{PolyLog}\left(2,\frac{(a+bx)(dg-ch)}{(c+dx)(bg-ah)}\right)(B\log(e(a+bx)^n(c+dx)^{-n})+A)}{(bg-ah)^2(dg-ch)^2}+\frac{3B^3hn^3(bc-ad)^2\text{Poly}}{(bg-ah)^2(}$$

```
[Out] (3*B*(b*c - a*d)*h*n*(a + b*x)*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2)/
(2*(b*g - a*h)^2*(d*g - c*h)*(g + h*x)) + (b^2*(A + B*Log[(e*(a + b*x)^n)/(
c + d*x)^n])^3)/(2*h*(b*g - a*h)^2) - (A + B*Log[(e*(a + b*x)^n)/(c + d*x)^
n])^3/(2*h*(g + h*x)^2) + (3*B^2*(b*c - a*d)^2*h*n^2*(A + B*Log[(e*(a + b*x
)^n)/(c + d*x)^n])*Log[1 - ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))]
)/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h
)*n*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^2*Log[1 - ((d*g - c*h)*(a + b*
x))/((b*g - a*h)*(c + d*x))]])/(2*(b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b*c
 - a*d)^2*h*n^3*PolyLog[2, ((d*g - c*h)*(a + b*x))/((b*g - a*h)*(c + d*x))]
)/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d
*h)*n^2*(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])*PolyLog[2, ((d*g - c*h)*(a
 + b*x))/((b*g - a*h)*(c + d*x))]])/((b*g - a*h)^2*(d*g - c*h)^2) - (3*B^3*(
b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^3*PolyLog[3, ((d*g - c*h)*(a + b*x))
/((b*g - a*h)*(c + d*x))]])/((b*g - a*h)^2*(d*g - c*h)^2)
```

Rubi [B] time = 3.7451, antiderivative size = 2207, normalized size of antiderivative = 3.51, number of steps used = 49, number of rules used = 21, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636, Rules used = {6742, 2492, 72, 2514, 2488, 2411, 2343, 2333, 2315, 2490, 36, 31, 2494, 2394, 2393, 2391, 2506, 6610, 2503, 2502, 2489}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^3,x]
```

```
[Out] -A^3/(2*h*(g + h*x)^2) - (3*A^2*B*(b*c - a*d)*n)/(2*(b*g - a*h)*(d*g - c*h)
*(g + h*x)) + (3*A^2*b^2*B*n*Log[a + b*x])/(2*h*(b*g - a*h)^2) - (3*A^2*B*d
^2*n*Log[c + d*x])/(2*h*(d*g - c*h)^2) - (3*A*B^2*(b*c - a*d)^2*h*n^2*Log[c
 + d*x])/((b*g - a*h)^2*(d*g - c*h)^2) - (3*A^2*B*Log[(e*(a + b*x)^n)/(c +
d*x)^n])/(2*h*(g + h*x)^2) + (3*A*B^2*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a +
 b*x)^n)/(c + d*x)^n])/((b*g - a*h)^2*(d*g - c*h)*(g + h*x)) - (3*A*b^2*B^2
*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(
```

b*g - a*h)^2) + (3*A*B^2*d^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n])/(h*(d*g - c*h)^2) - (3*A*B^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h*(g + h*x)^2) + (3*B^3*(b*c - a*d)*h*n*(a + b*x)*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*g - a*h)^2*(d*g - c*h)*(g + h*x)) - (3*b^2*B^3*n*Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h*(b*g - a*h)^2) + (3*B^3*d^2*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*h*(d*g - c*h)^2) - (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[(b*c - a*d)/(b*(c + d*x))]*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2)/(2*(b*g - a*h)^2*(d*g - c*h)^2) - (B^3*Log[(e*(a + b*x)^n)/(c + d*x)^n]^3)/(2*h*(g + h*x)^2) + (3*A^2*B*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[g + h*x])/(2*(b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)^2*h*n^2*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) - (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[-((h*(a + b*x))/(b*g - a*h))]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[-((h*(c + d*x))/(d*g - c*h))]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[g + h*x])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)^2*h*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*Log[((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n*Log[(e*(a + b*x)^n)/(c + d*x)^n]^2*Log[((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/(2*(b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*d^2*n^2*PolyLog[2, (d*(a + b*x))/(b*(c + d*x))])/(h*(d*g - c*h)^2) - (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog[2, (b*(g + h*x))/(b*g - a*h)])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*B^2*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*PolyLog[2, (d*(g + h*x))/(d*g - c*h)])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*A*b^2*B^2*n^2*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(h*(b*g - a*h)^2) + (3*b^2*B^3*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 + (b*c - a*d)/(d*(a + b*x))])/(h*(b*g - a*h)^2) + (3*B^3*d^2*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/(h*(d*g - c*h)^2) - (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - (b*c - a*d)/(b*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)^2*h*n^3*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^2*Log[(e*(a + b*x)^n)/(c + d*x)^n]*PolyLog[2, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) + (3*b^2*B^3*n^3*PolyLog[3, 1 + (b*c - a*d)/(d*(a + b*x))])/(h*(b*g - a*h)^2) - (3*B^3*d^2*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/(h*(d*g - c*h)^2) + (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^3*PolyLog[3, 1 - (b*c - a*d)/(b*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2) - (3*B^3*(b*c - a*d)*(2*b*d*g - b*c*h - a*d*h)*n^3*PolyLog[3, 1 - ((b*c - a*d)*(g + h*x))/((b*g - a*h)*(c + d*x))])/((b*g - a*h)^2*(d*g - c*h)^2)

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2492

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*((g_.) + (h_.)*(x_))^(m_.), x_Symbol] :> Simp[((g + h*x)^(m +
 1)*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(h*(m + 1)), x] - Dist[(p*r*s*(
b*c - a*d))/(h*(m + 1)), Int[((g + h*x)^(m + 1)*Log[e*(f*(a + b*x)^p*(c + d
*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c, d, e, f
, g, h, m, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && IGtQ[s,
 0] && NeQ[m, -1]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2514

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(RFx_), x_Symbol] :> With[{u = ExpandIntegrand[Log[e*(f*(a +
b*x)^p*(c + d*x)^q)^r]^s, RFx, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c
, d, e, f, p, q, r, s}, x] && RationalFunctionQ[RFx, x] && IGtQ[s, 0]
```

Rule 2488

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_)), x_Symbol] :> -Simp[(Log[-((b*c - a*d)/(
d*(a + b*x)))]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/h, x] + Dist[(p*r*s*
(b*c - a*d))/h, Int[(Log[-((b*c - a*d)/(d*(a + b*x)))]*Log[e*(f*(a + b*x)^p
*(c + d*x)^q)^r]^(s - 1))/((a + b*x)*(c + d*x)), x], x] /; FreeQ[{a, b, c,
d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && EqQ
[b*g - a*h, 0] && IGtQ[s, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2490

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)/((g_.) + (h_.)*(x_))^2, x_Symbol] :> Simp[((a + b*x)*Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^s)/((b*g - a*h)*(g + h*x)), x] - Dist[(p*r*s*(
b*c - a*d))/(b*g - a*h), Int[Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)/(
(c + d*x)*(g + h*x)), x], x] /; FreeQ[{a, b, c, d, e, f, g, h, p, q, r, s},
 x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0] && NeQ[b*g - a*h, 0] && IGtQ[s, 0
]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2494

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]/((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[(Log[g + h*x]*Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r])/h, x] + (-Dist[(b*p*r)/h, Int[Log[g + h*x]/(a + b*
x), x], x] - Dist[(d*q*r)/h, Int[Log[g + h*x]/(c + d*x), x], x]) /; FreeQ[{
```

```
a, b, c, d, e, f, g, h, p, q, r}, x] && NeQ[b*c - a*d, 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2506

```
Int[Log[v_]*Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_)
)^(q_.))^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Simplify[((v - 1)*(c + d
*x))/(a + b*x)], h = Simplify[u*(a + b*x)*(c + d*x)]}, -Simp[(h*PolyLog[2,
1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^s)/(b*c - a*d), x] + Dist[h*p*r
*s, Int[(PolyLog[2, 1 - v]*Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1))/((
a + b*x)*(c + d*x)), x], x] /; FreeQ[{g, h}, x]] /; FreeQ[{a, b, c, d, e, f
, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rule 2503

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_.)*(u_), x_Symbol] :> With[{g = Coeff[Simplify[1/(u*(a + b*x))],
 x, 0], h = Coeff[Simplify[1/(u*(a + b*x))], x, 1]}, -Simp[(Log[e*(f*(a + b
*x)^p*(c + d*x)^q)^r]^s*Log[-(((b*c - a*d)*(g + h*x))/((d*g - c*h)*(a + b*x
)))])/(b*g - a*h), x] + Dist[(p*r*s*(b*c - a*d))/(b*g - a*h), Int[(Log[e*(f
*(a + b*x)^p*(c + d*x)^q)^r]^(s - 1)*Log[-(((b*c - a*d)*(g + h*x))/((d*g -
c*h)*(a + b*x)))])/((a + b*x)*(c + d*x)), x], x] /; NeQ[b*g - a*h, 0] && Ne
```

```
Q[d*g - c*h, 0]] /; FreeQ[{a, b, c, d, e, f, p, q, r, s}, x] && NeQ[b*c - a
*d, 0] && IGtQ[s, 0] && EqQ[p + q, 0] && LinearQ[Simplify[1/(u*(a + b*x))],
 x]
```

Rule 2502

```
Int[Log[((e_.)*((c_.) + (d_.)*(x_)))/((a_.) + (b_.)*(x_))]*(u_), x_Symbol]
:> With[{g = Coeff[Simplify[1/(u*(a + b*x))], x, 0], h = Coeff[Simplify[1/(
u*(a + b*x))], x, 1]}, -Dist[(b - d*e)/(h*(b*c - a*d)), Subst[Int[Log[e*x]/
(1 - e*x), x], x, (c + d*x)/(a + b*x)], x] /; EqQ[g*(b - d*e) - h*(a - c*e)
, 0]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b*c - a*d, 0] && LinearQ[Simplify
[1/(u*(a + b*x))], x]
```

Rule 2489

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]^(s_)/((g_.) + (h_.)*(x_)), x_Symbol] :> Dist[d/h, Int[Log[e*(f*(a +
 b*x)^p*(c + d*x)^q)^r]^s/(c + d*x), x], x] - Dist[(d*g - c*h)/h, Int[Log[e
*(f*(a + b*x)^p*(c + d*x)^q)^r]^s/((c + d*x)*(g + h*x)), x], x] /; FreeQ[{a
, b, c, d, e, f, g, h, p, q, r, s}, x] && NeQ[b*c - a*d, 0] && EqQ[p + q, 0
] && NeQ[b*g - a*h, 0] && NeQ[d*g - c*h, 0] && IGtQ[s, 1]
```

Rubi steps

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(g+hx)^3}\,dx = \int \left(\frac{A^3}{(g+hx)^3} + \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^3} + \frac{3AB^2\log^2(e(a+bx)^n(c\,}{(g+hx)^3}\right.$$

$$= -\frac{A^3}{2h(g+hx)^2} + \left(3A^2B\right)\int \frac{\log(e(a+bx)^n(c+dx)^{-n})}{(g+hx)^3}\,dx + \left(3AB^2\right)\int \frac{\log^2(\,}{}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{2h(g+hx)^2} - \frac{3AB^2\log^2(e(a+bx)^n(c\,}{2h(g+hx)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B\log(e(a+bx)^n(c+dx)^{-n})}{2h(g+hx)^2} - \frac{3AB^2\log^2(e(a+bx)^n(c\,}{2h(g+hx)^2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx)}{2h(bg-ah)^2} - \frac{3A^2}{2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx)}{2h(bg-ah)^2} - \frac{3A^2}{2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx)}{2h(bg-ah)^2} - \frac{3A^2}{2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx)}{2h(bg-ah)^2} - \frac{3A^2}{2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx)}{2h(bg-ah)^2} - \frac{3A^2}{2}$$

$$= -\frac{A^3}{2h(g+hx)^2} - \frac{3A^2B(bc-ad)n}{2(bg-ah)(dg-ch)(g+hx)} + \frac{3A^2b^2Bn\log(a+bx)}{2h(bg-ah)^2} - \frac{3A^2}{2}$$

Mathematica [F] time = 8.24731, size = 0, normalized size = 0.

$$\int \frac{(A+B\log(e(a+bx)^n(c+dx)^{-n}))^3}{(g+hx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^3,x]
```

```
[Out] Integrate[(A + B*Log[(e*(a + b*x)^n)/(c + d*x)^n])^3/(g + h*x)^3, x]
```

Maple [F] time = 3.369, size = 0, normalized size = 0.

$$\int \frac{1}{\left(hx+g\right)^{3}}\left(A+B\ln\left(\frac{e\left(bx+a\right)^{n}}{\left(dx+c\right)^{n}}\right)\right)^{3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x)
```

```
[Out] int((A+B*ln(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x, algorithm="maxi
ma")
```

```
[Out] 1/2*B^3*log((d*x + c)^n)^3/(h^3*x^2 + 2*g*h^2*x + g^2*h) + 3/2*(b^2*e*n*log
(b*x + a)/(b^2*g^2*h - 2*a*b*g*h^2 + a^2*h^3) - d^2*e*n*log(d*x + c)/(d^2*g
^2*h - 2*c*d*g*h^2 + c^2*h^3) - (2*a*b*d^2*e*g*n - a^2*d^2*e*h*n - (2*c*d*e
*g*n - c^2*e*h*n)*b^2)*log(h*x + g)/((d^2*g^2*h^2 - 2*c*d*g*h^3 + c^2*h^4)*
a^2 - 2*(d^2*g^3*h - 2*c*d*g^2*h^2 + c^2*g*h^3)*a*b + (d^2*g^4 - 2*c*d*g^3*
h + c^2*g^2*h^2)*b^2) + (b*c*e*n - a*d*e*n)/((d*g^2*h - c*g*h^2)*a - (d*g^3
 - c*g^2*h)*b + ((d*g*h^2 - c*h^3)*a - (d*g^2*h - c*g*h^2)*b)*x))*A^2*B/e -
 3/2*A^2*B*log((b*x + a)^n*e/(d*x + c)^n)/(h^3*x^2 + 2*g*h^2*x + g^2*h) - 1
/2*A^3/(h^3*x^2 + 2*g*h^2*x + g^2*h) + integrate(1/2*(2*B^3*c*h*log(e)^3 +
6*A*B^2*c*h*log(e)^2 + 2*(B^3*d*h*x + B^3*c*h)*log((b*x + a)^n)^3 + 6*(B^3*
c*h*log(e) + A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n)^2
 + 3*(2*A*B^2*c*h - (d*g*n - 2*c*h*log(e))*B^3 - ((h*n - 2*h*log(e))*B^3*d
- 2*A*B^2*d*h)*x + 2*(B^3*d*h*x + B^3*c*h)*log((b*x + a)^n))*log((d*x + c)^
n)^2 + 2*(B^3*d*h*log(e)^3 + 3*A*B^2*d*h*log(e)^2)*x + 6*(B^3*c*h*log(e)^2
+ 2*A*B^2*c*h*log(e) + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x)*log((b*x
+ a)^n) - 6*(B^3*c*h*log(e)^2 + 2*A*B^2*c*h*log(e) + (B^3*d*h*x + B^3*c*h)*
log((b*x + a)^n)^2 + (B^3*d*h*log(e)^2 + 2*A*B^2*d*h*log(e))*x + 2*(B^3*c*h
```

```
*log(e) + A*B^2*c*h + (B^3*d*h*log(e) + A*B^2*d*h)*x)*log((b*x + a)^n))*log
((d*x + c)^n))/(d*h^4*x^4 + c*g^3*h + (3*d*g*h^3 + c*h^4)*x^3 + 3*(d*g^2*h^
2 + c*g*h^3)*x^2 + (d*g^3*h + 3*c*g^2*h^2)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{B^3\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^3 + 3\,AB^2\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right)^2 + 3\,A^2B\log\left(\frac{(bx+a)^n e}{(dx+c)^n}\right) + A^3}{h^3x^3 + 3\,gh^2x^2 + 3\,g^2hx + g^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x, algorithm="fric
as")
```

```
[Out] integral((B^3*log((b*x + a)^n*e/(d*x + c)^n)^3 + 3*A*B^2*log((b*x + a)^n*e/
(d*x + c)^n)^2 + 3*A^2*B*log((b*x + a)^n*e/(d*x + c)^n) + A^3)/(h^3*x^3 + 3
*g*h^2*x^2 + 3*g^2*h*x + g^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*ln(e*(b*x+a)**n/((d*x+c)**n)))**3/(h*x+g)**3,x)
```

```
[Out] Timed out
```

Giac [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*log(e*(b*x+a)^n/((d*x+c)^n)))^3/(h*x+g)^3,x, algorithm="giac
")
```

```
[Out] Timed out
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
```

```
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
```

```

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal, debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=", ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
```

```
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
```

```
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
```

```
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
```

```
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
```

```
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
```

```
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
```

```
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

def tree(expr):
    debug=False;
    if debug:
         print ("Enter tree(expr), expr=",expr)
         print ("expr.operator()=",expr.operator())
         print ("expr.operands()=",expr.operands())
         print ("map(tree, expr.operands()=",map(tree, expr.operands()))

    if expr.operator() is None:
        return expr
    else:
        return [expr.operator()]+list(map(tree, expr.operands()))

def leaf_count(anti):
    debug=False;

    if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))

    if len(anti) == 0: #special check for optimal being 0 for some test cases.
       if debug: print ("len(anti) == 0")
       return 1
    else:
        if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len(
    flatten(tree(anti)))))
        return round(1.35*len(flatten(tree(anti)))) #fudge factor
                     #since this estimate of leaf count is bit lower than
                     #what it should be compared to Mathematica's

def is_sqrt(expr):
    debug=False;
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

```

```
def is_elementary_function(func):
    debug = False

    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug = False

    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
    sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U
    ']

def is_appell_function(func):
```

```
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath

def is_atom(expn):

    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):
    debug=False

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0], Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1], Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0], Rational)
                return 1
```

```
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):
    debug = False;

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, " leaf_count_optimal=",leaf_count_optimal)
```

```


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=", expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```