

Computer algebra independent integration tests

1_Algebraic_functions/1.2_Trinomial_products/1.2.1Quadratic/1.2.1.5(a+bx+cx^2)^p(d+

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Contents

1	Introduction	2
2	detailed summary tables of results	11
3	Listing of integrals	40
4	Listing of Grading functions	611

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 Albert Rich Rubi web site.

1.1 Listing of CAS systems tested

The following systems were tested at this time.

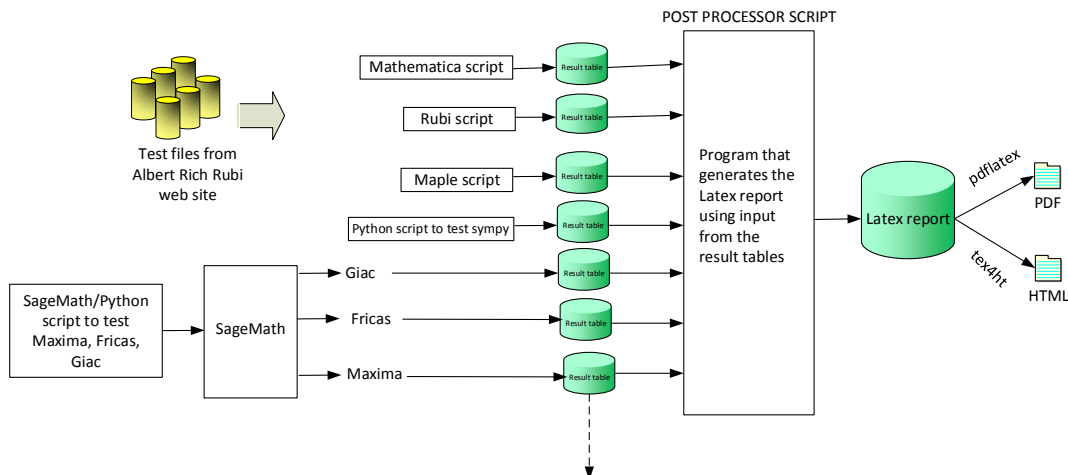
1. Mathematica 11.3 (64 bit).
2. Rubi 4.15.2 in Mathematica 11.3.
3. Rubi in Sympy (Version 1.3) under Python 3.7.0 using Anaconda distribution.
4. Maple 2018.1 (64 bit).
5. Maxima 5.41 Using Lisp ECL 16.1.2.
6. Fricas 1.3.4.
7. Sympy 1.3 under Python 3.7.0 using Anaconda distribution.
8. Giac/Xcas 1.4.9.

Maxima, Fricas and Giac/Xcas were called from inside SageMath version 8.3. 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. Rubi in Sympy was also called directly using sympy 1.3 in python.

1.2 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 comma delimited. It contains 12 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"

High level overview of the CAS independent integration test build system

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June 22, 2018

1.3 Timing

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

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

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

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

1.4 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.

1.5 Important notes about some of the results

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 percentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. 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.

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.

Important note about finding leaf size of antiderivative For Mathematica, Rubi and Maple, the builtin system function `LeafSize` is used to find the leaf size of each antiderivative.

The other CAS systems (SageMath and Sympy) do not have special builtin function for this purpose at this time. Therefore the leaf size 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-expressi
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 implement a builtin function to find the leaf size of expressions, it will be used instead, and these tests run again.

1.6 Grading of results

The table below summarizes the grading of each CAS system.

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

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

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

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

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

System	solved	Failed
Rubi	% 100. (123)	% 0. (0)
Rubi in Sympy	% 64.23 (79)	% 35.77 (44)
Mathematica	% 100. (123)	% 0. (0)
Maple	% 98.37 (121)	% 1.63 (2)
Maxima	% 55.28 (68)	% 44.72 (55)
Fricas	% 90.24 (111)	% 9.76 (12)
Sympy	% 34.96 (43)	% 65.04 (80)
Giac	% 72.36 (89)	% 27.64 (34)

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

grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons <ol style="list-style-type: none"> 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 currently implemented only for for Mathematica, Rubi and Maple results. For all other CAS systems (Maxima, Fricas, Sympy, Giac, Rubi in sympy), the grading function is not yet implemented.

For these systems, a grade of A is assigned if the integrate command completes successfully and a grade of F otherwise.

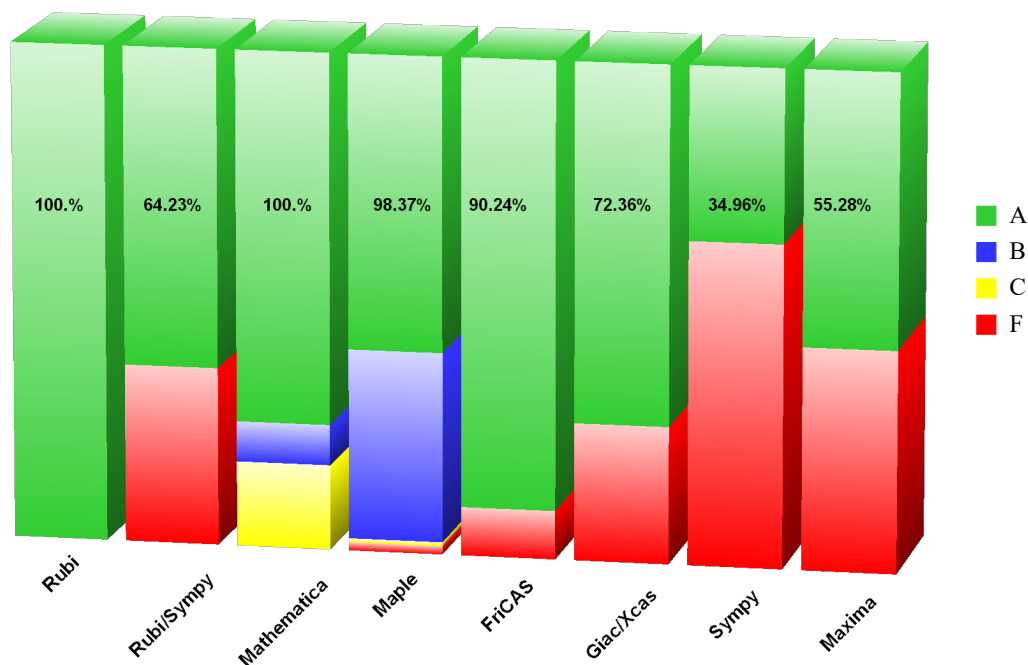
Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Rubi in Sympy	64.23	0.	0.	35.77
Mathematica	74.8	8.13	17.07	0.
Maple	59.35	38.21	0.81	1.63
Maxima	55.28	0.	0.	44.72
Fricas	90.24	0.	0.	9.76
Sympy	34.96	0.	0.	65.04
Giac	72.36	0.	0.	27.64

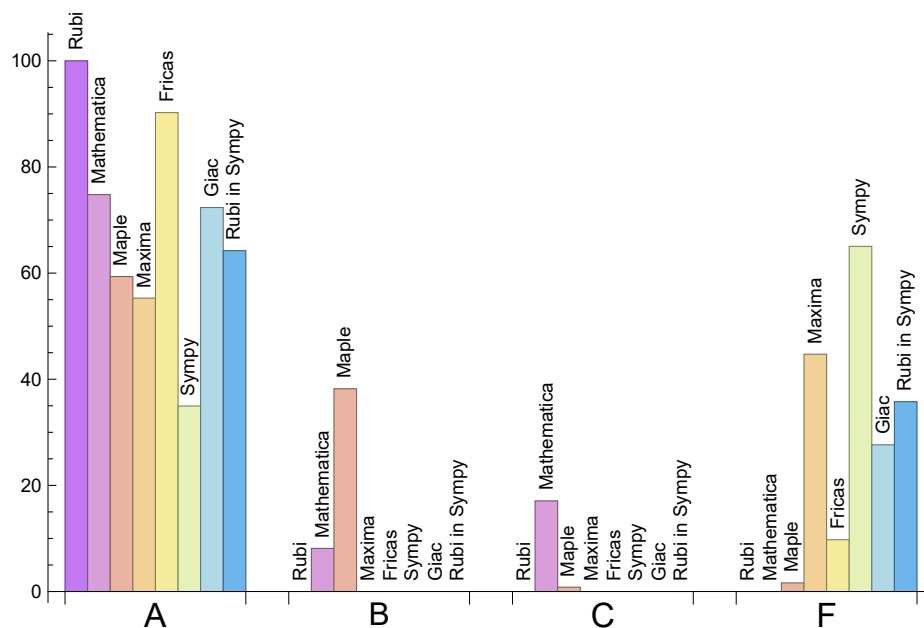
The following is a Bar chart illustration of the data in the above table.

Antiderivative Grade distribution for each CAS

Numbers shown on bars are total percentage solved for each CAS



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



1.7 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	1.39	205.62	1.	128.	1.
Rubi in Sympy	66.47	158.19	1.	143.	0.96
Mathematica	1.73	385.28	1.81	95.	1.
Maple	0.05	6241.9	19.27	136.	0.82
Maxima	0.76	120.1	1.21	97.	1.11
Fricas	0.54	478.77	2.47	117.	1.31
Sympy	0.23	76.74	0.99	73.	0.97
Giac	0.29	136.07	1.1	85.	1.04

1.8 list of integrals that has no closed form antiderivative

{

1.9 list of integrals not solved by each system

Not solved by Rubi {}

Not solved by Rubi in Sympy {5, 6, 13, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 44, 45, 46, 51, 52, 100, 103, 104, 106, 107, 108, 109, 110, 113, 114, 115, 117, 118, 122}

Not solved by Mathematica {}

Not solved by Maple {9, 10}

Not solved by Maxima {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 62, 63, 64, 69, 70, 71, 76, 77, 78, 83, 84, 85, 90, 91, 92, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123}

Not solved by Fricas {9, 10, 13, 102, 103, 106, 107, 108, 113, 117, 122, 123}

Not solved by Sympy {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 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, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123}

Not solved by Giac {2, 3, 4, 5, 6, 7, 9, 10, 13, 62, 63, 64, 69, 70, 71, 76, 77, 78, 83, 84, 85, 90, 91, 92, 97, 98, 99, 102, 106, 107, 112, 117, 122, 123}

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

Rubi {}

Rubi in Sympy {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.11 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 {13, 103, 106, 107, 108, 113, 122, 123}

Mathematica {106, 107, 108, 122, 123}

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.

Rubi in Sympy Verification phase not implemented yet.

2 detailed summary tables of results

2.1 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	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	85	136	0	1	0	113	82
normalized size	1	1.	0.83	1.33	0.	0.01	0.	1.11	0.8
time (sec)	N/A	0.222	0.243	0.013	0.	0.37	0.	0.285	21.507

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	304	491	0	1	0	0	76
normalized size	1	1.	3.71	5.99	0.	0.01	0.	0.	0.93
time (sec)	N/A	0.244	0.678	0.062	0.	0.456	0.	0.	25.074

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	249	307	0	1	0	0	61
normalized size	1	1.	3.77	4.65	0.	0.02	0.	0.	0.92
time (sec)	N/A	0.168	0.473	0.038	0.	0.358	0.	0.	20.152

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	339	829	0	1	0	0	114
normalized size	1	1.	2.63	6.43	0.	0.01	0.	0.	0.88
time (sec)	N/A	0.398	0.553	0.039	0.	0.591	0.	0.	73.181

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	486	1884	0	1	0	0	0
normalized size	1	1.	2.17	8.41	0.	0.	0.	0.	0.
time (sec)	N/A	0.971	1.119	0.037	0.	1.792	0.	0.	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	328	328	901	3695	0	1	0	0	0
normalized size	1	1.	2.75	11.27	0.	0.	0.	0.	0.
time (sec)	N/A	2.111	6.348	0.047	0.	11.338	0.	0.	0.

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	463	1377	0	1	0	0	150
normalized size	1	1.	2.86	8.5	0.	0.01	0.	0.	0.93
time (sec)	N/A	0.685	1.143	0.049	0.	1.005	0.	0.	134.701

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	27	0	51	0	70	31
normalized size	1	1.	1.	0.96	0.	1.82	0.	2.5	1.11
time (sec)	N/A	0.045	0.063	0.019	0.	0.274	0.	0.266	15.435

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	142	0	0	0	0	0	126
normalized size	1	1.	1.04	0.	0.	0.	0.	0.	0.93
time (sec)	N/A	0.222	0.243	0.353	0.	0.	0.	0.	28.281

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	172	0	0	0	0	0	194
normalized size	1	1.	0.86	0.	0.	0.	0.	0.	0.97
time (sec)	N/A	0.297	0.453	0.409	0.	0.	0.	0.	43.474

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	27	16	14	73	0	66	41
normalized size	1	1.	0.56	0.33	0.29	1.52	0.	1.38	0.85
time (sec)	N/A	0.052	0.027	0.103	0.783	0.26	0.	0.267	11.459

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	72	84	0	348	0	193	60
normalized size	1	1.	1.03	1.2	0.	4.97	0.	2.76	0.86
time (sec)	N/A	0.125	0.072	0.026	0.	0.273	0.	0.271	22.108

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	F	F	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1077	1077	600	666	0	0	0	0	0
normalized size	1	1.	0.56	0.62	0.	0.	0.	0.	0.
time (sec)	N/A	6.638	3.421	0.268	0.	0.	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	1087	341	0	213	0	231	116
normalized size	1	1.	11.09	3.48	0.	2.17	0.	2.36	1.18
time (sec)	N/A	0.489	6.275	0.04	0.	0.29	0.	0.273	72.318

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	55	73	1	65	73	0
normalized size	1	1.	1.	0.81	1.07	0.01	0.96	1.07	0.
time (sec)	N/A	0.08	0.005	0.002	0.698	0.231	0.068	0.263	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	45	59	1	53	59	0
normalized size	1	1.	1.	0.8	1.05	0.02	0.95	1.05	0.
time (sec)	N/A	0.065	0.003	0.002	0.691	0.231	0.063	0.263	0.

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	35	46	1	41	46	0
normalized size	1	1.	1.	0.8	1.05	0.02	0.93	1.05	0.
time (sec)	N/A	0.048	0.002	0.001	0.689	0.231	0.056	0.262	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	26	32	0
normalized size	1	1.	1.	0.83	1.07	0.03	0.87	1.07	0.
time (sec)	N/A	0.031	0.002	0.001	0.688	0.238	0.041	0.262	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	34	45	55	49	45	0
normalized size	1	1.	1.	0.81	1.07	1.31	1.17	1.07	0.
time (sec)	N/A	0.08	0.028	0.006	0.782	0.262	0.135	0.266	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	34	49	69	42	49	37
normalized size	1	1.	1.	0.79	1.14	1.6	0.98	1.14	0.86
time (sec)	N/A	0.051	0.031	0.009	0.788	0.258	0.174	0.265	9.294

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	53	47	76	108	63	62	56
normalized size	1	1.	0.83	0.73	1.19	1.69	0.98	0.97	0.88
time (sec)	N/A	0.066	0.052	0.009	0.787	0.268	0.225	0.265	9.851

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	80	65	86	1	76	86	0
normalized size	1	1.	1.	0.81	1.08	0.01	0.95	1.08	0.
time (sec)	N/A	0.098	0.005	0.002	0.697	0.251	0.08	0.263	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	55	73	1	63	73	0
normalized size	1	1.	1.	0.83	1.11	0.02	0.95	1.11	0.
time (sec)	N/A	0.081	0.005	0.002	0.694	0.231	0.073	0.262	0.

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	45	59	1	51	59	0
normalized size	1	1.	1.	0.83	1.09	0.02	0.94	1.09	0.
time (sec)	N/A	0.072	0.004	0.001	0.694	0.235	0.063	0.264	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	35	46	1	41	46	0
normalized size	1	1.	1.	0.76	1.	0.02	0.89	1.	0.
time (sec)	N/A	0.047	0.003	0.001	0.699	0.234	0.054	0.263	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	53	44	58	73	63	58	0
normalized size	1	1.	0.95	0.79	1.04	1.3	1.12	1.04	0.
time (sec)	N/A	0.094	0.043	0.005	0.771	0.258	0.149	0.265	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	59	51	70	117	65	70	0
normalized size	1	1.	0.94	0.81	1.11	1.86	1.03	1.11	0.
time (sec)	N/A	0.111	0.055	0.009	0.776	0.26	0.21	0.265	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	53	47	76	109	63	62	0
normalized size	1	1.	0.83	0.73	1.19	1.7	0.98	0.97	0.
time (sec)	N/A	0.094	0.051	0.008	0.772	0.258	0.243	0.266	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	63	57	103	149	83	76	100
normalized size	1	1.	0.74	0.67	1.21	1.75	0.98	0.89	1.18
time (sec)	N/A	0.112	0.086	0.011	0.768	0.266	0.291	0.263	49.803

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	96	75	100	1	92	100	0
normalized size	1	1.	1.	0.78	1.04	0.01	0.96	1.04	0.
time (sec)	N/A	0.128	0.005	0.002	0.69	0.235	0.089	0.264	0.

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	82	65	86	1	78	86	0
normalized size	1	1.	1.	0.79	1.05	0.01	0.95	1.05	0.
time (sec)	N/A	0.107	0.003	0.002	0.7	0.234	0.075	0.262	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	55	73	1	65	73	0
normalized size	1	1.	1.	0.81	1.07	0.01	0.96	1.07	0.
time (sec)	N/A	0.088	0.004	0.002	0.688	0.234	0.068	0.261	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	45	59	1	53	59	0
normalized size	1	1.	1.	0.8	1.05	0.02	0.95	1.05	0.
time (sec)	N/A	0.06	0.002	0.002	0.687	0.233	0.062	0.264	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	63	54	72	86	76	72	0
normalized size	1	1.	0.9	0.77	1.03	1.23	1.09	1.03	0.
time (sec)	N/A	0.103	0.04	0.005	0.769	0.263	0.158	0.266	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	61	84	131	78	84	0
normalized size	1	1.	1.	0.79	1.09	1.7	1.01	1.09	0.
time (sec)	N/A	0.125	0.054	0.009	0.771	0.266	0.22	0.265	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	78	63	97	171	85	84	0
normalized size	1	1.	0.93	0.75	1.15	2.04	1.01	1.	0.
time (sec)	N/A	0.149	0.073	0.01	0.778	0.266	0.283	0.267	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	72	64	85	100	87	85	0
normalized size	1	1.	0.86	0.76	1.01	1.19	1.04	1.01	0.
time (sec)	N/A	0.112	0.052	0.007	0.774	0.262	0.169	0.266	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	63	54	72	86	73	72	0
normalized size	1	1.	0.9	0.77	1.03	1.23	1.04	1.03	0.
time (sec)	N/A	0.097	0.044	0.005	0.773	0.261	0.157	0.265	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	52	44	58	73	60	58	58
normalized size	1	1.	0.93	0.79	1.04	1.3	1.07	1.04	1.04
time (sec)	N/A	0.088	0.032	0.005	0.766	0.271	0.154	0.265	27.191

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	34	45	55	46	45	0
normalized size	1	1.	1.	0.81	1.07	1.31	1.1	1.07	0.
time (sec)	N/A	0.067	0.02	0.004	0.77	0.268	0.136	0.265	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	73	60	80	105	83	80	71
normalized size	1	1.	1.	0.82	1.1	1.44	1.14	1.1	0.97
time (sec)	N/A	0.115	0.066	0.005	0.772	0.27	0.32	0.265	27.302

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	94	77	105	194	102	105	90
normalized size	1	1.	1.	0.82	1.12	2.06	1.09	1.12	0.96
time (sec)	N/A	0.186	0.16	0.008	0.77	0.273	0.427	0.266	50.34

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	104	89	132	275	119	119	105
normalized size	1	1.	0.9	0.77	1.15	2.39	1.03	1.03	0.91
time (sec)	N/A	0.271	0.286	0.01	0.77	0.275	0.507	0.267	74.262

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	91	71	97	144	88	97	0
normalized size	1	1.	1.	0.78	1.07	1.58	0.97	1.07	0.
time (sec)	N/A	0.142	0.108	0.011	0.779	0.266	0.228	0.265	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	61	84	131	75	84	0
normalized size	1	1.	1.	0.79	1.09	1.7	0.97	1.09	0.
time (sec)	N/A	0.125	0.052	0.009	0.771	0.265	0.22	0.266	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	51	70	116	61	70	0
normalized size	1	1.	1.	0.81	1.11	1.84	0.97	1.11	0.
time (sec)	N/A	0.11	0.059	0.009	0.77	0.261	0.209	0.265	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	34	49	69	41	49	37
normalized size	1	1.	1.	0.79	1.14	1.6	0.95	1.14	0.86
time (sec)	N/A	0.049	0.03	0.007	0.765	0.258	0.17	0.265	9.561

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	94	77	105	194	102	105	90
normalized size	1	1.	1.	0.82	1.12	2.06	1.09	1.12	0.96
time (sec)	N/A	0.193	0.11	0.008	0.773	0.278	0.413	0.264	50.449

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	106	94	130	262	122	130	116
normalized size	1	1.	0.83	0.74	1.02	2.06	0.96	1.02	0.91
time (sec)	N/A	0.279	0.101	0.013	0.771	0.272	0.493	0.266	75.791

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	136	106	159	356	143	149	143
normalized size	1	1.	0.92	0.72	1.07	2.41	0.97	1.01	0.97
time (sec)	N/A	0.365	0.128	0.013	0.767	0.275	0.579	0.266	106.206

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	98	73	111	185	95	97	0
normalized size	1	1.	1.	0.74	1.13	1.89	0.97	0.99	0.
time (sec)	N/A	0.173	0.071	0.012	0.774	0.264	0.285	0.266	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	84	63	97	170	82	84	0
normalized size	1	1.	1.	0.75	1.15	2.02	0.98	1.	0.
time (sec)	N/A	0.15	0.07	0.01	0.769	0.266	0.282	0.266	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	51	47	76	109	61	62	71
normalized size	1	1.	0.8	0.73	1.19	1.7	0.95	0.97	1.11
time (sec)	N/A	0.096	0.061	0.008	0.769	0.266	0.244	0.264	45.731

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	51	47	76	108	61	62	54
normalized size	1	1.	0.8	0.73	1.19	1.69	0.95	0.97	0.84
time (sec)	N/A	0.065	0.053	0.008	0.763	0.263	0.233	0.262	10.737

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	99	89	132	275	122	119	107
normalized size	1	1.	0.86	0.77	1.15	2.39	1.06	1.03	0.93
time (sec)	N/A	0.281	0.338	0.01	0.767	0.272	0.486	0.265	77.854

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	136	106	157	343	143	149	134
normalized size	1	1.	0.85	0.66	0.98	2.14	0.89	0.93	0.84
time (sec)	N/A	0.366	0.204	0.013	0.765	0.272	0.596	0.267	101.504

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	151	118	186	437	163	157	172
normalized size	1	1.	0.83	0.65	1.03	2.41	0.9	0.87	0.95
time (sec)	N/A	0.454	0.164	0.014	0.768	0.28	0.699	0.268	126.545

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	85	166	239	143	0	126	192
normalized size	1	1.	0.41	0.8	1.15	0.69	0.	0.61	0.92
time (sec)	N/A	0.484	0.113	0.039	0.795	0.284	0.	0.27	102.482

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	75	132	193	130	0	112	153
normalized size	1	1.	0.45	0.8	1.16	0.78	0.	0.67	0.92
time (sec)	N/A	0.311	0.09	0.01	0.778	0.282	0.	0.27	68.403

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	65	98	147	116	0	99	105
normalized size	1	1.	0.52	0.79	1.19	0.94	0.	0.8	0.85
time (sec)	N/A	0.175	0.079	0.009	0.77	0.278	0.	0.271	23.165

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	55	64	101	103	0	85	73
normalized size	1	1.	0.67	0.78	1.23	1.26	0.	1.04	0.89
time (sec)	N/A	0.085	0.051	0.008	0.772	0.278	0.	0.27	10.173

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	1133	2065	0	1397	0	0	204
normalized size	1	1.	6.51	11.87	0.	8.03	0.	0.	1.17
time (sec)	N/A	0.862	6.412	0.187	0.	0.337	0.	0.	75.479

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	1148	16357	0	1465	0	0	219
normalized size	1	1.	6.11	87.01	0.	7.79	0.	0.	1.16
time (sec)	N/A	0.808	6.547	0.248	0.	0.354	0.	0.	80.306

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	1170	43932	0	1646	0	0	252
normalized size	1	1.	5.25	197.	0.	7.38	0.	0.	1.13
time (sec)	N/A	0.971	6.474	0.401	0.	0.374	0.	0.	104.314

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	95	185	278	157	0	139	226
normalized size	1	1.	0.41	0.8	1.2	0.68	0.	0.6	0.98
time (sec)	N/A	0.539	0.132	0.046	0.779	0.286	0.	0.271	127.504

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	85	151	232	143	0	126	201
normalized size	1	1.	0.45	0.8	1.23	0.76	0.	0.67	1.06
time (sec)	N/A	0.314	0.11	0.01	0.77	0.287	0.	0.269	96.967

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	75	117	186	130	0	112	126
normalized size	1	1.	0.51	0.8	1.27	0.88	0.	0.76	0.86
time (sec)	N/A	0.198	0.092	0.009	0.775	0.282	0.	0.27	24.137

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	65	83	140	116	0	99	94
normalized size	1	1.	0.62	0.79	1.33	1.1	0.	0.94	0.9
time (sec)	N/A	0.104	0.072	0.007	0.768	0.279	0.	0.269	11.09

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	197	197	1175	3460	0	1486	0	0	226
normalized size	1	1.	5.96	17.56	0.	7.54	0.	0.	1.15
time (sec)	N/A	1.008	6.454	0.058	0.	0.347	0.	0.	101.444

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	1180	28185	0	1548	0	0	255
normalized size	1	1.	5.09	121.49	0.	6.67	0.	0.	1.1
time (sec)	N/A	1.164	6.469	0.182	0.	0.372	0.	0.	127.233

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	1171	81415	0	1601	0	0	284
normalized size	1	1.	5.25	365.09	0.	7.18	0.	0.	1.27
time (sec)	N/A	0.911	6.575	0.373	0.	0.367	0.	0.	92.946

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	254	254	105	204	317	170	0	153	246
normalized size	1	1.	0.41	0.8	1.25	0.67	0.	0.6	0.97
time (sec)	N/A	0.604	0.153	0.054	0.8	0.293	0.	0.274	128.005

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	95	170	271	157	0	139	221
normalized size	1	1.	0.45	0.8	1.28	0.74	0.	0.66	1.04
time (sec)	N/A	0.369	0.126	0.01	0.79	0.286	0.	0.273	96.831

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	85	136	225	143	0	126	146
normalized size	1	1.	0.5	0.8	1.32	0.84	0.	0.74	0.86
time (sec)	N/A	0.233	0.111	0.01	0.783	0.278	0.	0.27	25.215

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	75	102	180	130	0	112	114
normalized size	1	1.	0.59	0.8	1.41	1.02	0.	0.88	0.89
time (sec)	N/A	0.124	0.087	0.008	0.794	0.283	0.	0.273	11.886

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	1189	4860	0	1519	0	0	250
normalized size	1	1.	5.36	21.89	0.	6.84	0.	0.	1.13
time (sec)	N/A	1.113	6.459	0.064	0.	0.417	0.	0.	129.99

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	1196	40028	0	1621	0	0	270
normalized size	1	1.	4.69	156.97	0.	6.36	0.	0.	1.06
time (sec)	N/A	1.385	6.481	0.185	0.	0.384	0.	0.	152.489

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	1203	119321	0	1773	0	0	284
normalized size	1	1.	4.28	424.63	0.	6.31	0.	0.	1.01
time (sec)	N/A	1.385	6.509	0.42	0.	0.48	0.	0.	155.682

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	75	147	200	130	0	112	153
normalized size	1	1.	0.41	0.79	1.08	0.7	0.	0.61	0.83
time (sec)	N/A	0.513	0.113	0.025	0.784	0.285	0.	0.277	71.679

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	65	113	154	116	0	99	124
normalized size	1	1.	0.45	0.79	1.08	0.81	0.	0.69	0.87
time (sec)	N/A	0.287	0.086	0.009	0.791	0.281	0.	0.275	45.547

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	55	79	108	103	0	85	85
normalized size	1	1.	0.54	0.78	1.07	1.02	0.	0.84	0.84
time (sec)	N/A	0.16	0.063	0.01	0.778	0.275	0.	0.274	22.385

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	46	45	62	89	0	72	53
normalized size	1	1.	0.78	0.76	1.05	1.51	0.	1.22	0.9
time (sec)	N/A	0.073	0.05	0.007	0.784	0.282	0.	0.272	9.67

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	959	684	0	1299	0	0	172
normalized size	1	1.	6.48	4.62	0.	8.78	0.	0.	1.16
time (sec)	N/A	0.627	6.413	0.006	0.	0.33	0.	0.	55.024

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	1147	5225	0	1505	0	0	216
normalized size	1	1.	6.1	27.79	0.	8.01	0.	0.	1.15
time (sec)	N/A	0.885	6.449	0.009	0.	0.362	0.	0.	77.524

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	1170	13040	0	1601	0	0	258
normalized size	1	1.	5.25	58.48	0.	7.18	0.	0.	1.16
time (sec)	N/A	0.969	6.467	0.037	0.	0.372	0.	0.	104.21

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	95	166	200	159	0	111	175
normalized size	1	1.	0.57	1.	1.2	0.96	0.	0.67	1.05
time (sec)	N/A	0.335	0.095	0.036	0.782	0.29	0.	0.273	97.021

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	65	132	154	146	0	97	144
normalized size	1	1.	0.52	1.06	1.24	1.18	0.	0.78	1.16
time (sec)	N/A	0.218	0.097	0.01	0.78	0.285	0.	0.273	72.126

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	55	98	108	132	0	84	112
normalized size	1	1.	0.67	1.2	1.32	1.61	0.	1.02	1.37
time (sec)	N/A	0.127	0.079	0.009	0.782	0.28	0.	0.272	46.323

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	64	62	119	0	72	51
normalized size	1	1.	1.	1.42	1.38	2.64	0.	1.6	1.13
time (sec)	N/A	0.054	0.052	0.007	0.781	0.278	0.	0.272	9.599

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	1129	718	0	1463	0	0	207
normalized size	1	1.	6.41	4.08	0.	8.31	0.	0.	1.18
time (sec)	N/A	0.833	6.394	0.037	0.	0.333	0.	0.	79.311

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	1170	5942	0	1588	0	0	248
normalized size	1	1.	5.55	28.16	0.	7.53	0.	0.	1.18
time (sec)	N/A	0.975	6.453	0.096	0.	0.373	0.	0.	99.989

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	1191	18844	0	1777	0	0	286
normalized size	1	1.	4.84	76.6	0.	7.22	0.	0.	1.16
time (sec)	N/A	1.083	6.501	0.195	0.	0.384	0.	0.	130.217

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	75	214	342	186	0	109	180
normalized size	1	1.	0.51	1.46	2.33	1.27	0.	0.74	1.22
time (sec)	N/A	0.278	0.155	0.043	0.792	0.291	0.	0.274	98.319

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	65	180	296	173	0	97	144
normalized size	1	1.	0.62	1.71	2.82	1.65	0.	0.92	1.37
time (sec)	N/A	0.176	0.12	0.01	0.78	0.288	0.	0.274	72.99

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	55	146	250	159	0	82	114
normalized size	1	1.	0.81	2.15	3.68	2.34	0.	1.21	1.68
time (sec)	N/A	0.101	0.104	0.009	0.779	0.281	0.	0.274	44.887

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	33	30	80	69	0	39	37
normalized size	1	1.	0.7	0.64	1.7	1.47	0.	0.83	0.79
time (sec)	N/A	0.041	0.029	0.005	0.7	0.275	0.	0.27	9.367

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	1176	751	0	1601	0	0	238
normalized size	1	1.	5.91	3.77	0.	8.05	0.	0.	1.2
time (sec)	N/A	0.942	6.43	0.04	0.	0.359	0.	0.	105.101

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	1191	5975	0	1763	0	0	274
normalized size	1	1.	5.09	25.53	0.	7.53	0.	0.	1.17
time (sec)	N/A	1.097	6.454	0.097	0.	0.365	0.	0.	130.288

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	1218	18877	0	1871	0	0	308
normalized size	1	1.	4.53	70.17	0.	6.96	0.	0.	1.14
time (sec)	N/A	1.232	6.484	0.203	0.	0.396	0.	0.	152.126

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	436	436	456	1429	0	1	0	861	0
normalized size	1	1.	1.05	3.28	0.	0.	0.	1.97	0.
time (sec)	N/A	1.497	1.194	0.027	0.	0.564	0.	0.28	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	171	453	0	1	0	286	160
normalized size	1	1.	0.98	2.59	0.	0.01	0.	1.63	0.91
time (sec)	N/A	0.338	0.296	0.009	0.	0.307	0.	0.278	20.416

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	431	431	699	6019	0	0	0	0	420
normalized size	1	1.	1.62	13.97	0.	0.	0.	0.	0.97
time (sec)	N/A	2.379	5.283	0.091	0.	0.	0.	0.	157.729

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F(-1)	A	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	488	488	798	22287	0	0	0	4	0
normalized size	1	1.	1.64	45.67	0.	0.	0.	0.01	0.
time (sec)	N/A	7.222	3.044	0.059	0.	0.	0.	0.799	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	564	564	766	2458	0	1	0	1	0
normalized size	1	1.	1.36	4.36	0.	0.	0.	0.	0.
time (sec)	N/A	2.015	3.713	0.031	0.	1.156	0.	0.284	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	290	862	0	1	0	563	223
normalized size	1	1.	1.23	3.65	0.	0.	0.	2.39	0.94
time (sec)	N/A	0.497	0.658	0.011	0.	0.374	0.	0.28	30.602

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	F(-1)	F(-1)	F(-2)	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	679	678	1934	22523	0	0	0	0	0
normalized size	1	1.	2.85	33.17	0.	0.	0.	0.	0.
time (sec)	N/A	18.25	6.264	0.045	0.	0.	0.	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F(-2)	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	704	704	1844	72576	0	0	0	0	0
normalized size	1	1.	2.62	103.09	0.	0.	0.	0.	0.
time (sec)	N/A	22.408	6.465	0.069	0.	0.	0.	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	A	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	671	669	1621	178044	0	0	0	4	0
normalized size	1	1.	2.42	265.34	0.	0.	0.	0.01	0.
time (sec)	N/A	17.629	6.666	0.121	0.	0.	0.	0.743	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	717	717	615	1930	0	1	0	1112	0
normalized size	1	1.	0.86	2.69	0.	0.	0.	1.55	0.
time (sec)	N/A	6.354	1.261	0.033	0.	1.453	0.	0.293	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	316	316	251	706	0	1	0	410	0
normalized size	1	1.	0.79	2.23	0.	0.	0.	1.3	0.
time (sec)	N/A	1.19	0.443	0.019	0.	0.845	0.	0.285	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	95	185	0	1	0	132	97
normalized size	1	1.	0.82	1.59	0.	0.01	0.	1.14	0.84
time (sec)	N/A	0.215	0.147	0.009	0.	0.571	0.	0.282	15.755

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	374	374	633	761	0	15237	0	0	357
normalized size	1	1.	1.69	2.03	0.	40.74	0.	0.	0.95
time (sec)	N/A	1.369	5.146	0.037	0.	6.721	0.	0.	103.052

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	A	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	789	787	1836	3858	0	0	0	4	0
normalized size	1	1.	2.33	4.89	0.	0.	0.	0.01	0.
time (sec)	N/A	16.704	6.671	0.044	0.	0.	0.	0.738	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	649	649	745	2827	0	1	0	1	0
normalized size	1	1.	1.15	4.36	0.	0.	0.	0.	0.
time (sec)	N/A	4.14	4.233	0.037	0.	1.437	0.	0.287	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	309	288	1011	0	1	0	549	0
normalized size	1	1.	0.93	3.27	0.	0.	0.	1.78	0.
time (sec)	N/A	0.87	0.645	0.019	0.	0.954	0.	0.288	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	113	249	0	1	0	165	105
normalized size	1	1.	1.02	2.24	0.	0.01	0.	1.49	0.95
time (sec)	N/A	0.165	0.324	0.008	0.	0.576	0.	0.285	15.482

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	666	666	906	3889	0	0	0	0	0
normalized size	1	1.	1.36	5.84	0.	0.	0.	0.	0.
time (sec)	N/A	4.631	4.557	0.039	0.	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	891	891	872	4635	0	1	0	1	0
normalized size	1	1.	0.98	5.2	0.	0.	0.	0.	0.
time (sec)	N/A	5.044	4.886	0.045	0.	1.432	0.	0.288	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	444	444	387	1786	0	1	0	792	282
normalized size	1	1.	0.87	4.02	0.	0.	0.	1.78	0.64
time (sec)	N/A	0.988	1.912	0.02	0.	0.835	0.	0.29	151.808

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	147	185	0	386	0	356	131
normalized size	1	1.	1.12	1.41	0.	2.95	0.	2.72	1.
time (sec)	N/A	0.184	0.254	0.009	0.	0.663	0.	0.277	20.914

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	193	144	0	207	0	277	48
normalized size	1	1.	3.78	2.82	0.	4.06	0.	5.43	0.94
time (sec)	N/A	0.165	0.051	0.028	0.	0.283	0.	0.281	50.391

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1432	1432	670	928	0	0	0	0	0
normalized size	1	1.	0.47	0.65	0.	0.	0.	0.	0.
time (sec)	N/A	13.044	5.027	0.331	0.	0.	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	A
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	710	652	390	420	0	0	0	0	462
normalized size	1	0.92	0.55	0.59	0.	0.	0.	0.	0.65
time (sec)	N/A	1.626	1.129	0.776	0.	0.	0.	0.	85.439

2.2 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 [14] had the largest ratio of [0.4444]

Table 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	4	1.	29	0.138
2	A	2	2	1.	31	0.065
3	A	2	2	1.	27	0.074
4	A	4	4	1.	27	0.148
5	A	5	5	1.	27	0.185
6	A	6	5	1.	27	0.185
7	A	4	4	1.	31	0.129
8	A	2	2	1.	23	0.087
9	A	2	2	1.	31	0.065
10	A	2	2	1.	34	0.059
11	A	3	3	1.	22	0.136
12	A	6	5	1.	18	0.278
13	A	3	3	1.	26	0.115
14	A	16	12	1.	27	0.444
15	A	2	1	1.	23	0.043
16	A	2	1	1.	23	0.043
17	A	2	1	1.	23	0.043
18	A	2	1	1.	21	0.048
19	A	6	5	1.	23	0.217
20	A	4	4	1.	23	0.174
21	A	5	5	1.	23	0.217
22	A	2	1	1.	25	0.04
23	A	2	1	1.	25	0.04
24	A	2	1	1.	25	0.04
25	A	2	1	1.	23	0.043
26	A	6	5	1.	25	0.2
27	A	7	6	1.	25	0.24
28	A	5	4	1.	25	0.16
29	A	6	5	1.	25	0.2
30	A	2	1	1.	25	0.04
31	A	2	1	1.	25	0.04
32	A	2	1	1.	25	0.04
33	A	2	1	1.	23	0.043

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
34	A	6	5	1.	25	0.2
35	A	7	6	1.	25	0.24
36	A	8	6	1.	25	0.24
37	A	6	5	1.	25	0.2
38	A	6	5	1.	25	0.2
39	A	6	5	1.	25	0.2
40	A	6	5	1.	23	0.217
41	A	9	5	1.	25	0.2
42	A	10	6	1.	25	0.24
43	A	11	7	1.	25	0.28
44	A	7	6	1.	25	0.24
45	A	7	6	1.	25	0.24
46	A	7	6	1.	25	0.24
47	A	4	4	1.	23	0.174
48	A	10	6	1.	25	0.24
49	A	11	7	1.	25	0.28
50	A	12	7	1.	25	0.28
51	A	8	6	1.	25	0.24
52	A	8	6	1.	25	0.24
53	A	5	4	1.	25	0.16
54	A	5	5	1.	23	0.217
55	A	11	7	1.	25	0.28
56	A	12	7	1.	25	0.28
57	A	13	7	1.	25	0.28
58	A	11	5	1.	27	0.185
59	A	9	5	1.	27	0.185
60	A	7	5	1.	27	0.185
61	A	5	5	1.	25	0.2
62	A	8	7	1.	27	0.259
63	A	6	5	1.	27	0.185
64	A	7	6	1.	27	0.222
65	A	12	5	1.	27	0.185
66	A	10	5	1.	27	0.185
67	A	8	5	1.	27	0.185

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
68	A	6	5	1.	25	0.2
69	A	9	8	1.	27	0.296
70	A	10	9	1.	27	0.333
71	A	7	6	1.	27	0.222
72	A	13	5	1.	27	0.185
73	A	11	5	1.	27	0.185
74	A	9	5	1.	27	0.185
75	A	7	5	1.	25	0.2
76	A	10	9	1.	27	0.333
77	A	11	9	1.	27	0.333
78	A	11	10	1.	27	0.37
79	A	10	4	1.	27	0.148
80	A	8	4	1.	27	0.148
81	A	6	4	1.	27	0.148
82	A	4	4	1.	25	0.16
83	A	5	4	1.	27	0.148
84	A	6	5	1.	27	0.185
85	A	7	6	1.	27	0.222
86	A	9	5	1.	27	0.185
87	A	7	5	1.	27	0.185
88	A	5	5	1.	27	0.185
89	A	4	4	1.	25	0.16
90	A	6	5	1.	27	0.185
91	A	7	6	1.	27	0.222
92	A	8	6	1.	27	0.222
93	A	8	5	1.	27	0.185
94	A	6	5	1.	27	0.185
95	A	5	4	1.	27	0.148
96	A	3	3	1.	25	0.12
97	A	7	6	1.	27	0.222
98	A	8	6	1.	27	0.222
99	A	9	6	1.	27	0.222
100	A	7	5	1.	27	0.185
101	A	5	5	1.	25	0.2

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
102	A	8	5	1.	27	0.185
103	A	6	4	1.	27	0.148
104	A	8	5	1.	27	0.185
105	A	6	5	1.	25	0.2
106	A	9	6	1.	27	0.222
107	A	10	7	1.	27	0.259
108	A	7	5	1.	27	0.185
109	A	8	4	1.	27	0.148
110	A	6	4	1.	27	0.148
111	A	4	4	1.	25	0.16
112	A	5	3	1.	27	0.111
113	A	6	4	1.	27	0.148
114	A	7	5	1.	27	0.185
115	A	5	5	1.	27	0.185
116	A	4	4	1.	25	0.16
117	A	6	4	1.	27	0.148
118	A	6	5	1.	27	0.185
119	A	5	4	1.	27	0.148
120	A	3	3	1.	25	0.12
121	A	5	4	1.	27	0.148
122	A	3	3	1.	29	0.103
123	A	3	3	0.92	29	0.103

3 Listing of integrals

$$3.1 \quad \int \frac{a+bx+\frac{bf^2x^2}{e}}{\sqrt{d+ex+fx^2}} dx$$

Optimal. Leaf size=102

$$\frac{\left(8af - b\left(\frac{4df}{e} + e\right)\right) \tanh^{-1}\left(\frac{e+2fx}{2\sqrt{f}\sqrt{d+ex+fx^2}}\right)}{8f^{3/2}} + \frac{bx\sqrt{d+ex+fx^2}}{2e} + \frac{b\sqrt{d+ex+fx^2}}{4f}$$

[Out] (b*Sqrt[d + e*x + f*x^2])/(4*f) + (b*x*Sqrt[d + e*x + f*x^2])/(2*e) + ((8*a*f - b*(e + (4*d*f)/e))*ArcTanh[(e + 2*f*x)/(2*Sqrt[f]*Sqrt[d + e*x + f*x^2])])/(8*f^(3/2))

Rubi [A] time = 0.222452, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$

$$\frac{\left(8af - b\left(\frac{4df}{e} + e\right)\right) \tanh^{-1}\left(\frac{e+2fx}{2\sqrt{f}\sqrt{d+ex+fx^2}}\right)}{8f^{3/2}} + \frac{bx\sqrt{d+ex+fx^2}}{2e} + \frac{b\sqrt{d+ex+fx^2}}{4f}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + (b*f*x^2)/e)/Sqrt[d + e*x + f*x^2], x]

[Out] (b*Sqrt[d + e*x + f*x^2])/(4*f) + (b*x*Sqrt[d + e*x + f*x^2])/(2*e) + ((8*a*f - b*(e + (4*d*f)/e))*ArcTanh[(e + 2*f*x)/(2*Sqrt[f]*Sqrt[d + e*x + f*x^2])])/(8*f^(3/2))

Rubi in Sympy [A] time = 21.5069, size = 82, normalized size = 0.8

$$\frac{b\left(\frac{e}{2} + fx\right)\sqrt{d+ex+fx^2}}{2ef} - \frac{(-8aef + 4bdf + be^2) \operatorname{atanh}\left(\frac{e+2fx}{2\sqrt{f}\sqrt{d+ex+fx^2}}\right)}{8ef^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2), x)

[Out] $b(e/2 + f*x)*\sqrt{d + e*x + f*x**2}/(2*e*f) - (-8*a*e*f + 4*b*d*f + b*e**2)*\operatorname{atanh}((e + 2*f*x)/(2*\sqrt{f}*\sqrt{d + e*x + f*x**2}))/ (8*e*f**(3/2))$

Mathematica [A] time = 0.242723, size = 85, normalized size = 0.83

$$\frac{(8aef - b(4df + e^2)) \log\left(2\sqrt{f}\sqrt{d + x(e + fx)} + e + 2fx\right) + 2b\sqrt{f}(e + 2fx)\sqrt{d + x(e + fx)}}{8ef^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + (b*f*x^2)/e)/Sqrt[d + e*x + f*x^2], x]

[Out] $(2*b*\operatorname{Sqrt}[f]*(e + 2*f*x)*\operatorname{Sqrt}[d + x*(e + f*x)] + (8*a*e*f - b*(e^2 + 4*d*f))*\operatorname{Log}[e + 2*f*x + 2*\operatorname{Sqrt}[f]*\operatorname{Sqrt}[d + x*(e + f*x)]])/(8*e*f^{3/2})$

Maple [A] time = 0.013, size = 136, normalized size = 1.3

$$\begin{aligned} & a \ln\left(1\left(\frac{e}{2} + fx\right) \frac{1}{\sqrt{f}} + \sqrt{fx^2 + ex + d}\right) \frac{1}{\sqrt{f}} + \frac{b}{4f} \sqrt{fx^2 + ex + d} \\ & - \frac{be}{8} \ln\left(1\left(\frac{e}{2} + fx\right) \frac{1}{\sqrt{f}} + \sqrt{fx^2 + ex + d}\right) f^{-\frac{3}{2}} + \frac{bx}{2e} \sqrt{fx^2 + ex + d} \\ & - \frac{bd}{2e} \ln\left(1\left(\frac{e}{2} + fx\right) \frac{1}{\sqrt{f}} + \sqrt{fx^2 + ex + d}\right) \frac{1}{\sqrt{f}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*x+b*f*x^2/e)/(f*x^2+e*x+d)^(1/2), x)

[Out] $a*\ln((1/2*e+f*x)/f^{1/2}+(f*x^2+e*x+d)^{1/2})/f^{1/2}+1/4*b*(f*x^2+e*x+d)^{1/2}/f-1/8*e*b/f^{3/2}*\ln((1/2*e+f*x)/f^{1/2}+(f*x^2+e*x+d)^{1/2})+1/2*b*x*(f*x^2+e*x+d)^{1/2}/e-1/2/e*b/f^{1/2}*d*\ln((1/2*e+f*x)/f^{1/2}+(f*x^2+e*x+d)^{1/2})$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*f*x^2/e + b*x + a)/sqrt(f*x^2 + e*x + d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.369598, size = 1, normalized size = 0.01

$$\left[\frac{4(2bfx + be)\sqrt{fx^2 + ex + d}\sqrt{f} - (be^2 + 4(bd - 2ae)f) \log\left(-4(2f^2x + ef)\sqrt{fx^2 + ex + d} - (8f^2x^2 + 8efx + e^2 + 4d)\sqrt{f}\right)}{16ef^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*f*x^2/e + b*x + a)/sqrt(f*x^2 + e*x + d),x, algorithm="fricas")
```

```
[Out] [1/16*(4*(2*b*f*x + b*e)*sqrt(f*x^2 + e*x + d)*sqrt(f) - (b*e^2 + 4*(b*d - 2*a*e)*f)*log(-4*(2*f^2*x + e*f)*sqrt(f*x^2 + e*x + d) - (8*f^2*x^2 + 8*e*f*x + e^2 + 4*d*f)*sqrt(f)))/(e*f^(3/2)), 1/8*(2*(2*b*f*x + b*e)*sqrt(f*x^2 + e*x + d)*sqrt(-f) - (b*e^2 + 4*(b*d - 2*a*e)*f)*arctan(1/2*(2*f*x + e)*sqrt(-f)/(sqrt(f*x^2 + e*x + d)*f)))/(e*sqrt(-f)*f)]
```

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

$$\frac{\int \frac{ae}{\sqrt{d+ex+fx^2}} dx + \int \frac{bex}{\sqrt{d+ex+fx^2}} dx + \int \frac{bf x^2}{\sqrt{d+ex+fx^2}} dx}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] (Integral(a*e/sqrt(d + e*x + f*x**2), x) + Integral(b*e*x/sqrt(d + e*x + f*x**2), x) + Integral(b*f*x**2/sqrt(d + e*x + f*x**2), x))/e
```

GIAC/XCAS [A] time = 0.284918, size = 113, normalized size = 1.11

$$\frac{1}{4} \sqrt{fx^2 + xe + d} \left(2bx e^{(-1)} + \frac{b}{f} \right) + \frac{(4bdf - 8afe + be^2) e^{(-1)} \ln \left(\left| -2 \left(\sqrt{f}x - \sqrt{fx^2 + xe + d} \right) \sqrt{f} - e \right| \right)}{8f^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((b*f*x^2/e + b*x + a)/sqrt(f*x^2 + e*x + d),x, algorithm="giac")

[Out] 1/4*sqrt(f*x^2 + x*e + d)*(2*b*x*e^(-1) + b/f) + 1/8*(4*b*d*f - 8*a*f*e + b*e^2)*e^(-1)*ln(abs(-2*(sqrt(f)*x - sqrt(f*x^2 + x*e + d))*sqrt(f) - e))/f^(3/2)

$$3.2 \quad \int \frac{1}{\sqrt{d+ex+fx^2} \left(a+bx+\frac{bf x^2}{e} \right)} dx$$

Optimal. Leaf size=82

$$\frac{2\sqrt{e} \tanh^{-1} \left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}} \right)}{\sqrt{bd-ae}\sqrt{be-4af}}$$

[Out] (-2*Sqrt[e]*ArcTanh[(Sqrt[b*d - a*e]*(e + 2*f*x))/(Sqrt[e]*Sqrt[b*e - 4*a*f]*Sqrt[d + e*x + f*x^2])])/(Sqrt[b*d - a*e]*Sqrt[b*e - 4*a*f])

Rubi [A] time = 0.243848, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$\frac{2\sqrt{e} \tanh^{-1} \left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}} \right)}{\sqrt{bd-ae}\sqrt{be-4af}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[d + e*x + f*x^2]*(a + b*x + (b*f*x^2)/e)),x]

[Out] (-2*Sqrt[e]*ArcTanh[(Sqrt[b*d - a*e]*(e + 2*f*x))/(Sqrt[e]*Sqrt[b*e - 4*a*f]*Sqrt[d + e*x + f*x^2])])/(Sqrt[b*d - a*e]*Sqrt[b*e - 4*a*f])

Rubi in Sympy [A] time = 25.0735, size = 76, normalized size = 0.93

$$\frac{2\sqrt{e} \operatorname{atanh} \left(\frac{(e+2fx)\sqrt{ae-bd}}{\sqrt{e}\sqrt{4af-be}\sqrt{d+ex+fx^2}} \right)}{\sqrt{ae-bd}\sqrt{4af-be}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)

[Out] 2*sqrt(e)*atanh((e + 2*f*x)*sqrt(a*e - b*d)/(sqrt(e)*sqrt(4*a*f - b*e)*sqrt(d + e*x + f*x**2)))/(sqrt(a*e - b*d)*sqrt(4*a*f - b*e))

Mathematica [B] time = 0.678144, size = 304, normalized size = 3.71

$$\sqrt{e} \left(-\log \left(\sqrt{b} \sqrt{e} (e^2 - 4df) \sqrt{be - 4af} - 4\sqrt{e} f \sqrt{bd - ae} \sqrt{be - 4af} \sqrt{d + x(e + fx)} + 4aef(e + 2fx) - be^2(e + 2fx) \right) + \log \left(\sqrt{b} \sqrt{e} (e^2 - 4df) \sqrt{be - 4af} + 4\sqrt{e} f \sqrt{bd - ae} \sqrt{be - 4af} \sqrt{d + x(e + fx)} + 4aef(e + 2fx) - be^2(e + 2fx) \right) \right)$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[d + e*x + f*x^2]*(a + b*x + (b*f*x^2)/e)),x]

[Out] (Sqrt[e]*(-Log[b*e + Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f] + 2*b*f*x] + Log[-(Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]) + b*(e + 2*f*x)] - Log[Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]*(e^2 - 4*d*f) - b*e^2*(e + 2*f*x) + 4*a*e*f*(e + 2*f*x) - 4*Sqrt[e]*Sqrt[b*d - a*e]*f*Sqrt[b*e - 4*a*f]*Sqrt[d + x*(e + f*x)]] + Log[Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]*(e^2 - 4*d*f) + b*e^2*(e + 2*f*x) - 4*(a*e*f*(e + 2*f*x) + Sqrt[e]*Sqrt[b*d - a*e]*f*Sqrt[b*e - 4*a*f]*Sqrt[d + x*(e + f*x)]]))/(Sqrt[b*d - a*e]*Sqrt[b*e - 4*a*f])

Maple [B] time = 0.062, size = 491, normalized size = 6.

$$-e \ln \left(1 \left(-2 \frac{ae - bd}{b} + \frac{1}{b} \sqrt{-be(4fa - be)} \left(x - \frac{1}{2bf} (-be + \sqrt{-be(4fa - be)}) \right) \right) + 2 \sqrt{-\frac{ae - bd}{b}} \sqrt{\left(x - \frac{1}{2} \frac{-be + \sqrt{-be}}{bf} \right)} \right)$$

$$+ e \ln \left(1 \left(-2 \frac{ae - bd}{b} - \frac{1}{b} \sqrt{-be(4fa - be)} \left(x + \frac{1}{2bf} (be + \sqrt{-be(4fa - be)}) \right) \right) + 2 \sqrt{-\frac{ae - bd}{b}} \sqrt{\left(x + \frac{1}{2} \frac{be + \sqrt{-be}}{bf} \right)} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(a+b*x+b*f*x^2/e)/(f*x^2+e*x+d)^(1/2),x)

[Out] -e/(-b*e*(4*a*f-b*e))^(1/2)/(-1/b*(a*e-b*d))^(1/2)*ln((-2/b*(a*e-b*d)+(-b*e*(4*a*f-b*e))^(1/2)/b*(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)+2*(-1/b*(a*e-b*d))^(1/2)*((x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)^2*f+(-b*e*(4*a*f-b*e))^(1/2)/b*(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)-1/b*(a*e-b*d))^(1/2)/(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)+e/(-b*e*(4*a*f-b*e))^(1/2)/(-1/b*(a*e-b*d))^(1/2)*ln((-2/b*(a*e-b*d)-(-b*e*(4*a*f-b*e))^(1/2)/b*(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)+2*(-1/b*(a*e-b*d))^(1/2)*((x+1/2*(b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)^2*f-(-b*e*(4*a*f-b*e))^(1/2)/b*(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)-1/b*(a*e-b*d))^(1/2)/(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^(1/2)))/b/f)

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((b*f*x^2/e + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 0.45648, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((b*f*x^2/e + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="fricas")

[Out] [1/2*sqrt(e/(b^2*d*e - a*b*e^2 - 4*(a*b*d - a^2*e)*f))*log((8*b^2*d^2*e^4 - 8*a*b*d*e^5 + a^2*e^6 + 16*a^2*d^2*e^2*f^2 + (b^2*e^4*f^2 + 16*(b^2*d^2 - 8*a*b*d*e + 8*a^2*e^2)*f^4 + 8*(3*b^2*d*e^2 - 4*a*b*e^3)*f^3)*x^4 + 2*(b^2*e^5*f + 16*(b^2*d^2*e - 8*a*b*d*e^2 + 8*a^2*e^3)*f^3 + 8*(3*b^2*d*e^3 - 4*a*b*e^4)*f^2)*x^3 + (b^2*e^6 - 32*(3*a*b*d^2*e - 4*a^2*d*e^2)*f^3 + 16*(3*b^2*d^2*e^2 - 13*a*b*d*e^3 + 10*a^2*e^4)*f^2 + 2*(16*b^2*d^2*e^4 - 19*a*b*e^5)*f)*x^2 - 8*(4*a*b*d^2*e^3 - 3*a^2*d^2*e^4)*f + 2*(4*b^2*d^2*e^5 - 3*a*b*e^6 - 16*(3*a*b*d^2*e^2 - 4*a^2*d^2*e^3)*f^2 + 8*(2*b^2*d^2*e^3 - 5*a*b*d^2*e^4 + 2*a^2*e^5)*f)*x - 4*(2*b^3*d^2*e^4 - 3*a*b^2*d^2*e^5 + a^2*b^2*e^6 - 2*(16*(a*b^2*d^2 - 3*a^2*b*d^2*e + 2*a^3*e^2)*f^4 - 4*(b^3*d^2*e - 4*a*b^2*d^2*e^2 + 3*a^2*b^2*e^3)*f^3 - (b^3*d^2*e^3 - a*b^2*e^4)*f^2)*x^3 + 16*(a^2*b*d^2*e^2 - a^3*d^2*e^3)*f^2 - 3*(16*(a*b^2*d^2*e - 3*a^2*b*d^2*e^2 + 2*a^3*e^3)*f^3 - 4*(b^3*d^2*e^2 - 4*a*b^2*d^2*e^3 + 3*a^2*b^2*e^4)*f^2 - (b^3*d^2*e^4 - a*b^2*e^5)*f)*x^2 - 4*(3*a*b^2*d^2*e^3 - 4*a^2*b*d^2*e^4 + a^3*e^5)*f + (b^3*d^2*e^5 - a*b^2*e^6 + 32*(a^2*b*d^2*e - a^3*d^2*e^2)*f^3 - 40*(a*b^2*d^2*e^2 - 2*a^2*b*d^2*e^3 + a^3*e^4)*f^2 + 2*(4*b^3*d^2*e^3 - 11*a*b^2*d^2*e^4 + 7*a^2*b^2*e^5)*f)*x)*sqrt(f*x^2 + e*x + d)*sqrt(e/(b^2*d*e - a*b*e^2 - 4*(a*b*d - a^2*e)*f))/(b^2*f^2*x^4 + 2*b^2*e*f*x^3 + 2*a*b*e^2*x + a^2*e^2 + (b^2*e^2 + 2*a*b*e*f)*x^2)), sqrt(-e/(b^2*d*e - a*b*e^2 - 4*(a*b*d - a^2*e)*f))*arctan(-1/2*(2*b*d^2*e^2 - a*e^3 - 4*a*d^2*e*f + (b^2*e^2*f + 4*(b*d - 2*a*e)*f^2)*x^2 + (b^2*e^3 + 4*(b*d^2*e - 2*a^2*e^2)*f)*x)/((b^2*d^2*e^2 - a*b^2*e^3 - 4*(a*b*d^2*e - a^2*e^2)*f - 2*(4*(a*b*d - a^2*e)*f^2 - (b^2*d^2*e - a*b^2*e^2)*f)*x)*sqrt(f*x^2 + e*x + d)*sqrt(-e/(b^2*d^2*e - a*b^2*e^2 - 4*(a*b*d - a^2*e)*f)))]

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

$$e \int \frac{1}{ae\sqrt{d+ex+fx^2} + bex\sqrt{d+ex+fx^2} + bfx^2\sqrt{d+ex+fx^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)

[Out] e*Integral(1/(a*e*sqrt(d + e*x + f*x**2) + b*e*x*sqrt(d + e*x + f*x**2) + b*f*x**2*sqrt(d + e*x + f*x**2)), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((b*f*x^2/e + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="giac")

[Out] Exception raised: RuntimeError

$$3.3 \quad \int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)} dx$$

Optimal. Leaf size=66

$$\frac{2 \tanh^{-1} \left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}} \right)}{\sqrt{a-d}\sqrt{b^2-4cd}}$$

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

Rubi [A] time = 0.16826, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.074$

$$\frac{2 \tanh^{-1} \left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}} \right)}{\sqrt{a-d}\sqrt{b^2-4cd}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)), x]

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

Rubi in Sympy [A] time = 20.1515, size = 61, normalized size = 0.92

$$\frac{2 \operatorname{atanh} \left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}} \right)}{\sqrt{a-d}\sqrt{b^2-4cd}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(c*x**2+b*x+d)/(c*x**2+b*x+a)**(1/2), x)

[Out] -2*atanh(sqrt(a - d)*(b + 2*c*x)/(sqrt(b**2 - 4*c*d)*sqrt(a + b*x + c*x**2)))/(sqrt(a - d)*sqrt(b**2 - 4*c*d))

Mathematica [B] time = 0.472859, size = 249, normalized size = 3.77

$$-\log\left(4c\left(-\sqrt{a-d}\sqrt{b^2-4cd}\sqrt{a+x(b+cx)}+a\left(-\sqrt{b^2-4cd}\right)+2cdx\right)-b^3+b^2\left(\sqrt{b^2-4cd}-2cx\right)+4bcd\right)+\log\left(-4c\left(\sqrt{a-d}\sqrt{b^2-4cd}\sqrt{a+x(b+cx)}+a\left(\sqrt{b^2-4cd}\right)+2cdx\right)+b^3-b^2\left(\sqrt{b^2-4cd}+2cx\right)+4bcd\right)\right)$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)),x]

[Out] (Log[b - Sqrt[b^2 - 4*c*d] + 2*c*x] - Log[b + Sqrt[b^2 - 4*c*d] + 2*c*x] - Log[-b^3 + 4*b*c*d + b^2*(Sqrt[b^2 - 4*c*d] - 2*c*x) + 4*c*(-(a*Sqrt[b^2 - 4*c*d]) + 2*c*d*x - Sqrt[a - d]*Sqrt[b^2 - 4*c*d]*Sqrt[a + x*(b + c*x)])] + Log[b^3 - 4*b*c*d + b^2*(Sqrt[b^2 - 4*c*d] + 2*c*x) - 4*c*(a*Sqrt[b^2 - 4*c*d] + 2*c*d*x + Sqrt[a - d]*Sqrt[b^2 - 4*c*d]*Sqrt[a + x*(b + c*x)])])/(Sqrt[a - d]*Sqrt[b^2 - 4*c*d])

Maple [B] time = 0.038, size = 307, normalized size = 4.7

$$-1 \ln\left(1\left(2a - 2d + \sqrt{b^2 - 4cd}\left(x - \frac{1}{2c}(-b + \sqrt{b^2 - 4cd})\right) + 2\sqrt{a-d}\sqrt{\left(x - 1/2\frac{-b + \sqrt{b^2 - 4cd}}{c}\right)^2 c + \sqrt{b^2 - 4cd}\left(x - 1/2\frac{-b + \sqrt{b^2 - 4cd}}{c}\right)}\right)\right) + 1 \ln\left(1\left(2a - 2d - \sqrt{b^2 - 4cd}\left(x + \frac{1}{2c}(b + \sqrt{b^2 - 4cd})\right) + 2\sqrt{a-d}\sqrt{\left(x + 1/2\frac{b + \sqrt{b^2 - 4cd}}{c}\right)^2 c - \sqrt{b^2 - 4cd}\left(x + 1/2\frac{b + \sqrt{b^2 - 4cd}}{c}\right)}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.358473, size = 1, normalized size = 0.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/2*log(((8*a^2*b^4 + (b^4*c^2 + 24*a*b^2*c^3 + 16*a^2*c^4 + 128
*c^4*d^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 + 2*(b^5*c + 24*a*b^3*c^2
+ 16*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*c^2 + 4*a*b*c^3)*d)*x^
3 + (b^4 + 24*a*b^2*c + 16*a^2*c^2)*d^2 + (b^6 + 32*a*b^4*c + 48*
a^2*b^2*c^2 + 32*(5*b^2*c^2 + 4*a*c^3)*d^2 - 2*(19*b^4*c + 104*a*
b^2*c^2 + 48*a^2*c^3)*d)*x^2 - 8*(a*b^4 + 4*a^2*b^2*c)*d + 2*(4*a
*b^5 + 16*a^2*b^3*c + 16*(b^3*c + 4*a*b*c^2)*d^2 - (3*b^5 + 40*a*
b^3*c + 48*a^2*b*c^2)*d)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*
d) - 4*(2*a^2*b^5 - 4*(b^3*c + 4*a*b*c^2)*d^3 + 2*(a*b^4*c^2 + 4*
a^2*b^2*c^3 - 32*c^4*d^3 + 12*(b^2*c^3 + 4*a*c^4)*d^2 - (b^4*c^2
+ 16*a*b^2*c^3 + 16*a^2*c^4)*d)*x^3 + (b^5 + 16*a*b^3*c + 16*a^2*
b*c^2)*d^2 + 3*(a*b^5*c + 4*a^2*b^3*c^2 - 32*b*c^3*d^3 + 12*(b^3*
c^2 + 4*a*b*c^3)*d^2 - (b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d)*x
^2 - 3*(a*b^5 + 4*a^2*b^3*c)*d + (a*b^6 + 8*a^2*b^4*c - 8*(5*b^2*
c^2 + 4*a*c^3)*d^3 + 2*(7*b^4*c + 40*a*b^2*c^2 + 16*a^2*c^3)*d^2
- (b^6 + 22*a*b^4*c + 40*a^2*b^2*c^2)*d)*x)*sqrt(c*x^2 + b*x + a)
)/(c^2*x^4 + 2*b*c*x^3 + 2*b*d*x + (b^2 + 2*c*d)*x^2 + d^2))/sqrt
(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d), arctan(-1/2*(2*a*b^2 + (b^2*
c + 4*a*c^2 - 8*c^2*d)*x^2 - (b^2 + 4*a*c)*d + (b^3 + 4*a*b*c - 8
*b*c*d)*x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)/((a*b^3 + 4*b
*c*d^2 - (b^3 + 4*a*b*c)*d + 2*(a*b^2*c + 4*c^2*d^2 - (b^2*c + 4*
a*c^2)*d)*x)*sqrt(c*x^2 + b*x + a))/sqrt(-a*b^2 - 4*c*d^2 + (b^2
+ 4*a*c)*d)]
```

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

$$\int \frac{1}{\sqrt{a+bx+cx^2}(bx+cx^2+d)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(c*x**2+b*x+d)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*x + c*x**2)*(b*x + c*x**2 + d)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.4 \quad \int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)^2} dx$$

Optimal. Leaf size=129

$$\frac{(4c(a-2d)+b^2) \tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{(a-d)^{3/2}(b^2-4cd)^{3/2}} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{(a-d)(b^2-4cd)(bx+cx^2+d)}$$

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

Rubi [A] time = 0.397961, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{(4c(a-2d)+b^2) \tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{(a-d)^{3/2}(b^2-4cd)^{3/2}} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{(a-d)(b^2-4cd)(bx+cx^2+d)}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^2), x]

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

Rubi in Sympy [A] time = 73.1812, size = 114, normalized size = 0.88

$$-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{(a-d)(b^2-4cd)(bx+cx^2+d)} + \frac{(4ac+b^2-8cd) \operatorname{atanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{(a-d)^{\frac{3}{2}}(b^2-4cd)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(c*x**2+b*x+d)**2/(c*x**2+b*x+a)**(1/2), x)

[Out] -(b + 2*c*x)*sqrt(a + b*x + c*x**2)/((a - d)*(b**2 - 4*c*d)*(b*x + c*x**2 + d)) + (4*a*c + b**2 - 8*c*d)*atanh(sqrt(a - d)*(b + 2*c*x)/(sqrt(b**2 - 4*c*d)*sqrt(a + b*x + c*x**2)))/((a - d)**(3/2))

$(b^2 - 4cd)^{3/2}$

Mathematica [B] time = 0.552985, size = 339, normalized size = 2.63

$$-2\sqrt{a-d}\sqrt{b^2-4cd}(b+2cx)\sqrt{a+x(b+cx)} - (4c(a-2d)+b^2)(x(b+cx)+d)\log\left(-\sqrt{b^2-4cd}+b+2cx\right) + (4c(a-2d)+$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^2), x]

[Out] $(-2\sqrt{a-d}\sqrt{b^2-4cd}(b+2cx)\sqrt{a+x(b+cx)}) - (b^2+4c(a-2d))(d+x(b+cx))\log[b-\sqrt{b^2-4cd}+2cx] + (b^2+4c(a-2d))(d+x(b+cx))\log[b+\sqrt{b^2-4cd}+2cx] - (b^2+4c(a-2d))(d+x(b+cx))\log[b^2+b\sqrt{b^2-4cd}+2c(-2a+\sqrt{b^2-4cd})x-2\sqrt{a-d}\sqrt{a+x(b+cx)}] + (b^2+4c(a-2d))(d+x(b+cx))\log[-b^2+b\sqrt{b^2-4cd}+2c(2a+\sqrt{b^2-4cd})x+2\sqrt{a-d}\sqrt{a+x(b+cx)}])/(2(a-d)^{3/2}(b^2-4cd)^{3/2}(d+x(b+cx))$

Maple [B] time = 0.039, size = 829, normalized size = 6.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] $-1/(b^2-4cd)/(a-d)/(x+1/2b/c-1/2/c\sqrt{b^2-4cd})^{1/2}((x-1/2(-b+(b^2-4cd)^{1/2})/c)^{2c+(b^2-4cd)^{1/2}}(x-1/2(-b+(b^2-4cd)^{1/2})/c)+a-d)^{1/2}+1/2/(b^2-4cd)^{1/2}/(a-d)^{3/2}\ln((2a-2d+(b^2-4cd)^{1/2})(x-1/2(-b+(b^2-4cd)^{1/2})/c)+2(a-d)^{1/2})^{((x-1/2(-b+(b^2-4cd)^{1/2})/c)^{2c+(b^2-4cd)^{1/2}}(x-1/2(-b+(b^2-4cd)^{1/2})/c)+a-d)^{1/2})/(x-1/2(-b+(b^2-4cd)^{1/2})/c)+2/(b^2-4cd)^{3/2}c/(a-d)^{1/2}\ln((2a-2d+(b^2-4cd)^{1/2})(x-1/2(-b+(b^2-4cd)^{1/2})/c)+2(a-d)^{1/2})^{((x-1/2(-b+(b^2-4cd)^{1/2})/c)^{2c+(b^2-4cd)^{1/2}}(x-1/2(-b+(b^2-4cd)^{1/2})/c)+a-d)^{1/2})/(x-1/2(-b+(b^2-4cd)^{1/2})/c))-1/(b^2-4cd)/(a-d)/(x+1/2b/c+1/2/c\sqrt{b^2-4cd})^{1/2}((x+1/2(b+(b^2-4cd)^{1/2})/c)^{2c-(b^2-4cd)^{1/2}}(x+1/2(b+(b^2-4cd)^{1/2})/c)+a-d)^{1/2}-1/2/(b^2-4cd)^{1/2}/(a-d)^{3/2}\ln((2a-2d-(b^2-4cd)^{1/2})(x+1/2(b+(b^2-4cd)^{1/2})/c)+2(a-d)^{1/2})^{((x+1/2(b+(b^2-4cd)^{1/2})/c)^{2c-(b^2-4cd)^{1/2}}(x+1/2$

$$\frac{(b+(b^2-4cd)^{1/2})/c+a-d)^{1/2}}{(x+1/2(b+(b^2-4cd)^{1/2})/c)} - \frac{2(b^2-4cd)^{3/2}c/(a-d)^{1/2} \ln((2a-2d-(b^2-4cd)^{1/2})^{1/2}(x+1/2(b+(b^2-4cd)^{1/2})/c)+2(a-d)^{1/2}((x+1/2(b+(b^2-4cd)^{1/2})/c)^2c-(b^2-4cd)^{1/2}(x+1/2(b+(b^2-4cd)^{1/2})/c)+a-d)^{1/2})}{(x+1/2(b+(b^2-4cd)^{1/2})/c)}$$

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(cx^2 + bx + d)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2), x, algorithm="maxima")

[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2), x)

Fricas [A] time = 0.590916, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] [-1/4*(4*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d)*sqrt(c*x^2 + b*x + a)*(2*c*x + b) - (8*c*d^2 - (b^2*c + 4*a*c^2 - 8*c^2*d)*x^2 - (b^2 + 4*a*c)*d - (b^3 + 4*a*b*c - 8*b*c*d)*x)*log(((8*a^2*b^4 + (b^4*c^2 + 24*a*b^2*c^3 + 16*a^2*c^4 + 128*c^4*d^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 + 2*(b^5*c + 24*a*b^3*c^2 + 16*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*c^2 + 4*a*b*c^3)*d)*x^3 + (b^4 + 24*a*b^2*c + 16*a^2*c^2)*d^2 + (b^6 + 32*a*b^4*c + 48*a^2*b^2*c^2 + 32*(5*b^2*c^2 + 4*a*c^3)*d^2 - 2*(19*b^4*c + 104*a*b^2*c^2 + 48*a^2*c^3)*d)*x^2 - 8*(a*b^4 + 4*a^2*b^2*c)*d + 2*(4*a*b^5 + 16*a^2*b^3*c + 16*(b^3*c + 4*a*b*c^2)*d^2 - (3*b^5 + 40*a*b^3*c + 48*a^2*b*c^2)*d)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d) - 4*(2*a^2*b^5 - 4*(b^3*c + 4*a*b*c^2)*d^3 + 2*(a*b^4*c^2 + 4*a^2*b^2*c^3 - 32*c^4*d^3 + 12*(b^2*c^3 + 4*a*c^4)*d^2 - (b^4*c^2 + 16*a*b^2*c^3 + 16*a^2*c^4)*d)*x^3 + (b^5 + 16*a*b^3*c + 16*a^2*b*c^2)*d^2 + 3*(a*b^5*c + 4*a^2*b^3*c^2 - 32*b*c^3*d^3 + 12*(b^3*c^2 + 4*a*b*c^3)*d^2 - (b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d)*x^2 - 3*(a*b^5 + 4*a^2*b^3*c)*d + (a*b^6 + 8*a^2*b^4*c - 8*(5*b^2*c^2 + 4*a*c^3)*d^3 + 2*(7*b^4*c + 40*a*b^2*c^2 + 16*a^2*c^3)*d^2 - (b^6 + 22*a*b^4*c + 40*a^2*b^2*c^2)*d)*x)*sqrt(c*x^2 + b*x + a))/(c^2*x^4 + 2*b*c*x^3 + 2*b*d*x + (b^2 + 2*c*d)*x^2 + d^2))/((a*b^2*d + 4*c*d^3 - (b^2

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

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/(c*x**2+b*x+d)**2/(c*x**2+b*x+a)**(1/2),x)

[Out] Timed out

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2),x, algorithm="giac")

[Out] Exception raised: RuntimeError

$$3.5 \quad \int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)^3} dx$$

Optimal. Leaf size=224

$$\frac{(16c^2(3a^2 - 8ad + 8d^2) + 8b^2c(a - 4d) + 3b^4) \tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{4(a-d)^{5/2}(b^2-4cd)^{5/2}} + \frac{3(b+2cx)(4c(a-2d)+b^2)\sqrt{a+bx+cx^2}}{4(a-d)^2(b^2-4cd)^2(bx+cx^2+d)} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{2(a-d)(b^2-4cd)(bx+cx^2+d)^2}$$

[Out] $-\left(\frac{(b + 2cx)\sqrt{a+bx+cx^2}}{(a-d)(b^2-4cd)^{5/2}} + \frac{3(b+2cx)(4c(a-2d)+b^2)\sqrt{a+bx+cx^2}}{4(a-d)^2(b^2-4cd)^2(bx+cx^2+d)} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{2(a-d)(b^2-4cd)(bx+cx^2+d)^2}\right) - \left(\frac{(3b^4 + 8b^2c(a-4d) + 16c^2(3a^2 - 8ad + 8d^2))\operatorname{ArcTanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{4(a-d)^{5/2}(b^2-4cd)^{5/2}}\right)$

Rubi [A] time = 0.971241, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{(16c^2(3a^2 - 8ad + 8d^2) + 8b^2c(a - 4d) + 3b^4) \tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{4(a-d)^{5/2}(b^2-4cd)^{5/2}} + \frac{3(b+2cx)(4c(a-2d)+b^2)\sqrt{a+bx+cx^2}}{4(a-d)^2(b^2-4cd)^2(bx+cx^2+d)} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{2(a-d)(b^2-4cd)(bx+cx^2+d)^2}$$

Antiderivative was successfully verified.

[In] $\operatorname{Int}\left[\frac{1}{(\sqrt{a+bx+cx^2})^3(d+bx+cx^2)^3}, x\right]$

[Out] $-\left(\frac{(b + 2cx)\sqrt{a+bx+cx^2}}{(a-d)(b^2-4cd)^{5/2}} + \frac{3(b+2cx)(4c(a-2d)+b^2)\sqrt{a+bx+cx^2}}{4(a-d)^2(b^2-4cd)^2(bx+cx^2+d)} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{2(a-d)(b^2-4cd)(bx+cx^2+d)^2}\right) - \left(\frac{(3b^4 + 8b^2c(a-4d) + 16c^2(3a^2 - 8ad + 8d^2))\operatorname{ArcTanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{4(a-d)^{5/2}(b^2-4cd)^{5/2}}\right)$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(c*x**2+b*x+d)**3/(c*x**2+b*x+a)**(1/2),x)`

[Out] Timed out

Mathematica [B] time = 1.11885, size = 486, normalized size = 2.17

$$(16c^2(3a^2 - 8ad + 8d^2) + 8b^2c(a - 4d) + 3b^4)(x(b + cx) + d)^2 \log\left(-\sqrt{b^2 - 4cd} + b + 2cx\right) - (16c^2(3a^2 - 8ad + 8d^2) + 8b^2c(a - 4d) + 3b^4)(x(b + cx) + d)^2 \log\left(\sqrt{b^2 - 4cd} + b + 2cx\right)$$

Antiderivative was successfully verified.

[In] `Integrate[1/(Sqrt[a + b*x + c*x^2])*(d + b*x + c*x^2)^3,x]`

[Out]
$$\begin{aligned} & (-2\sqrt{a-d}\sqrt{b^2-4cd})(b+2cx)\sqrt{a+x(b+cx)} \\ & \left[(2(a-d)(b^2-4cd) - 3(b^2+4c(a-2d)))(d+x(b+cx)) \right. \\ & \left. + (3b^4 + 8b^2c(a-4d) + 16c^2(3a^2 - 8ad + 8d^2)) \right. \\ & \left. (d+x(b+cx))^2 \operatorname{Log}[b - \sqrt{b^2-4cd} + 2cx] - (3b^4 + 8b^2c(a-4d) + 16c^2(3a^2 - 8ad + 8d^2)) \right. \\ & \left. (d+x(b+cx))^2 \operatorname{Log}[b + \sqrt{b^2-4cd} + 2cx] + (3b^4 + 8b^2c(a-4d) + 16c^2(3a^2 - 8ad + 8d^2)) \right. \\ & \left. (d+x(b+cx))^2 \operatorname{Log}[b^2 + b\sqrt{b^2-4cd} + 2c(-2a + \sqrt{b^2-4cd})x - 2\sqrt{a-d}\sqrt{a+x(b+cx)}] \right] \\ & - (3b^4 + 8b^2c(a-4d) + 16c^2(3a^2 - 8ad + 8d^2))(d+x(b+cx))^2 \operatorname{Log}[-b^2 + b\sqrt{b^2-4cd} + 2c(2a + \sqrt{b^2-4cd})x + 2\sqrt{a-d}\sqrt{a+x(b+cx)}] \\ & \left. \right) / (8(a-d)^{5/2}(b^2-4cd)^{5/2}(d+x(b+cx))^2) \end{aligned}$$

Maple [B] time = 0.037, size = 1884, normalized size = 8.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(c*x^2+b*x+d)^3/(c*x^2+b*x+a)^(1/2),x)`

[Out]
$$\begin{aligned} & -1/2/(b^2-4cd)^{3/2}/(a-d)/(x+1/2b/c-1/2c(b^2-4cd)^{1/2})^2 \\ & \left((x-1/2(-b+(b^2-4cd)^{1/2})/c)^2 c + (b^2-4cd)^{1/2}(x-1/2(-b+(b^2-4cd)^{1/2})/c) \right. \\ & \left. + a-d \right)^{1/2} + 3/4/(b^2-4cd)/(a-d)^2/(x+1/2b/c-1/2c(b^2-4cd)^{1/2}) \\ & \left((x-1/2(-b+(b^2-4cd)^{1/2})/c)^2 c + (b^2-4cd)^{1/2}(x-1/2(-b+(b^2-4cd)^{1/2})/c) \right. \\ & \left. + a-d \right)^{1/2} - 3/8/(b^2-4cd)^{3/2}/(a-d)^{5/2} \ln\left((2a-2d+(b^2-4cd)^{1/2})(x-1/2(-b+(b^2-4cd)^{1/2})/c) \right. \\ & \left. + 2(a-d)^{1/2}((x-1/2(-b+(b^2-4cd)^{1/2})/c)^2 c + (b^2-4cd)^{1/2}(x-1/2(-b+(b^2-4cd)^{1/2})/c) \right. \\ & \left. + a-d) \right)^{1/2} \end{aligned}$$

$$\begin{aligned}
& 2)) / c + a - d)^{(1/2)} / (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)) * b^2 + 3/2 / (b^2 - 4 * c * d)^{(3/2)} / (a - d)^{(5/2)} * \ln((2 * a - 2 * d + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)) * c * d - 1 / (b^2 - 4 * c * d)^{(3/2)} * c / (a - d)^{(3/2)} * \ln((2 * a - 2 * d + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)) + 3 / (b^2 - 4 * c * d)^2 * c / (a - d) / (x + 1/2 * b / c - 1/2 * c * (b^2 - 4 * c * d)^{(1/2)}) * ((x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)} - 6 * c^2 / (b^2 - 4 * c * d)^{(5/2)} / (a - d)^{(1/2)} * \ln((2 * a - 2 * d + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c + (b^2 - 4 * c * d)^{(1/2)} * (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x - 1/2 * (-b + (b^2 - 4 * c * d)^{(1/2)}) / c)) + 1/2 / (b^2 - 4 * c * d)^{(3/2)} / (a - d) / (x + 1/2 * b / c + 1/2 * c * (b^2 - 4 * c * d)^{(1/2)})^2 * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)} + 3/4 / (b^2 - 4 * c * d) / (a - d)^2 / (x + 1/2 * b / c + 1/2 * c * (b^2 - 4 * c * d)^{(1/2)}) * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)} + 3/8 / (b^2 - 4 * c * d)^{(3/2)} / (a - d)^{(5/2)} * \ln((2 * a - 2 * d - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)) * b^2 - 3/2 / (b^2 - 4 * c * d)^{(3/2)} / (a - d)^{(5/2)} * \ln((2 * a - 2 * d - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)) * c * d + 1 / (b^2 - 4 * c * d)^{(3/2)} * c / (a - d)^{(3/2)} * \ln((2 * a - 2 * d - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)) + 3 / (b^2 - 4 * c * d)^2 * c / (a - d) / (x + 1/2 * b / c + 1/2 * c * (b^2 - 4 * c * d)^{(1/2)}) * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)} + 6 * c^2 / (b^2 - 4 * c * d)^{(5/2)} / (a - d)^{(1/2)} * \ln((2 * a - 2 * d - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + 2 * (a - d)^{(1/2)} * ((x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c)^2 * c - (b^2 - 4 * c * d)^{(1/2)} * (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c) + a - d)^{(1/2)}) / (x + 1/2 * (b + (b^2 - 4 * c * d)^{(1/2)}) / c))
\end{aligned}$$

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(cx^2 + bx + d)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3), x, algorithm="maxima")

[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3), x)

Fricas [A] time = 1.79157, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3),x, algorithm="fricas")

[Out]
$$\begin{aligned} & [-1/16*(4*(2*a*b^3 + 32*b*c*d^2 - 6*(b^2*c^2 + 4*a*c^3 - 8*c^3*d) \\ & *x^3 - 9*(b^3*c + 4*a*b*c^2 - 8*b*c^2*d)*x^2 - 5*(b^3 + 4*a*b*c)* \\ & d - (3*b^4 + 8*a*b^2*c - 64*c^2*d^2 - 2*(7*b^2*c - 20*a*c^2)*d)*x \\ &)*\sqrt{a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d}*\sqrt{c*x^2 + b*x + a} - \\ & (128*c^2*d^4 + (3*b^4*c^2 + 8*a*b^2*c^3 + 48*a^2*c^4 + 128*c^4*d \\ & ^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 - 32*(b^2*c + 4*a*c^2)*d^3 + 2 \\ & *(3*b^5*c + 8*a*b^3*c^2 + 48*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*c \\ & ^2 + 4*a*b*c^3)*d)*x^3 + (3*b^4 + 8*a*b^2*c + 48*a^2*c^2)*d^2 + \\ & (3*b^6 + 8*a*b^4*c + 48*a^2*b^2*c^2 + 256*c^3*d^3 + 64*(b^2*c^2 - \\ & 4*a*c^3)*d^2 - 2*(13*b^4*c + 56*a*b^2*c^2 - 48*a^2*c^3)*d)*x^2 + \\ & 2*(128*b*c^2*d^3 - 32*(b^3*c + 4*a*b*c^2)*d^2 + (3*b^5 + 8*a*b^3 \\ & *c + 48*a^2*b*c^2)*d)*x)*\log(((8*a^2*b^4 + (b^4*c^2 + 24*a*b^2*c^3 \\ & + 16*a^2*c^4 + 128*c^4*d^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 + 2* \\ & (b^5*c + 24*a*b^3*c^2 + 16*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*c^2 \\ & + 4*a*b*c^3)*d)*x^3 + (b^4 + 24*a*b^2*c + 16*a^2*c^2)*d^2 + (b^6 \\ & + 32*a*b^4*c + 48*a^2*b^2*c^2 + 32*(5*b^2*c^2 + 4*a*c^3)*d^2 - \\ & 2*(19*b^4*c + 104*a*b^2*c^2 + 48*a^2*c^3)*d)*x^2 - 8*(a*b^4 + 4*a \\ & ^2*b^2*c)*d + 2*(4*a*b^5 + 16*a^2*b^3*c + 16*(b^3*c + 4*a*b*c^2)* \\ & d^2 - (3*b^5 + 40*a*b^3*c + 48*a^2*b*c^2)*d)*x)*\sqrt{a*b^2 + 4*c* \\ & d^2 - (b^2 + 4*a*c)*d} - 4*(2*a^2*b^5 - 4*(b^3*c + 4*a*b*c^2)*d^3 \\ & + 2*(a*b^4*c^2 + 4*a^2*b^2*c^3 - 32*c^4*d^3 + 12*(b^2*c^3 + 4*a* \\ & c^4)*d^2 - (b^4*c^2 + 16*a*b^2*c^3 + 16*a^2*c^4)*d)*x^3 + (b^5 + \\ & 16*a*b^3*c + 16*a^2*b*c^2)*d^2 + 3*(a*b^5*c + 4*a^2*b^3*c^2 - 32* \\ & b*c^3*d^3 + 12*(b^3*c^2 + 4*a*b*c^3)*d^2 - (b^5*c + 16*a*b^3*c^2 \\ & + 16*a^2*b*c^3)*d)*x^2 - 3*(a*b^5 + 4*a^2*b^3*c)*d + (a*b^6 + 8*a \\ & ^2*b^4*c - 8*(5*b^2*c^2 + 4*a*c^3)*d^3 + 2*(7*b^4*c + 40*a*b^2*c^2 \\ & + 16*a^2*c^3)*d^2 - (b^6 + 22*a*b^4*c + 40*a^2*b^2*c^2)*d)*x)*\sqrt{ \\ & c*x^2 + b*x + a})/(c^2*x^4 + 2*b*c*x^3 + 2*b*d*x + (b^2 + 2*c \\ & *d)*x^2 + d^2))/((a^2*b^4*d^2 + 16*c^2*d^6 - 8*(b^2*c + 4*a*c^2) \\ & *d^5 + (b^4 + 16*a*b^2*c + 16*a^2*c^2)*d^4 + (a^2*b^4*c^2 + 16*c^4 \\ & *d^4 - 8*(b^2*c^3 + 4*a*c^4)*d^3 + (b^4*c^2 + 16*a*b^2*c^3 + 16* \\ & a^2*c^4)*d^2 - 2*(a*b^4*c^2 + 4*a^2*b^2*c^3)*d)*x^4 - 2*(a*b^4 + \\ & 4*a^2*b^2*c)*d^3 + 2*(a^2*b^5*c + 16*b*c^3*d^4 - 8*(b^3*c^2 + 4*a* \\ & *b*c^3)*d^3 + (b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d^2 - 2*(a*b^5 \\ & *c + 4*a^2*b^3*c^2)*d)*x^3 + (a^2*b^6 - 64*a*c^3*d^4 + 32*c^3*d^5 \\ & - 2*(3*b^4*c - 16*a^2*c^3)*d^3 + (b^6 + 12*a*b^4*c)*d^2 - 2*(a* \\ & b^6 + 3*a^2*b^4*c)*d)*x^2 + 2*(a^2*b^5*d + 16*b*c^2*d^5 - 8*(b^3*c \\ & + 4*a*b*c^2)*d^4 + (b^5 + 16*a*b^3*c + 16*a^2*b*c^2)*d^3 - 2*(a \\ & *b^5 + 4*a^2*b^3*c)*d^2)*x)*\sqrt{a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)* \\ & d}), -1/8*(2*(2*a*b^3 + 32*b*c*d^2 - 6*(b^2*c^2 + 4*a*c^3 - 8*c^3 \\ & *d)*x^3 - 9*(b^3*c + 4*a*b*c^2 - 8*b*c^2*d)*x^2 - 5*(b^3 + 4*a*b* \\ & c)*d - (3*b^4 + 8*a*b^2*c - 64*c^2*d^2 - 2*(7*b^2*c - 20*a*c^2)*d \end{aligned}$$

$$\begin{aligned}
&) * x) * \sqrt{-a * b^2 - 4 * c * d^2 + (b^2 + 4 * a * c) * d} * \sqrt{c * x^2 + b * x + a} - (128 * c^2 * d^4 + (3 * b^4 * c^2 + 8 * a * b^2 * c^3 + 48 * a^2 * c^4 + 128 * c^4 * d^2 - 32 * (b^2 * c^3 + 4 * a * c^4) * d) * x^4 - 32 * (b^2 * c + 4 * a * c^2) * d^3 \\
& + 2 * (3 * b^5 * c + 8 * a * b^3 * c^2 + 48 * a^2 * b * c^3 + 128 * b * c^3 * d^2 - 32 * (b^3 * c^2 + 4 * a * b * c^3) * d) * x^3 + (3 * b^4 + 8 * a * b^2 * c + 48 * a^2 * c^2) * d^2 \\
& + (3 * b^6 + 8 * a * b^4 * c + 48 * a^2 * b^2 * c^2 + 256 * c^3 * d^3 + 64 * (b^2 * c^2 - 4 * a * c^3) * d^2 - 2 * (13 * b^4 * c + 56 * a * b^2 * c^2 - 48 * a^2 * c^3) * d) * x^2 \\
& + 2 * (128 * b * c^2 * d^3 - 32 * (b^3 * c + 4 * a * b * c^2) * d^2 + (3 * b^5 + 8 * a * b^3 * c + 48 * a^2 * b * c^2) * d) * x) * \arctan(-1/2 * (2 * a * b^2 + (b^2 * c + 4 * a * c^2 - 8 * c^2 * d) * x^2 - (b^2 + 4 * a * c) * d + (b^3 + 4 * a * b * c - 8 * b * c * d) * x) * \sqrt{-a * b^2 - 4 * c * d^2 + (b^2 + 4 * a * c) * d} / ((a * b^3 + 4 * b * c * d^2 - (b^3 + 4 * a * b * c) * d + 2 * (a * b^2 * c + 4 * c^2 * d^2 - (b^2 * c + 4 * a * c^2) * d) * x) * \sqrt{c * x^2 + b * x + a}))) / ((a^2 * b^4 * d^2 + 16 * c^2 * d^6 - 8 * (b^2 * c + 4 * a * c^2) * d^5 + (b^4 + 16 * a * b^2 * c + 16 * a^2 * c^2) * d^4 + (a^2 * b^4 * c^2 + 16 * c^4 * d^4 - 8 * (b^2 * c^3 + 4 * a * c^4) * d^3 + (b^4 * c^2 + 16 * a * b^2 * c^3 + 16 * a^2 * c^4) * d^2 - 2 * (a * b^4 * c^2 + 4 * a^2 * b^2 * c^3) * d) * x^4 - 2 * (a * b^4 + 4 * a^2 * b^2 * c) * d^3 + 2 * (a^2 * b^5 * c + 16 * b * c^3 * d^4 - 8 * (b^3 * c^2 + 4 * a * b * c^3) * d^3 + (b^5 * c + 16 * a * b^3 * c^2 + 16 * a^2 * b * c^3) * d^2 - 2 * (a * b^5 * c + 4 * a^2 * b^3 * c^2) * d) * x^3 + (a^2 * b^6 - 64 * a * c^3 * d^4 + 32 * c^3 * d^5 - 2 * (3 * b^4 * c - 16 * a^2 * c^3) * d^3 + (b^6 + 12 * a * b^4 * c) * d^2 - 2 * (a * b^6 + 3 * a^2 * b^4 * c) * d) * x^2 + 2 * (a^2 * b^5 * d + 16 * b * c^2 * d^5 - 8 * (b^3 * c + 4 * a * b * c^2) * d^4 + (b^5 + 16 * a * b^3 * c + 16 * a^2 * b * c^2) * d^3 - 2 * (a * b^5 + 4 * a^2 * b^3 * c) * d^2) * x) * \sqrt{-a * b^2 - 4 * c * d^2 + (b^2 + 4 * a * c) * d}]]
\end{aligned}$$

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/(c*x**2+b*x+d)**3/(c*x**2+b*x+a)**(1/2),x)

[Out] Timed out

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a) * (c*x^2 + b*x + d)^3),x, algorithm="giac")

[Out] Exception raised: TypeError

$$3.6 \quad \int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)^4} dx$$

Optimal. Leaf size=328

$$\begin{aligned} & \frac{(b+2cx)(16c^2(15a^2-44ad+44d^2)+8b^2c(7a-22d)+15b^4)\sqrt{a+bx+cx^2}}{24(a-d)^3(b^2-4cd)^3(bx+cx^2+d)} \\ & + \frac{(4c(a-2d)+b^2)(16c^2(5a^2-8ad+8d^2)-8b^2c(a+4d)+5b^4)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{8(a-d)^{7/2}(b^2-4cd)^{7/2}} \\ & + \frac{5(b+2cx)(4c(a-2d)+b^2)\sqrt{a+bx+cx^2}}{12(a-d)^2(b^2-4cd)^2(bx+cx^2+d)^2} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{3(a-d)(b^2-4cd)(bx+cx^2+d)^3} \end{aligned}$$

[Out] $-\left((b+2cx)\sqrt{a+bx+cx^2}\right)/\left(3(a-d)(b^2-4cd)(d+bx+cx^2)^3\right) + \left(5(b^2+4c(a-2d))(b+2cx)\sqrt{a+bx+cx^2}\right)/\left(12(a-d)^2(b^2-4cd)^2(d+bx+cx^2)^2\right) - \left((15b^4+8b^2c(7a-22d)+16c^2(15a^2-44ad+44d^2))(b+2cx)\sqrt{a+bx+cx^2}\right)/\left(24(a-d)^3(b^2-4cd)^3(d+bx+cx^2)\right) + \left((b^2+4c(a-2d))(5b^4-8b^2c(a+4d)+16c^2(5a^2-8ad+8d^2))\operatorname{ArcTanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)\right)/\left(8(a-d)^{7/2}(b^2-4cd)^{7/2}\right)$

Rubi [A] time = 2.11096, antiderivative size = 328, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{(b+2cx)(16c^2(15a^2-44ad+44d^2)+8b^2c(7a-22d)+15b^4)\sqrt{a+bx+cx^2}}{24(a-d)^3(b^2-4cd)^3(bx+cx^2+d)} \\ & + \frac{(4c(a-2d)+b^2)(16c^2(5a^2-8ad+8d^2)-8b^2c(a+4d)+5b^4)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{8(a-d)^{7/2}(b^2-4cd)^{7/2}} \\ & + \frac{5(b+2cx)(4c(a-2d)+b^2)\sqrt{a+bx+cx^2}}{12(a-d)^2(b^2-4cd)^2(bx+cx^2+d)^2} - \frac{(b+2cx)\sqrt{a+bx+cx^2}}{3(a-d)(b^2-4cd)(bx+cx^2+d)^3} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^4), x]

[Out] $-\left((b+2cx)\sqrt{a+bx+cx^2}\right)/\left(3(a-d)(b^2-4cd)(d+bx+cx^2)^3\right) + \left(5(b^2+4c(a-2d))(b+2cx)\sqrt{a+bx+cx^2}\right)/\left(12(a-d)^2(b^2-4cd)^2(d+bx+cx^2)^2\right) - \left((15b^4+8b^2c(7a-22d)+16c^2(15a^2-44ad+44d^2))(b+2cx)\sqrt{a+bx+cx^2}\right)/\left(24(a-d)^3(b^2-4cd)^3(d+bx+cx^2)\right) + \left((b^2+4c(a-2d))(5b^4-8b^2c(a+4d)+16c^2(5a^2-8ad+8d^2))\operatorname{ArcTanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)\right)/\left(8(a-d)^{7/2}(b^2-4cd)^{7/2}\right)$

$$c^*(a + 4*d) + 16*c^2*(5*a^2 - 8*a*d + 8*d^2))*ArcTanh[(Sqrt[a - d]*(b + 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x + c*x^2])]/(8*(a - d)^(7/2)*(b^2 - 4*c*d)^(7/2))$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(c*x**2+b*x+d)**4/(c*x**2+b*x+a)**(1/2),x)`

[Out] Timed out

Mathematica [B] time = 6.34836, size = 901, normalized size = 2.75

$$\frac{(cx^2 + bx + a) \left(-\frac{-b-2cx}{3(a-d)(4cd-b^2)(cx^2+bx+d)^3} + \frac{15b^5+30cxb^4+56acb^3-176cdb^3+112ac^2xb^2-352c^2dxb^2+240a^2c^2b+704c^2d^2b-704ac^2db+480a^2c^3x+24(a-d)^3(4cd-b^2)^3(cx^2+bx+d)}{24(a-d)^3(4cd-b^2)^3(cx^2+bx+d)} \right)}{\sqrt{a+x(b+cx)}} + \frac{(b^2 + 4ac - 8cd) (5b^4 - 8acb^2 - 32cdb^2 + 80a^2c^2 + 128c^2d^2 - 128ac^2d) \sqrt{cx^2 + bx + a} \log \left(b + 2cx - \sqrt{b^2 - 4cd} \right)}{16\sqrt{a-d}(d-a)^3(b^2-4cd)^{7/2}\sqrt{a+x(b+cx)}} + \frac{(b^2 + 4ac - 8cd) (5b^4 - 8acb^2 - 32cdb^2 + 80a^2c^2 + 128c^2d^2 - 128ac^2d) \sqrt{cx^2 + bx + a} \log \left(b + 2cx + \sqrt{b^2 - 4cd} \right)}{16\sqrt{a-d}(d-a)^3(b^2-4cd)^{7/2}\sqrt{a+x(b+cx)}} + \frac{(b^2 + 4ac - 8cd) (5b^4 - 8acb^2 - 32cdb^2 + 80a^2c^2 + 128c^2d^2 - 128ac^2d) \sqrt{cx^2 + bx + a} \log \left(b^2 + \sqrt{b^2 - 4cd}b - 4ac + 2c\sqrt{b^2 - 4cd} \right)}{16\sqrt{a-d}(d-a)^3(b^2-4cd)^{7/2}\sqrt{a+x(b+cx)}} + \frac{(b^2 + 4ac - 8cd) (5b^4 - 8acb^2 - 32cdb^2 + 80a^2c^2 + 128c^2d^2 - 128ac^2d) \sqrt{cx^2 + bx + a} \log \left(-b^2 + \sqrt{b^2 - 4cd}b + 4ac + 2c\sqrt{b^2 - 4cd} \right)}{16\sqrt{a-d}(d-a)^3(b^2-4cd)^{7/2}\sqrt{a+x(b+cx)}}$$

Antiderivative was successfully verified.

[In] `Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^4),x]`

$$((a + b*x + c*x^2)*(-(-b - 2*c*x)/(3*(a - d)*(-b^2 + 4*c*d)*(d + b*x + c*x^2)^3) + (5*(b^3 + 4*a*b*c - 8*b*c*d + 2*b^2*c*x + 8*a*c^2*x - 16*c^2*d*x))/(12*(a - d)^2*(-b^2 + 4*c*d)^2*(d + b*x + c*x^2)^2) + (15*b^5 + 56*a*b^3*c + 240*a^2*b*c^2 - 176*b^3*c*d - 704*a*b*c^2*d + 704*b*c^2*d^2 + 30*b^4*c*x + 112*a*b^2*c^2*x + 480*a^2*c^3*x - 352*b^2*c^2*d*x - 1408*a*c^3*d*x + 1408*c^3*d^2*x)/(24*(a - d)^3*(-b^2 + 4*c*d)^3*(d + b*x + c*x^2))))/Sqrt[a + x*(b +$$

$$\begin{aligned}
& c*x)] + ((b^2 + 4*a*c - 8*c*d)*(5*b^4 - 8*a*b^2*c + 80*a^2*c^2 - \\
& 32*b^2*c*d - 128*a*c^2*d + 128*c^2*d^2)*\text{Sqrt}[a + b*x + c*x^2]*\text{Log} \\
& [b - \text{Sqrt}[b^2 - 4*c*d] + 2*c*x])/((16*\text{Sqrt}[a - d]*(-a + d)^3*(b^2 \\
& - 4*c*d)^{(7/2)}*\text{Sqrt}[a + x*(b + c*x)]) - ((b^2 + 4*a*c - 8*c*d)*(5 \\
& *b^4 - 8*a*b^2*c + 80*a^2*c^2 - 32*b^2*c*d - 128*a*c^2*d + 128*c^2 \\
& *d^2)*\text{Sqrt}[a + b*x + c*x^2]*\text{Log}[b + \text{Sqrt}[b^2 - 4*c*d] + 2*c*x])/ \\
& (16*\text{Sqrt}[a - d]*(-a + d)^3*(b^2 - 4*c*d)^{(7/2)}*\text{Sqrt}[a + x*(b + c \\
& *x)]) + ((b^2 + 4*a*c - 8*c*d)*(5*b^4 - 8*a*b^2*c + 80*a^2*c^2 - 3 \\
& 2*b^2*c*d - 128*a*c^2*d + 128*c^2*d^2)*\text{Sqrt}[a + b*x + c*x^2]*\text{Log}[\\
& b^2 - 4*a*c + b*\text{Sqrt}[b^2 - 4*c*d] + 2*c*\text{Sqrt}[b^2 - 4*c*d]*x - 4*c \\
& *\text{Sqrt}[a - d]*\text{Sqrt}[a + b*x + c*x^2])/((16*\text{Sqrt}[a - d]*(-a + d)^3*(\\
& b^2 - 4*c*d)^{(7/2)}*\text{Sqrt}[a + x*(b + c*x)]) - ((b^2 + 4*a*c - 8*c*d \\
&)*(5*b^4 - 8*a*b^2*c + 80*a^2*c^2 - 32*b^2*c*d - 128*a*c^2*d + 12 \\
& 8*c^2*d^2)*\text{Sqrt}[a + b*x + c*x^2]*\text{Log}[-b^2 + 4*a*c + b*\text{Sqrt}[b^2 - \\
& 4*c*d] + 2*c*\text{Sqrt}[b^2 - 4*c*d]*x + 4*c*\text{Sqrt}[a - d]*\text{Sqrt}[a + b*x + \\
& c*x^2])/((16*\text{Sqrt}[a - d]*(-a + d)^3*(b^2 - 4*c*d)^{(7/2)}*\text{Sqrt}[a + \\
& x*(b + c*x)])
\end{aligned}$$

Maple [B] time = 0.047, size = 3695, normalized size = 11.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(c*x^2+b*x+d)^4/(c*x^2+b*x+a)^{(1/2)}, x)$

[Out]
$$\begin{aligned}
& 5/2/(b^2-4*c*d)^2/(a-d)^3/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^{(1/2)})*((x \\
& -1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)^2*c+(b^2-4*c*d)^{(1/2)}*(x-1/2*(-b+(\\
& b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)}*c*d+5/2/(b^2-4*c*d)^2/(a-d)^3/(x+ \\
& 1/2*b/c+1/2/c*(b^2-4*c*d)^{(1/2)})*((x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c) \\
& ^2*c-(b^2-4*c*d)^{(1/2)}*(x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)} \\
& *c*d-5/4/(b^2-4*c*d)^{(3/2)}/(a-d)^{(7/2)}*\ln((2*a-2*d+(b^2-4*c*d)^{(1/2)} \\
& *(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)+2*(a-d)^{(1/2)}*((x-1/2*(-b+(b \\
& ^2-4*c*d)^{(1/2)})/c)^2*c+(b^2-4*c*d)^{(1/2)}*(x-1/2*(-b+(b^2-4*c*d)^ \\
& (1/2))/c)+a-d)^{(1/2)})/(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)*c*d+5/4/(\\
& b^2-4*c*d)^{(3/2)}/(a-d)^{(7/2)}*\ln((2*a-2*d-(b^2-4*c*d)^{(1/2)}*(x+1/2 \\
& *(b+(b^2-4*c*d)^{(1/2)})/c)+2*(a-d)^{(1/2)}*((x+1/2*(b+(b^2-4*c*d)^{(1/2)} \\
&)/c)^2*c-(b^2-4*c*d)^{(1/2)}*(x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)+a-d \\
&)^{(1/2)})/(x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)*c*d-5/12/(b^2-4*c*d)^{(3 \\
& /2)}/(a-d)^2/(x+1/2*b/c+1/2/c*(b^2-4*c*d)^{(1/2)})^2*((x+1/2*(b+(b^2 \\
& -4*c*d)^{(1/2)})/c)^2*c-(b^2-4*c*d)^{(1/2)}*(x+1/2*(b+(b^2-4*c*d)^{(1/2)} \\
&)/c)+a-d)^{(1/2)}-5/16/(b^2-4*c*d)^{(3/2)}/(a-d)^{(7/2)}*\ln((2*a-2*d- \\
& (b^2-4*c*d)^{(1/2)}*(x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)+2*(a-d)^{(1/2)}*(\\
& (x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)^2*c-(b^2-4*c*d)^{(1/2)}*(x+1/2*(b+(\\
& b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)})/(x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c) \\
& *b^2+3/4/(b^2-4*c*d)^{(3/2)}/(a-d)^{(5/2)}*c*\ln((2*a-2*d-(b^2-4*c*d)^ \\
& (1/2)* (x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)+2*(a-d)^{(1/2)}*((x+1/2*(b+(b \\
& ^2-4*c*d)^{(1/2)})/c)^2*c-(b^2-4*c*d)^{(1/2)}*(x+1/2*(b+(b^2-4*c*d)^{(1/2)} \\
&)/c)+a-d)^{(1/2)})/(x+1/2*(b+(b^2-4*c*d)^{(1/2)})/c)-20*c^3/(b^2
\end{aligned}$$

$$\begin{aligned}
& -4^*c^*d)^{(7/2)}/(a-d)^{(1/2)} * \ln((2^*a-2^*d-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b \\
& +(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)} \\
&)/c)^2*c-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)})/c)+a-d)^{(\\
& 1/2)}/(x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))-3/(b^{\wedge}2-4^*c^*d)^{(5/2)} * c^2/(a \\
& -d)^{(3/2)} * \ln((2^*a-2^*d-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/ \\
& 2)))/c)+2^*(a-d)^{(1/2)} * ((x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)})/c)^2*c-(b^{\wedge}2-4^* \\
& c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}/(x+1/2^*(b+ \\
& (b^{\wedge}2-4^*c^*d)^{(1/2)))/c))-1/3/(b^{\wedge}2-4^*c^*d)^2/(a-d)/(x+1/2^*b/c+1/2/c^*(\\
& b^{\wedge}2-4^*c^*d)^{(1/2)})^3*((x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^*c \\
& ^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}+20^*c^3/(b^{\wedge}2- \\
& 4^*c^*d)^{(7/2)}/(a-d)^{(1/2)} * \ln((2^*a-2^*d+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b \\
& +(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2) \\
&))/c)^2*c+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d) \\
& ^{(1/2)}/(x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))+3/(b^{\wedge}2-4^*c^*d)^{(5/2)} * c^2 \\
& /(a-d)^{(3/2)} * \ln((2^*a-2^*d+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d) \\
& ^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c+(b \\
& ^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}/(x-1 \\
& /2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))-1/3/(b^{\wedge}2-4^*c^*d)^2/(a-d)/(x+1/2^*b/c- \\
& 1/2/c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})^3*((x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c+ \\
& (b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}+5/1 \\
& 6/(b^{\wedge}2-4^*c^*d)^{(3/2)}/(a-d)^{(7/2)} * \ln((2^*a-2^*d+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x- \\
& 1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x-1/2^*(-b+(b^{\wedge}2-4^*c^* \\
& d)^{(1/2)))/c)^2*c+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/ \\
& c)+a-d)^{(1/2)}/(x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))*b^{\wedge}2-3/4/(b^{\wedge}2-4^*c \\
& ^*d)^{(3/2)}/(a-d)^{(5/2)} * c * \ln((2^*a-2^*d+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+ \\
& (b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2) \\
&)/c)^2*c+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d) \\
& ^{(1/2)}/(x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))+5/12/(b^{\wedge}2-4^*c^*d)^{(3/2)}/(\\
& a-d)^2/(x+1/2^*b/c-1/2/c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})^2*((x-1/2^*(-b+(b^{\wedge}2-4^*c \\
& ^*d)^{(1/2)))/c)^2*c+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)) \\
&)/c)+a-d)^{(1/2)}-3/2/(b^{\wedge}2-4^*c^*d)^{(5/2)} * c/(a-d)^{(5/2)} * \ln((2^*a-2^*d-(b \\
& ^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x \\
& +1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge} \\
& 2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}/(x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))*b \\
& ^{\wedge}2+6/(b^{\wedge}2-4^*c^*d)^{(5/2)} * c^2/(a-d)^{(5/2)} * \ln((2^*a-2^*d-(b^{\wedge}2-4^*c^*d)^{(1 \\
& /2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+2^*(a-d)^{(1/2)} * ((x+1/2^*(b+(b^{\wedge} \\
& 2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/ \\
& 2)))/c)+a-d)^{(1/2)}/(x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c))*d-10/(b^{\wedge}2-4^*c \\
& ^*d)^3*c^2/(a-d)/(x+1/2^*b/c+1/2/c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})*((x+1/2^*(b+(b \\
& ^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(\\
& 1/2))/c)+a-d)^{(1/2)}-2/(b^{\wedge}2-4^*c^*d)^{(5/2)} * c/(a-d)/(x+1/2^*b/c+1/2/c^* \\
& (b^{\wedge}2-4^*c^*d)^{(1/2)})^2*((x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^* \\
& c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}-5/8/(b^{\wedge}2-4^* \\
& c^*d)^2/(a-d)^3/(x+1/2^*b/c+1/2/c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})*((x+1/2^*(b+(b^{\wedge} \\
& 2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1 \\
& /2))/c)+a-d)^{(1/2)} * b^{\wedge}2-7/3/(b^{\wedge}2-4^*c^*d)^2*c/(a-d)^2/(x+1/2^*b/c+1/2 \\
& /c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})*((x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c-(b^{\wedge}2-4^ \\
& ^*c^*d)^{(1/2)} * (x+1/2^*(b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}-10/(b^{\wedge}2-4^* \\
& c^*d)^3*c^2/(a-d)/(x+1/2^*b/c-1/2/c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})*((x-1/2^*(-b+ \\
& (b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c+(b^{\wedge}2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d \\
&)^{(1/2))/c)+a-d)^{(1/2)}+2/(b^{\wedge}2-4^*c^*d)^{(5/2)} * c/(a-d)/(x+1/2^*b/c-1/2 \\
& /c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})^2*((x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)^2*c+(b^{\wedge} \\
& 2-4^*c^*d)^{(1/2)} * (x-1/2^*(-b+(b^{\wedge}2-4^*c^*d)^{(1/2)))/c)+a-d)^{(1/2)}-7/3/(b \\
& ^{\wedge}2-4^*c^*d)^2*c/(a-d)^2/(x+1/2^*b/c-1/2/c^*(b^{\wedge}2-4^*c^*d)^{(1/2)})*((x-1/2
\end{aligned}$$

$$\begin{aligned} & * (-b+(b^2-4*c*d)^{(1/2)})/c)^2*c+(b^2-4*c*d)^{(1/2)}*(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)}+3/2/(b^2-4*c*d)^{(5/2)}*c/(a-d)^{(5/2)}* \\ & \ln((2*a-2*d+(b^2-4*c*d)^{(1/2)}*(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)+2*(a-d)^{(1/2)}*((x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)^2*c+(b^2-4*c*d)^{(1/2)} \\ &)*(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)})/(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c))^2*b^2-6/(b^2-4*c*d)^{(5/2)}*c^2/(a-d)^{(5/2)}*\ln((2*a-2 \\ & *d+(b^2-4*c*d)^{(1/2)}*(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)+2*(a-d)^{(1/2)}*((x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)^2*c+(b^2-4*c*d)^{(1/2)}*(x-1/2 \\ & *(-b+(b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)})/(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c))^2*d-5/8/(b^2-4*c*d)^2/(a-d)^3/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^{(1/2)} \\ &)*((x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)^2*c+(b^2-4*c*d)^{(1/2)}*(x-1/2*(-b+(b^2-4*c*d)^{(1/2)})/c)+a-d)^{(1/2)}*b^2 \end{aligned}$$

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(cx^2 + bx + d)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4),x, algorithm="maxima")

[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4), x)

Fricas [A] time = 11.338, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4),x, algorithm="fricas")

[Out]
$$\begin{aligned} & [-1/96*(4*(8*a^2*b^5 + 1152*b*c^2*d^4 + 2*(15*b^4*c^3 + 56*a*b^2*c^4 + 240*a^2*c^5 + 704*c^5*d^2 - 176*(b^2*c^4 + 4*a*c^5)*d)*x^5 \\ & + 5*(15*b^5*c^2 + 56*a*b^3*c^3 + 240*a^2*b*c^4 + 704*b*c^4*d^2 - 176*(b^3*c^3 + 4*a*b*c^4)*d)*x^4 - 360*(b^3*c + 4*a*b*c^2)*d^3 + \\ & 4*(15*b^6*c + 51*a*b^4*c^2 + 220*a^2*b^2*c^3 + 864*c^4*d^3 + 4*(17*b^2*c^3 - 236*a*c^4)*d^2 - 4*(39*b^4*c^2 + 142*a*b^2*c^3 - 80*a^2*c^4)*d)*x^3 + (33*b^5 + 344*a*b^3*c + 528*a^2*b*c^2)*d^2 + (15*b^7 + 26*a*b^5*c + 120*a^2*b^3*c^2 + 5184*b*c^3*d^3 - 8*(89*b^3*c^2 + 708*a*b*c^3)*d^2 - 8*(7*b^5*c - 14*a*b^3*c^2 - 240*a^2*b*c^3)*d)*x^2 - 26*(a*b^5 + 4*a^2*b^3*c)*d - 2*(5*a*b^6 + 12*a^2*b^4*c - 1152*c^3*d^4 - 72*(7*b^2*c^2 - 20*a*c^3)*d^3 + (203*b^4*c + 600*a*b^2*c^2 - 528*a^2*c^3)*d^2 - 2*(10*b^6 + 55*a*b^4*c + 108*a^2*b^2*c^2)*d)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d)*sqrt(c \end{aligned}$$

$$\begin{aligned}
& x^2 + b \cdot x + a) - 3 \cdot (1024 \cdot c^3 \cdot d^6 - (5 \cdot b^6 \cdot c^3 + 12 \cdot a \cdot b^4 \cdot c^4 + 48 \\
& \cdot a^2 \cdot b^2 \cdot c^5 + 320 \cdot a^3 \cdot c^6 - 1024 \cdot c^6 \cdot d^3 + 384 \cdot (b^2 \cdot c^5 + 4 \cdot a \cdot c^6) \\
& \cdot d^2 - 24 \cdot (3 \cdot b^4 \cdot c^4 + 8 \cdot a \cdot b^2 \cdot c^5 + 48 \cdot a^2 \cdot c^6) \cdot d) \cdot x^6 - 384 \cdot (\\
& b^2 \cdot c^2 + 4 \cdot a \cdot c^3) \cdot d^5 - 3 \cdot (5 \cdot b^7 \cdot c^2 + 12 \cdot a \cdot b^5 \cdot c^3 + 48 \cdot a^2 \cdot b^3 \\
& \cdot c^4 + 320 \cdot a^3 \cdot b \cdot c^5 - 1024 \cdot b \cdot c^5 \cdot d^3 + 384 \cdot (b^3 \cdot c^4 + 4 \cdot a \cdot b \cdot c^5) \\
& \cdot d^2 - 24 \cdot (3 \cdot b^5 \cdot c^3 + 8 \cdot a \cdot b^3 \cdot c^4 + 48 \cdot a^2 \cdot b \cdot c^5) \cdot d) \cdot x^5 + 24 \cdot (3 \\
& \cdot b^4 \cdot c + 8 \cdot a \cdot b^2 \cdot c^2 + 48 \cdot a^2 \cdot c^3) \cdot d^4 - 3 \cdot (5 \cdot b^8 \cdot c + 12 \cdot a \cdot b^6 \cdot c^2 \\
& + 48 \cdot a^2 \cdot b^4 \cdot c^3 + 320 \cdot a^3 \cdot b^2 \cdot c^4 - 1024 \cdot c^5 \cdot d^4 - 128 \cdot (5 \cdot b^2 \cdot \\
& c^4 - 12 \cdot a \cdot c^5) \cdot d^3 + 24 \cdot (13 \cdot b^4 \cdot c^3 + 56 \cdot a \cdot b^2 \cdot c^4 - 48 \cdot a^2 \cdot c^5) \\
& \cdot d^2 - (67 \cdot b^6 \cdot c^2 + 180 \cdot a \cdot b^4 \cdot c^3 + 1104 \cdot a^2 \cdot b^2 \cdot c^4 - 320 \cdot a^3 \cdot c \\
& \cdot d^5) \cdot d) \cdot x^4 - (5 \cdot b^6 + 12 \cdot a \cdot b^4 \cdot c + 48 \cdot a^2 \cdot b^2 \cdot c^2 + 320 \cdot a^3 \cdot c^3) \cdot \\
& d^3 - (5 \cdot b^9 + 12 \cdot a \cdot b^7 \cdot c + 48 \cdot a^2 \cdot b^5 \cdot c^2 + 320 \cdot a^3 \cdot b^3 \cdot c^3 - 61 \\
& 44 \cdot b \cdot c^4 \cdot d^4 + 256 \cdot (5 \cdot b^3 \cdot c^3 + 36 \cdot a \cdot b \cdot c^4) \cdot d^3 - 48 \cdot (b^5 \cdot c^2 - 8 \\
& \cdot a \cdot b^3 \cdot c^3 + 144 \cdot a^2 \cdot b \cdot c^4) \cdot d^2 - 6 \cdot (7 \cdot b^7 \cdot c + 20 \cdot a \cdot b^5 \cdot c^2 + 144 \\
& \cdot a^2 \cdot b^3 \cdot c^3 - 320 \cdot a^3 \cdot b \cdot c^4) \cdot d) \cdot x^3 + 3 \cdot (1024 \cdot c^4 \cdot d^5 + 128 \cdot (5 \cdot b \\
& \cdot a^2 \cdot c^3 - 12 \cdot a \cdot c^4) \cdot d^4 - 24 \cdot (13 \cdot b^4 \cdot c^2 + 56 \cdot a \cdot b^2 \cdot c^3 - 48 \cdot a^2 \cdot c \\
& \cdot d^4) \cdot d^3 + (67 \cdot b^6 \cdot c + 180 \cdot a \cdot b^4 \cdot c^2 + 1104 \cdot a^2 \cdot b^2 \cdot c^3 - 320 \cdot a^3 \cdot \\
& c^4) \cdot d^2 - (5 \cdot b^8 + 12 \cdot a \cdot b^6 \cdot c + 48 \cdot a^2 \cdot b^4 \cdot c^2 + 320 \cdot a^3 \cdot b^2 \cdot c^3) \\
& \cdot d) \cdot x^2 + 3 \cdot (1024 \cdot b \cdot c^3 \cdot d^5 - 384 \cdot (b^3 \cdot c^2 + 4 \cdot a \cdot b \cdot c^3) \cdot d^4 + 24 \\
& \cdot (3 \cdot b^5 \cdot c + 8 \cdot a \cdot b^3 \cdot c^2 + 48 \cdot a^2 \cdot b \cdot c^3) \cdot d^3 - (5 \cdot b^7 + 12 \cdot a \cdot b^5 \cdot c \\
& + 48 \cdot a^2 \cdot b^3 \cdot c^2 + 320 \cdot a^3 \cdot b \cdot c^3) \cdot d^2) \cdot x) \cdot \log(((8 \cdot a^2 \cdot b^4 + (b^4 \\
& \cdot c^2 + 24 \cdot a \cdot b^2 \cdot c^3 + 16 \cdot a^2 \cdot c^4 + 128 \cdot c^4 \cdot d^2 - 32 \cdot (b^2 \cdot c^3 + 4 \cdot \\
& a \cdot c^4) \cdot d) \cdot x^4 + 2 \cdot (b^5 \cdot c + 24 \cdot a \cdot b^3 \cdot c^2 + 16 \cdot a^2 \cdot b \cdot c^3 + 128 \cdot b \cdot c^3 \\
& \cdot d^2 - 32 \cdot (b^3 \cdot c^2 + 4 \cdot a \cdot b \cdot c^3) \cdot d) \cdot x^3 + (b^4 + 24 \cdot a \cdot b^2 \cdot c + 16 \cdot \\
& a^2 \cdot c^2) \cdot d^2 + (b^6 + 32 \cdot a \cdot b^4 \cdot c + 48 \cdot a^2 \cdot b^2 \cdot c^2 + 32 \cdot (5 \cdot b^2 \cdot c^2 \\
& + 4 \cdot a \cdot c^3) \cdot d^2 - 2 \cdot (19 \cdot b^4 \cdot c + 104 \cdot a \cdot b^2 \cdot c^2 + 48 \cdot a^2 \cdot c^3) \cdot d) \cdot x^2 \\
& - 8 \cdot (a \cdot b^4 + 4 \cdot a^2 \cdot b^2 \cdot c) \cdot d + 2 \cdot (4 \cdot a \cdot b^5 + 16 \cdot a^2 \cdot b^3 \cdot c + 16 \cdot (b \\
& \cdot a^3 \cdot c + 4 \cdot a \cdot b \cdot c^2) \cdot d^2 - (3 \cdot b^5 + 40 \cdot a \cdot b^3 \cdot c + 48 \cdot a^2 \cdot b \cdot c^2) \cdot d) \cdot x) \\
& \cdot \sqrt{(a \cdot b^2 + 4 \cdot c \cdot d^2 - (b^2 + 4 \cdot a \cdot c) \cdot d) - 4 \cdot (2 \cdot a^2 \cdot b^5 - 4 \cdot (b^3 \cdot \\
& c + 4 \cdot a \cdot b \cdot c^2) \cdot d^3 + 2 \cdot (a \cdot b^4 \cdot c^2 + 4 \cdot a^2 \cdot b^2 \cdot c^3 - 32 \cdot c^4 \cdot d^3 + \\
& 12 \cdot (b^2 \cdot c^3 + 4 \cdot a \cdot c^4) \cdot d^2 - (b^4 \cdot c^2 + 16 \cdot a \cdot b^2 \cdot c^3 + 16 \cdot a^2 \cdot c^4) \\
& \cdot d) \cdot x^3 + (b^5 + 16 \cdot a \cdot b^3 \cdot c + 16 \cdot a^2 \cdot b \cdot c^2) \cdot d^2 + 3 \cdot (a \cdot b^5 \cdot c + 4 \\
& \cdot a^2 \cdot b^3 \cdot c^2 - 32 \cdot b \cdot c^3 \cdot d^3 + 12 \cdot (b^3 \cdot c^2 + 4 \cdot a \cdot b \cdot c^3) \cdot d^2 - (b^5 \\
& \cdot c + 16 \cdot a \cdot b^3 \cdot c^2 + 16 \cdot a^2 \cdot b \cdot c^3) \cdot d) \cdot x^2 - 3 \cdot (a \cdot b^5 + 4 \cdot a^2 \cdot b^3 \cdot c \\
& \cdot d + (a \cdot b^6 + 8 \cdot a^2 \cdot b^4 \cdot c - 8 \cdot (5 \cdot b^2 \cdot c^2 + 4 \cdot a \cdot c^3) \cdot d^3 + 2 \cdot (7 \cdot b \\
& \cdot a^4 \cdot c + 40 \cdot a \cdot b^2 \cdot c^2 + 16 \cdot a^2 \cdot c^3) \cdot d^2 - (b^6 + 22 \cdot a \cdot b^4 \cdot c + 40 \cdot a^2 \\
& \cdot b^2 \cdot c^2) \cdot d) \cdot x) \cdot \sqrt{(c \cdot x^2 + b \cdot x + a)} / (c^2 \cdot x^4 + 2 \cdot b \cdot c \cdot x^3 + 2 \cdot \\
& b \cdot d \cdot x + (b^2 + 2 \cdot c \cdot d) \cdot x^2 + d^2)) / ((a^3 \cdot b^6 \cdot d^3 + 64 \cdot c^3 \cdot d^9 - 4 \\
& 8 \cdot (b^2 \cdot c^2 + 4 \cdot a \cdot c^3) \cdot d^8 + 12 \cdot (b^4 \cdot c + 12 \cdot a \cdot b^2 \cdot c^2 + 16 \cdot a^2 \cdot c^3) \\
& \cdot d^7 - (b^6 + 36 \cdot a \cdot b^4 \cdot c + 144 \cdot a^2 \cdot b^2 \cdot c^2 + 64 \cdot a^3 \cdot c^3) \cdot d^6 + (\\
& a^3 \cdot b^6 \cdot c^3 + 64 \cdot c^6 \cdot d^6 - 48 \cdot (b^2 \cdot c^5 + 4 \cdot a \cdot c^6) \cdot d^5 + 12 \cdot (b^4 \cdot c \\
& \cdot d^4 + 12 \cdot a \cdot b^2 \cdot c^5 + 16 \cdot a^2 \cdot c^6) \cdot d^4 - (b^6 \cdot c^3 + 36 \cdot a \cdot b^4 \cdot c^4 + 1 \\
& 44 \cdot a^2 \cdot b^2 \cdot c^5 + 64 \cdot a^3 \cdot c^6) \cdot d^3 + 3 \cdot (a \cdot b^6 \cdot c^3 + 12 \cdot a^2 \cdot b^4 \cdot c^4 \\
& + 16 \cdot a^3 \cdot b^2 \cdot c^5) \cdot d^2 - 3 \cdot (a^2 \cdot b^6 \cdot c^3 + 4 \cdot a^3 \cdot b^4 \cdot c^4) \cdot d) \cdot x^6 + \\
& 3 \cdot (a \cdot b^6 + 12 \cdot a^2 \cdot b^4 \cdot c + 16 \cdot a^3 \cdot b^2 \cdot c^2) \cdot d^5 + 3 \cdot (a^3 \cdot b^7 \cdot c^2 + \\
& 64 \cdot b \cdot c^5 \cdot d^6 - 48 \cdot (b^3 \cdot c^4 + 4 \cdot a \cdot b \cdot c^5) \cdot d^5 + 12 \cdot (b^5 \cdot c^3 + 12 \cdot a \cdot \\
& b^3 \cdot c^4 + 16 \cdot a^2 \cdot b \cdot c^5) \cdot d^4 - (b^7 \cdot c^2 + 36 \cdot a \cdot b^5 \cdot c^3 + 144 \cdot a^2 \cdot b \\
& \cdot a^3 \cdot c^4 + 64 \cdot a^3 \cdot b \cdot c^5) \cdot d^3 + 3 \cdot (a \cdot b^7 \cdot c^2 + 12 \cdot a^2 \cdot b^5 \cdot c^3 + 16 \cdot a \\
& \cdot a^3 \cdot b^3 \cdot c^4) \cdot d^2 - 3 \cdot (a^2 \cdot b^7 \cdot c^2 + 4 \cdot a^3 \cdot b^5 \cdot c^3) \cdot d) \cdot x^5 - 3 \cdot (a^2 \\
& \cdot b^6 + 4 \cdot a^3 \cdot b^4 \cdot c) \cdot d^4 + 3 \cdot (a^3 \cdot b^8 \cdot c + 64 \cdot c^5 \cdot d^7 + 16 \cdot (b^2 \cdot c^4 \\
& - 12 \cdot a \cdot c^5) \cdot d^6 - 12 \cdot (3 \cdot b^4 \cdot c^3 + 4 \cdot a \cdot b^2 \cdot c^4 - 16 \cdot a^2 \cdot c^5) \cdot d^5 \\
& + (11 \cdot b^6 \cdot c^2 + 108 \cdot a \cdot b^4 \cdot c^3 + 48 \cdot a^2 \cdot b^2 \cdot c^4 - 64 \cdot a^3 \cdot c^5) \cdot d^4 \\
& - (b^8 \cdot c + 33 \cdot a \cdot b^6 \cdot c^2 + 108 \cdot a^2 \cdot b^4 \cdot c^3 + 16 \cdot a^3 \cdot b^2 \cdot c^4) \cdot d^3 + \\
& 3 \cdot (a \cdot b^8 \cdot c + 11 \cdot a^2 \cdot b^6 \cdot c^2 + 12 \cdot a^3 \cdot b^4 \cdot c^3) \cdot d^2 - (3 \cdot a^2 \cdot b^8 \cdot c
\end{aligned}$$

$$\begin{aligned}
& + 11*a^3*b^6*c^2)*d)*x^4 + (a^3*b^9 + 384*b*c^4*d^7 - 32*(7*b^3*c^3 + 36*a*b*c^4)*d^6 + 24*(b^5*c^2 + 28*a*b^3*c^3 + 48*a^2*b*c^4)*d^5 + 6*(b^7*c - 12*a*b^5*c^2 - 112*a^2*b^3*c^3 - 64*a^3*b*c^4)*d^4 - (b^9 + 18*a*b^7*c - 72*a^2*b^5*c^2 - 224*a^3*b^3*c^3)*d^3 + 3*(a*b^9 + 6*a^2*b^7*c - 8*a^3*b^5*c^2)*d^2 - 3*(a^2*b^9 + 2*a^3*b^7*c)*d)*x^3 + 3*(a^3*b^8*d + 64*c^4*d^8 + 16*(b^2*c^3 - 12*a*c^4)*d^7 - 12*(3*b^4*c^2 + 4*a*b^2*c^3 - 16*a^2*c^4)*d^6 + (11*b^6*c + 108*a*b^4*c^2 + 48*a^2*b^2*c^3 - 64*a^3*c^4)*d^5 - (b^8 + 33*a*b^6*c + 108*a^2*b^4*c^2 + 16*a^3*b^2*c^3)*d^4 + 3*(a*b^8 + 11*a^2*b^6*c + 12*a^3*b^4*c^2)*d^3 - (3*a^2*b^8 + 11*a^3*b^6*c)*d^2)*x^2 + 3*(a^3*b^7*d^2 + 64*b*c^3*d^8 - 48*(b^3*c^2 + 4*a*b*c^3)*d^7 + 12*(b^5*c + 12*a*b^3*c^2 + 16*a^2*b*c^3)*d^6 - (b^7 + 36*a*b^5*c + 144*a^2*b^3*c^2 + 64*a^3*b*c^3)*d^5 + 3*(a*b^7 + 12*a^2*b^5*c + 16*a^3*b^3*c^2)*d^4 - 3*(a^2*b^7 + 4*a^3*b^5*c)*d^3)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d), -1/48*(2*(8*a^2*b^5 + 1152*b*c^2*d^4 + 2*(15*b^4*c^3 + 56*a*b^2*c^4 + 240*a^2*c^5 + 704*c^5*d^2 - 176*(b^2*c^4 + 4*a*c^5)*d)*x^5 + 5*(15*b^5*c^2 + 56*a*b^3*c^3 + 240*a^2*b*c^4 + 704*b*c^4*d^2 - 176*(b^3*c^3 + 4*a*b*c^4)*d)*x^4 - 360*(b^3*c + 4*a*b*c^2)*d^3 + 4*(15*b^6*c + 51*a*b^4*c^2 + 220*a^2*b^2*c^3 + 864*c^4*d^3 + 4*(117*b^2*c^3 - 236*a*c^4)*d^2 - 4*(39*b^4*c^2 + 142*a*b^2*c^3 - 80*a^2*c^4)*d)*x^3 + (33*b^5 + 344*a*b^3*c + 528*a^2*b*c^2)*d^2 + (15*b^7 + 26*a*b^5*c + 120*a^2*b^3*c^2 + 5184*b*c^3*d^3 - 8*(89*b^3*c^2 + 708*a*b*c^3)*d^2 - 8*(7*b^5*c - 14*a*b^3*c^2 - 240*a^2*b*c^3)*d)*x^2 - 26*(a*b^5 + 4*a^2*b^3*c)*d - 2*(5*a*b^6 + 12*a^2*b^4*c - 1152*c^3*d^4 - 72*(7*b^2*c^2 - 20*a*c^3)*d^3 + (203*b^4*c + 600*a*b^2*c^2 - 528*a^2*c^3)*d^2 - 2*(10*b^6 + 55*a*b^4*c + 108*a^2*b^2*c^2)*d)*x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)*sqrt(c*x^2 + b*x + a) - 3*(1024*c^3*d^6 - (5*b^6*c^3 + 12*a*b^4*c^4 + 48*a^2*b^2*c^5 + 320*a^3*c^6 - 1024*c^6*d^3 + 384*(b^2*c^5 + 4*a*c^6)*d^2 - 24*(3*b^4*c^4 + 8*a*b^2*c^5 + 48*a^2*c^6)*d)*x^6 - 384*(b^2*c^2 + 4*a*c^3)*d^5 - 3*(5*b^7*c^2 + 12*a*b^5*c^3 + 48*a^2*b^3*c^4 + 320*a^3*b*c^5 - 1024*b*c^5*d^3 + 384*(b^3*c^4 + 4*a*b*c^5)*d^2 - 24*(3*b^5*c^3 + 8*a*b^3*c^4 + 48*a^2*b*c^5)*d)*x^5 + 24*(3*b^4*c + 8*a*b^2*c^2 + 48*a^2*c^3)*d^4 - 3*(5*b^8*c + 12*a*b^6*c^2 + 48*a^2*b^4*c^3 + 320*a^3*b^2*c^4 - 1024*c^5*d^4 - 128*(5*b^2*c^4 - 12*a*c^5)*d^3 + 24*(13*b^4*c^3 + 56*a*b^2*c^4 - 48*a^2*c^5)*d^2 - (67*b^6*c^2 + 180*a*b^4*c^3 + 1104*a^2*b^2*c^4 - 320*a^3*c^5)*d)*x^4 - (5*b^6 + 12*a*b^4*c + 48*a^2*b^2*c^2 + 320*a^3*c^3)*d^3 - (5*b^9 + 12*a*b^7*c + 48*a^2*b^5*c^2 + 320*a^3*b^3*c^3 - 6144*b*c^4*d^4 + 256*(5*b^3*c^3 + 36*a*b*c^4)*d^3 - 48*(b^5*c^2 - 8*a*b^3*c^3 + 144*a^2*b*c^4)*d^2 - 6*(7*b^7*c + 20*a*b^5*c^2 + 144*a^2*b^3*c^3 - 320*a^3*b*c^4)*d)*x^3 + 3*(1024*c^4*d^5 + 128*(5*b^2*c^3 - 12*a*c^4)*d^4 - 24*(13*b^4*c^2 + 56*a*b^2*c^3 - 48*a^2*c^4)*d^3 + (67*b^6*c + 180*a*b^4*c^2 + 1104*a^2*b^2*c^3 - 320*a^3*c^4)*d^2 - (5*b^8 + 12*a*b^6*c + 48*a^2*b^4*c^2 + 320*a^3*b^2*c^3)*d)*x^2 + 3*(1024*b*c^3*d^5 - 384*(b^3*c^2 + 4*a*b*c^3)*d^4 + 24*(3*b^5*c + 8*a*b^3*c^2 + 48*a^2*b*c^3)*d^3 - (5*b^7 + 12*a*b^5*c + 48*a^2*b^3*c^2 + 320*a^3*b*c^3)*d^2)*x)*arctan(-1/2*(2*a*b^2 + (b^2*c + 4*a*c^2 - 8*c^2*d)*x^2 - (b^2 + 4*a*c)*d + (b^3 + 4*a*b*c - 8*b*c*d)*x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)/((a*b^3 + 4*b*c*d^2 - (b^3 + 4*a*b*c)*d + 2*(a*b^2*c + 4*c^2*d^2 - (b^2*c + 4*a*c^2)*d)*x)*sqrt(c*x^2 + b*x + a)))/((a^3*b^6*d^3 + 64*c^3*d^9 - 48*(b^2*c^2 + 4*a*c^3)*d^8 + 12*(b^4*c + 12*a*b^2*c^2 + 16*a^2*c^3)*d^7 - (b^6 + 3
\end{aligned}$$

$$\begin{aligned}
& 6*a*b^4*c + 144*a^2*b^2*c^2 + 64*a^3*c^3)*d^6 + (a^3*b^6*c^3 + 64* \\
& *c^6*d^6 - 48*(b^2*c^5 + 4*a*c^6)*d^5 + 12*(b^4*c^4 + 12*a*b^2*c^5 \\
& 5 + 16*a^2*c^6)*d^4 - (b^6*c^3 + 36*a*b^4*c^4 + 144*a^2*b^2*c^5 + \\
& 64*a^3*c^6)*d^3 + 3*(a*b^6*c^3 + 12*a^2*b^4*c^4 + 16*a^3*b^2*c^5 \\
&)*d^2 - 3*(a^2*b^6*c^3 + 4*a^3*b^4*c^4)*d)*x^6 + 3*(a*b^6 + 12*a^2 \\
& *b^4*c + 16*a^3*b^2*c^2)*d^5 + 3*(a^3*b^7*c^2 + 64*b*c^5*d^6 - 4 \\
& 8*(b^3*c^4 + 4*a*b*c^5)*d^5 + 12*(b^5*c^3 + 12*a*b^3*c^4 + 16*a^2 \\
& *b*c^5)*d^4 - (b^7*c^2 + 36*a*b^5*c^3 + 144*a^2*b^3*c^4 + 64*a^3* \\
& b*c^5)*d^3 + 3*(a*b^7*c^2 + 12*a^2*b^5*c^3 + 16*a^3*b^3*c^4)*d^2 \\
& - 3*(a^2*b^7*c^2 + 4*a^3*b^5*c^3)*d)*x^5 - 3*(a^2*b^6 + 4*a^3*b^4 \\
& *c)*d^4 + 3*(a^3*b^8*c + 64*c^5*d^7 + 16*(b^2*c^4 - 12*a*c^5)*d^6 \\
& - 12*(3*b^4*c^3 + 4*a*b^2*c^4 - 16*a^2*c^5)*d^5 + (11*b^6*c^2 + \\
& 108*a*b^4*c^3 + 48*a^2*b^2*c^4 - 64*a^3*c^5)*d^4 - (b^8*c + 33*a* \\
& b^6*c^2 + 108*a^2*b^4*c^3 + 16*a^3*b^2*c^4)*d^3 + 3*(a*b^8*c + 11 \\
& *a^2*b^6*c^2 + 12*a^3*b^4*c^3)*d^2 - (3*a^2*b^8*c + 11*a^3*b^6*c^2 \\
&)*d)*x^4 + (a^3*b^9 + 384*b*c^4*d^7 - 32*(7*b^3*c^3 + 36*a*b*c^4 \\
&))*d^6 + 24*(b^5*c^2 + 28*a*b^3*c^3 + 48*a^2*b*c^4)*d^5 + 6*(b^7*c \\
& - 12*a*b^5*c^2 - 112*a^2*b^3*c^3 - 64*a^3*b*c^4)*d^4 - (b^9 + 18 \\
& *a*b^7*c - 72*a^2*b^5*c^2 - 224*a^3*b^3*c^3)*d^3 + 3*(a*b^9 + 6*a \\
& ^2*b^7*c - 8*a^3*b^5*c^2)*d^2 - 3*(a^2*b^9 + 2*a^3*b^7*c)*d)*x^3 \\
& + 3*(a^3*b^8*d + 64*c^4*d^8 + 16*(b^2*c^3 - 12*a*c^4)*d^7 - 12*(3 \\
& *b^4*c^2 + 4*a*b^2*c^3 - 16*a^2*c^4)*d^6 + (11*b^6*c + 108*a*b^4* \\
& c^2 + 48*a^2*b^2*c^3 - 64*a^3*c^4)*d^5 - (b^8 + 33*a*b^6*c + 108* \\
& a^2*b^4*c^2 + 16*a^3*b^2*c^3)*d^4 + 3*(a*b^8 + 11*a^2*b^6*c + 12* \\
& a^3*b^4*c^2)*d^3 - (3*a^2*b^8 + 11*a^3*b^6*c)*d^2)*x^2 + 3*(a^3*b \\
& ^7*d^2 + 64*b*c^3*d^8 - 48*(b^3*c^2 + 4*a*b*c^3)*d^7 + 12*(b^5*c \\
& + 12*a*b^3*c^2 + 16*a^2*b*c^3)*d^6 - (b^7 + 36*a*b^5*c + 144*a^2* \\
& b^3*c^2 + 64*a^3*b*c^3)*d^5 + 3*(a*b^7 + 12*a^2*b^5*c + 16*a^3*b^3 \\
& *c^2)*d^4 - 3*(a^2*b^7 + 4*a^3*b^5*c)*d^3)*x)*sqrt(-a*b^2 - 4*c* \\
& d^2 + (b^2 + 4*a*c)*d)]
\end{aligned}$$

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/(c*x**2+b*x+d)**4/(c*x**2+b*x+a)**(1/2),x)

[Out] Timed out

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

$$3.7 \quad \int \frac{1}{\sqrt{d+ex+fx^2}(ae+bex+bf x^2)^2} dx$$

Optimal. Leaf size=162

$$\frac{(8aef - b(4df + e^2)) \tanh^{-1}\left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(bd-ae)^{3/2}(be-4af)^{3/2}} - \frac{b(e+2fx)\sqrt{d+ex+fx^2}}{e(bd-ae)(be-4af)(ae+bex+bf x^2)}$$

[Out] $-\left(\frac{(b(e+2fx)\sqrt{d+ex+fx^2})}{(e(bd-ae)(be-4af)(ae+bex+bf x^2))} - \left(\frac{(8aef - b(4df + e^2)) \operatorname{ArcTanh}\left(\frac{\sqrt{bd-ae}(e+2fx)}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(bd-ae)^{3/2}(be-4af)^{3/2}}\right)\right)$

Rubi [A] time = 0.685318, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$\frac{(8aef - b(4df + e^2)) \tanh^{-1}\left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(bd-ae)^{3/2}(be-4af)^{3/2}} - \frac{b(e+2fx)\sqrt{d+ex+fx^2}}{e(bd-ae)(be-4af)(ae+bex+bf x^2)}$$

Antiderivative was successfully verified.

[In] $\text{Int}\left[1/\left(\sqrt{d+ex+fx^2}\right)\left(ae+bex+bf x^2\right)^2, x\right]$

[Out] $-\left(\frac{(b(e+2fx)\sqrt{d+ex+fx^2})}{(e(bd-ae)(be-4af)(ae+bex+bf x^2))} - \left(\frac{(8aef - b(4df + e^2)) \operatorname{ArcTanh}\left(\frac{\sqrt{bd-ae}(e+2fx)}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(bd-ae)^{3/2}(be-4af)^{3/2}}\right)\right)$

Rubi in Sympy [A] time = 134.701, size = 150, normalized size = 0.93

$$\frac{b(e+2fx)\sqrt{d+ex+fx^2}}{e(ae-bd)(4af-be)(ae+bex+bf x^2)} - \frac{(-8aef + 4bdf + be^2) \operatorname{atanh}\left(\frac{(e+2fx)\sqrt{ae-bd}}{\sqrt{e}\sqrt{4af-be}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(ae-bd)^{3/2}(4af-be)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{rubi_integrate}\left(1/\left(b^2 f^2 x^2 + b^2 e^2 x + a^2 e\right)^2 / \left(f^2 x^2 + e^2 x + d\right)^{1/2}, x\right)$

```
[Out] -b*(e + 2*f*x)*sqrt(d + e*x + f*x**2)/(e*(a*e - b*d)*(4*a*f - b*e)
)*(a*e + b*e*x + b*f*x**2) - (-8*a*e*f + 4*b*d*f + b*e**2)*atanh
((e + 2*f*x)*sqrt(a*e - b*d)/(sqrt(e)*sqrt(4*a*f - b*e)*sqrt(d +
e*x + f*x**2)))/(e**(3/2)*(a*e - b*d)**(3/2)*(4*a*f - b*e)**(3/2)
)
```

Mathematica [B] time = 1.14257, size = 463, normalized size = 2.86

$$\frac{(b(4df + e^2) - 8aef)(ae + bx(e + fx)) \log\left(b(e + 2fx) - \sqrt{b}\sqrt{e}\sqrt{be - 4af}\right) - (b(4df + e^2) - 8aef)(ae + bx(e + fx))}{1}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[d + e*x + f*x^2]*(a*e + b*e*x + b*f*x^2)^2),x]
```

```
[Out] -(2*b*Sqrt[e]*Sqrt[b*d - a*e]*Sqrt[b*e - 4*a*f]*(e + 2*f*x)*Sqrt[
d + x*(e + f*x)] + (-8*a*e*f + b*(e^2 + 4*d*f))*(a*e + b*x*(e + f
*x))*Log[-(Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]) + b*(e + 2*f*x)] -
(-8*a*e*f + b*(e^2 + 4*d*f))*(a*e + b*x*(e + f*x))*Log[Sqrt[b]*Sq
rt[e]*Sqrt[b*e - 4*a*f] + b*(e + 2*f*x)] + (-8*a*e*f + b*(e^2 + 4
*d*f))*(a*e + b*x*(e + f*x))*Log[Sqrt[b]*(e^(3/2)*Sqrt[b*e - 4*a
*f] + Sqrt[b]*(e^2 - 4*d*f) + 2*Sqrt[e]*f*Sqrt[b*e - 4*a*f]*x - 4*
Sqrt[b*d - a*e]*f*Sqrt[d + x*(e + f*x)])] - (-8*a*e*f + b*(e^2 +
4*d*f))*(a*e + b*x*(e + f*x))*Log[Sqrt[b]*(e^(3/2)*Sqrt[b*e - 4*a
*f] - Sqrt[b]*(e^2 - 4*d*f) + 2*Sqrt[e]*f*Sqrt[b*e - 4*a*f]*x + 4
*Sqrt[b*d - a*e]*f*Sqrt[d + x*(e + f*x)])]/(2*e^(3/2)*(b*d - a*e
)^(3/2)*(b*e - 4*a*f)^(3/2)*(a*e + b*x*(e + f*x)))
```

Maple [B] time = 0.049, size = 1377, normalized size = 8.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(b*f*x^2+b*e*x+a*e)^2/(f*x^2+e*x+d)^(1/2),x)
```

```
[Out] -1/e/(4*a*f-b*e)/(a*e-b*d)/(x+1/2*e/f-1/2/b/f*(-b*e*(4*a*f-b*e))^
(1/2))*((x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2))/b/f)^2*f+(-b*e*(4*
a*f-b*e))^(1/2)/b*(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2))/b/f)-1/b
*(a*e-b*d))^(1/2)+1/2/b/e/(4*a*f-b*e)*(-b*e*(4*a*f-b*e))^(1/2)/(a
*e-b*d)/(-1/b*(a*e-b*d))^(1/2)*ln((-2/b*(a*e-b*d)+(-b*e*(4*a*f-b*
e))^(1/2)/b*(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2))/b/f)+2*(-1/b*(
a*e-b*d))^(1/2))*((x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2))/b/f)^2*f+
(-b*e*(4*a*f-b*e))^(1/2)/b*(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^(1/2)))
```

$$\begin{aligned} & /b/f)-1/b*(a*e-b*d))^{(1/2)})/(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^{(1/2)} \\ &)/b/f))-1/e/(4*a*f-b*e)/(a*e-b*d)/(x+1/2*e/f+1/2/b/f*(-b*e*(4*a*f \\ & -b*e))^{(1/2)})*((x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f)^{2*f-(-b \\ & *e*(4*a*f-b*e))^{(1/2)}/b*(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f \\ &)-1/b*(a*e-b*d))^{(1/2)}-1/2/b/e/(4*a*f-b*e)*(-b*e*(4*a*f-b*e))^{(1/2)} \\ &)/(a*e-b*d)/(-1/b*(a*e-b*d))^{(1/2)}*\ln((-2/b*(a*e-b*d)-(-b*e*(4*a \\ & *f-b*e))^{(1/2)}/b*(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f)+2*(-1 \\ & /b*(a*e-b*d))^{(1/2)}*((x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f)^{2 \\ & *f-(-b*e*(4*a*f-b*e))^{(1/2)}/b*(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1/2)} \\ &))/b/f)-1/b*(a*e-b*d))^{(1/2)})/(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1/2)} \\ &))/b/f))-2/e/(4*a*f-b*e)*f/(-b*e*(4*a*f-b*e))^{(1/2)}/(-1/b*(a*e-b* \\ & d))^{(1/2)}*\ln((-2/b*(a*e-b*d)+(-b*e*(4*a*f-b*e))^{(1/2)}/b*(x-1/2*(- \\ & b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f)+2*(-1/b*(a*e-b*d))^{(1/2)}*((x-1 \\ & /2*(-b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f)^{2*f+(-b*e*(4*a*f-b*e))^{(1 \\ & /2)}/b*(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f)-1/b*(a*e-b*d))^{(1 \\ & /2)})/(x-1/2*(-b*e+(-b*e*(4*a*f-b*e))^{(1/2)})/b/f))+2/e/(4*a*f-b* \\ & e)*f/(-b*e*(4*a*f-b*e))^{(1/2)}/(-1/b*(a*e-b*d))^{(1/2)}*\ln((-2/b*(a \\ & e-b*d)-(-b*e*(4*a*f-b*e))^{(1/2)}/b*(x+1/2*(b*e+(-b*e*(4*a*f-b*e))^{(1 \\ & /2)})/b/f)+2*(-1/b*(a*e-b*d))^{(1/2)}*((x+1/2*(b*e+(-b*e*(4*a*f-b* \\ & e))^{(1/2)})/b/f)^{2*f-(-b*e*(4*a*f-b*e))^{(1/2)}/b*(x+1/2*(b*e+(-b*e \\ & (4*a*f-b*e))^{(1/2)})/b/f)-1/b*(a*e-b*d))^{(1/2)})/(x+1/2*(b*e+(-b*e \\ & (4*a*f-b*e))^{(1/2)})/b/f)) \end{aligned}$$

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

$$\int \frac{1}{(bfx^2 + bex + ae)^2 \sqrt{fx^2 + ex + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)),x, algorithm="maxim

[Out] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)), x)

Fricas [A] time = 1.00522, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)),x, algorithm="frica

[Out] [-1/4*(4*sqrt(b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2*e^2)*f)*(2*b*f*x + b*e)*sqrt(f*x^2 + e*x + d) + (a*b*e^3 + (b^2*e^2*f + 4*(b^2*d - 2*a*b*e)*f^2)*x^2 + 4*(a*b*d*e - 2*a^2*e^2)*f + (b^2*e^3 +

$$4*(b^2*d*e - 2*a*b*e^2)*f)*x)*\log(((8*b^2*d^2*e^4 - 8*a*b*d*e^5 + a^2*e^6 + 16*a^2*d^2*e^2*f^2 + (b^2*e^4*f^2 + 16*(b^2*d^2 - 8*a*b*d*e + 8*a^2*e^2)*f^4 + 8*(3*b^2*d*e^2 - 4*a*b*e^3)*f^3)*x^4 + 2*(b^2*e^5*f + 16*(b^2*d^2*e - 8*a*b*d*e^2 + 8*a^2*e^3)*f^3 + 8*(3*b^2*d*e^3 - 4*a*b*e^4)*f^2)*x^3 + (b^2*e^6 - 32*(3*a*b*d^2*e - 4*a^2*d*e^2)*f^3 + 16*(3*b^2*d^2*e^2 - 13*a*b*d*e^3 + 10*a^2*e^4)*f^2 + 2*(16*b^2*d*e^4 - 19*a*b*e^5)*f)*x^2 - 8*(4*a*b*d^2*e^3 - 3*a^2*d*e^4)*f + 2*(4*b^2*d*e^5 - 3*a*b*e^6 - 16*(3*a*b*d^2*e^2 - 4*a^2*d*e^3)*f^2 + 8*(2*b^2*d^2*e^3 - 5*a*b*d*e^4 + 2*a^2*e^5)*f)*x)*\sqrt{(b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2*e^2)*f) - 4*(2*b^3*d^2*e^5 - 3*a*b^2*d*e^6 + a^2*b*e^7 - 2*(16*(a*b^2*d^2*e - 3*a^2*b*d*e^2 + 2*a^3*e^3)*f^4 - 4*(b^3*d^2*e^2 - 4*a*b^2*d*e^3 + 3*a^2*b*e^4)*f^3 - (b^3*d*e^4 - a*b^2*e^5)*f^2)*x^3 + 16*(a^2*b*d^2*e^3 - a^3*d*e^4)*f^2 - 3*(16*(a*b^2*d^2*e^2 - 3*a^2*b*d*e^3 + 2*a^3*e^4)*f^3 - 4*(b^3*d^2*e^3 - 4*a*b^2*d*e^4 + 3*a^2*b*e^5)*f^2 - (b^3*d*e^5 - a*b^2*e^6)*f)*x^2 - 4*(3*a*b^2*d^2*e^4 - 4*a^2*b*d*e^5 + a^3*e^6)*f + (b^3*d*e^6 - a*b^2*e^7 + 32*(a^2*b*d^2*e^2 - a^3*d*e^3)*f^3 - 40*(a*b^2*d^2*e^3 - 2*a^2*b*d*e^4 + a^3*e^5)*f^2 + 2*(4*b^3*d^2*e^4 - 11*a*b^2*d*e^5 + 7*a^2*b*e^6)*f)*x)*\sqrt{(f*x^2 + e*x + d)/(b^2*f^2*x^4 + 2*b^2*e*f*x^3 + 2*a*b*e^2*x + a^2*e^2 + (b^2*e^2 + 2*a*b*e*f)*x^2)))/((a*b^2*d*e^3 - a^2*b*e^4 - (4*(a*b^2*d*e - a^2*b*e^2)*f^2 - (b^3*d*e^2 - a*b^2*e^3)*f)*x^2 - 4*(a^2*b*d*e^2 - a^3*e^3)*f + (b^3*d*e^3 - a*b^2*e^4 - 4*(a*b^2*d*e^2 - a^2*b*e^3)*f)*x)*\sqrt{(b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2*e^2)*f)}, -1/2*(2*\sqrt{-b^2*d*e^2 + a*b*e^3 + 4*(a*b*d*e - a^2*e^2)*f}*(2*b*f*x + b*e)*\sqrt{(f*x^2 + e*x + d) + (a*b*e^3 + (b^2*e^2*f + 4*(b^2*d - 2*a*b*e)*f^2)*x^2 + 4*(a*b*d*e - 2*a^2*e^2)*f + (b^2*e^3 + 4*(b^2*d*e - 2*a*b*e^2)*f)*x)*\arctan(-1/2*\sqrt{-b^2*d*e^2 + a*b*e^3 + 4*(a*b*d*e - a^2*e^2)*f}*(2*b*d*e^2 - a*e^3 - 4*a*d*e*f + (b*e^2*f + 4*(b*d - 2*a*e)*f^2)*x^2 + (b*e^3 + 4*(b*d*e - 2*a*e^2)*f)*x)/((b^2*d*e^3 - a*b*e^4 - 4*(a*b*d*e^2 - a^2*e^3)*f - 2*(4*(a*b*d*e - a^2*e^2)*f^2 - (b^2*d*e^2 - a*b*e^3)*f)*x)*\sqrt{(f*x^2 + e*x + d)))/((a*b^2*d*e^3 - a^2*b*e^4 - (4*(a*b^2*d*e - a^2*b*e^2)*f^2 - (b^3*d*e^2 - a*b^2*e^3)*f)*x^2 - 4*(a^2*b*d*e^2 - a^3*e^3)*f + (b^3*d*e^3 - a*b^2*e^4 - 4*(a*b^2*d*e^2 - a^2*b*e^3)*f)*x)*\sqrt{-b^2*d*e^2 + a*b*e^3 + 4*(a*b*d*e - a^2*e^2)*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(1/(b*f*x**2+b*e*x+a*e)**2/(f*x**2+e*x+d)**(1/2),x)

[Out] Timed out

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)),x, algorithm="giac"
```

```
[Out] Exception raised: TypeError
```

$$3.8 \quad \int \frac{1}{(4+2x+x^2)\sqrt{5+2x+x^2}} dx$$

Optimal. Leaf size=28

$$\frac{\tan^{-1}\left(\frac{x+1}{\sqrt{3}\sqrt{x^2+2x+5}}\right)}{\sqrt{3}}$$

[Out] ArcTan[(1 + x)/(Sqrt[3]*Sqrt[5 + 2*x + x^2])]/Sqrt[3]

Rubi [A] time = 0.0449474, antiderivative size = 28, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.087$

$$\frac{\tan^{-1}\left(\frac{x+1}{\sqrt{3}\sqrt{x^2+2x+5}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

[In] Int[1/((4 + 2*x + x^2)*Sqrt[5 + 2*x + x^2]), x]

[Out] ArcTan[(1 + x)/(Sqrt[3]*Sqrt[5 + 2*x + x^2])]/Sqrt[3]

Rubi in Sympy [A] time = 15.435, size = 31, normalized size = 1.11

$$\frac{\sqrt{3} \operatorname{atan}\left(\frac{\sqrt{3}(2x+2)}{6\sqrt{x^2+2x+5}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(x**2+2*x+4)/(x**2+2*x+5)**(1/2), x)

[Out] sqrt(3)*atan(sqrt(3)*(2*x + 2)/(6*sqrt(x**2 + 2*x + 5)))/3

Mathematica [A] time = 0.0626008, size = 28, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{x+1}{\sqrt{3}\sqrt{x^2+2x+5}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((4 + 2*x + x^2)*Sqrt[5 + 2*x + x^2]),x]

[Out] ArcTan[(1 + x)/(Sqrt[3]*Sqrt[5 + 2*x + x^2])]/Sqrt[3]

Maple [A] time = 0.019, size = 27, normalized size = 1.

$$\frac{\sqrt{3}}{3} \arctan\left(\frac{\sqrt{3}(2x+2)}{6} \frac{1}{\sqrt{x^2+2x+5}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(x^2+2*x+4)/(x^2+2*x+5)^(1/2),x)

[Out] 1/3*3^(1/2)*arctan(1/6*3^(1/2)/(x^2+2*x+5)^(1/2)*(2*x+2))

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

$$\int \frac{1}{\sqrt{x^2+2x+5}(x^2+2x+4)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)),x, algorithm="maxima")

[Out] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)), x)

Fricas [A] time = 0.274123, size = 51, normalized size = 1.82

$$\frac{1}{3} \sqrt{3} \arctan\left(\frac{1}{3} \sqrt{3} \sqrt{x^2+2x+5}(x+1) - \frac{1}{3} \sqrt{3}(x^2+2x+4)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)),x, algorithm="fricas")

[Out] 1/3*sqrt(3)*arctan(1/3*sqrt(3)*sqrt(x^2 + 2*x + 5)*(x + 1) - 1/3*sqrt(3)*(x^2 + 2*x + 4))

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

$$\int \frac{1}{(x^2 + 2x + 4)\sqrt{x^2 + 2x + 5}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(x**2+2*x+4)/(x**2+2*x+5)**(1/2), x)

[Out] Integral(1/((x**2 + 2*x + 4)*sqrt(x**2 + 2*x + 5)), x)

GIAC/XCAS [A] time = 0.265977, size = 70, normalized size = 2.5

$$-\frac{1}{3}\sqrt{3}\arctan\left(-\frac{1}{3}\sqrt{3}\left(x - \sqrt{x^2 + 2x + 5} + 2\right)\right) + \frac{1}{3}\sqrt{3}\arctan\left(-\frac{1}{3}\sqrt{3}\left(x - \sqrt{x^2 + 2x + 5}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)), x, algorithm="giac")

[Out] -1/3*sqrt(3)*arctan(-1/3*sqrt(3)*(x - sqrt(x^2 + 2*x + 5) + 2)) + 1/3*sqrt(3)*arctan(-1/3*sqrt(3)*(x - sqrt(x^2 + 2*x + 5)))

$$3.9 \quad \int \left(a + \frac{ex}{2} + cx^2\right)^p (2a + ex + 2cx^2)^q dx$$

Optimal. Leaf size=136

$$\frac{2^{q+1} \left(\frac{-\sqrt{e^2-16ac+4cx+e}}{\sqrt{e^2-16ac}} \right)^{-p-q-1} (2a + 2cx^2 + ex)^{p+q+1} {}_2F_1 \left(-p-q, p+q+1; p+q+2; \frac{e+4cx+\sqrt{e^2-16ac}}{2\sqrt{e^2-16ac}} \right)}{(p+q+1)\sqrt{e^2-16ac}}$$

[Out] -((2^(1 + q) * ((e - Sqrt[-16*a*c + e^2] + 4*c*x)/Sqrt[-16*a*c + e^2]))^(-1 - p - q) * (2*a + e*x + 2*c*x^2)^(1 + p + q) * Hypergeometric2F1[-p - q, 1 + p + q, 2 + p + q, (e + Sqrt[-16*a*c + e^2] + 4*c*x)/(2*Sqrt[-16*a*c + e^2])]) / (Sqrt[-16*a*c + e^2] * (1 + p + q))

Rubi [A] time = 0.221949, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$\frac{2^{q+1} \left(\frac{-\sqrt{e^2-16ac+4cx+e}}{\sqrt{e^2-16ac}} \right)^{-p-q-1} (2a + 2cx^2 + ex)^{p+q+1} {}_2F_1 \left(-p-q, p+q+1; p+q+2; \frac{e+4cx+\sqrt{e^2-16ac}}{2\sqrt{e^2-16ac}} \right)}{(p+q+1)\sqrt{e^2-16ac}}$$

Antiderivative was successfully verified.

[In] Int[(a + (e*x)/2 + c*x^2)^p*(2*a + e*x + 2*c*x^2)^q, x]

[Out] -((2^(1 + q) * ((e - Sqrt[-16*a*c + e^2] + 4*c*x)/Sqrt[-16*a*c + e^2]))^(-1 - p - q) * (2*a + e*x + 2*c*x^2)^(1 + p + q) * Hypergeometric2F1[-p - q, 1 + p + q, 2 + p + q, (e + Sqrt[-16*a*c + e^2] + 4*c*x)/(2*Sqrt[-16*a*c + e^2])]) / (Sqrt[-16*a*c + e^2] * (1 + p + q))

Rubi in Sympy [A] time = 28.2806, size = 126, normalized size = 0.93

$$\frac{2^{-p} \left(\frac{-2cx - \frac{e}{2} + \frac{\sqrt{-16ac+e^2}}{2}}{\sqrt{-16ac+e^2}} \right)^{-p-q-1} (2a + 2cx^2 + ex)^{p+q+1} {}_2F_1 \left(-p-q, p+q+1; p+q+2; \frac{2cx + \frac{e}{2} + \frac{\sqrt{-16ac+e^2}}{2}}{\sqrt{-16ac+e^2}} \right)}{\sqrt{-16ac+e^2} (p+q+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((a+1/2*e*x+c*x**2)**p*(2*c*x**2+e*x+2*a)**q, x)

[Out] $-2^{**}(-p)^{**}((-2*c*x - e/2 + \text{sqrt}(-16*a*c + e^{**}2)/2)/\text{sqrt}(-16*a*c + e^{**}2))^{**}(-p - q - 1)^{**}(2*a + 2*c*x^{**}2 + e*x)^{**}(p + q + 1)^{**}\text{hyper}((-p - q, p + q + 1), (p + q + 2,), (2*c*x + e/2 + \text{sqrt}(-16*a*c + e^{**}2)/2)/\text{sqrt}(-16*a*c + e^{**}2))/(\text{sqrt}(-16*a*c + e^{**}2)^{**}(p + q + 1))$

Mathematica [A] time = 0.243209, size = 142, normalized size = 1.04

$$\frac{2^{q-2} \left(-\sqrt{e^2 - 16ac} + 4cx + e \right) \left(\frac{\sqrt{e^2 - 16ac} + 4cx + e}{\sqrt{e^2 - 16ac}} \right)^{-p-q} (2a + x(2cx + e))^{p+q} {}_2F_1 \left(-p - q, p + q + 1; p + q + 2; \frac{-e - 4cx + \sqrt{e^2 - 16ac}}{2\sqrt{e^2 - 16ac}} \right)}{c(p + q + 1)}$$

Antiderivative was successfully verified.

[In] Integrate[(a + (e*x)/2 + c*x^2)^p*(2*a + e*x + 2*c*x^2)^q,x]

[Out] $(2^{(-2 + q)} * (e - \text{Sqrt}[-16*a*c + e^2] + 4*c*x) * ((e + \text{Sqrt}[-16*a*c + e^2] + 4*c*x) / \text{Sqrt}[-16*a*c + e^2])^{(-p - q)} * (2*a + x*(e + 2*c*x))^{(p + q)} * \text{Hypergeometric2F1}[-p - q, 1 + p + q, 2 + p + q, (-e + \text{Sqrt}[-16*a*c + e^2] - 4*c*x) / (2*\text{Sqrt}[-16*a*c + e^2])]) / (c*(1 + p + q))$

Maple [F] time = 0.353, size = 0, normalized size = 0.

$$\int \left(a + \frac{ex}{2} + cx^2 \right)^p (2cx^2 + ex + 2a)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+1/2*e*x+c*x^2)^p*(2*c*x^2+e*x+2*a)^q,x)

[Out] int((a+1/2*e*x+c*x^2)^p*(2*c*x^2+e*x+2*a)^q,x)

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

$$\int (2cx^2 + ex + 2a)^q \left(cx^2 + \frac{1}{2}ex + a \right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p,x, algorithm="maxima")

[Out] `integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p, x)`

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

$$\text{integral}\left(\left(2cx^2 + ex + 2a\right)^q\left(cx^2 + \frac{1}{2}ex + a\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p,x, algorithm="fricas")`

[Out] `integral((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p, 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+1/2*e*x+c*x**2)**p*(2*c*x**2+e*x+2*a)**q,x)`

[Out] Timed out

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (2cx^2 + ex + 2a)^q \left(cx^2 + \frac{1}{2}ex + a\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p,x, algorithm="giac")`

[Out] `integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p, x)`

$$3.10 \quad \int \left(a + \frac{cex}{f} + cx^2 \right)^p \left(\frac{af}{c} + ex + fx^2 \right)^q dx$$

Optimal. Leaf size=200

$$\frac{\sqrt{c} 2^{p+q+1} \left(a + \frac{cex}{f} + cx^2 \right)^p \left(\frac{af}{c} + ex + fx^2 \right)^{q+1} \left(-\frac{\sqrt{c} \left(-\frac{\sqrt{ce^2-4af^2}}{\sqrt{c}} + e+2fx \right)}{\sqrt{ce^2-4af^2}} \right)^{-p-q-1} {}_2F_1 \left(-p-q, p+q+1; p+q+2; \frac{\sqrt{c} (e+2fx)}{2\sqrt{ce^2-4af^2}} \right)}{(p+q+1)\sqrt{ce^2-4af^2}}$$

[Out] -((2^(1 + p + q)*Sqrt[c]*(-(Sqrt[c]*(e - Sqrt[c*e^2 - 4*a*f^2])/Sqrt[c] + 2*f*x))/Sqrt[c*e^2 - 4*a*f^2]))^(-1 - p - q)*(a + (c*e*x)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^(1 + q)*Hypergeometric2F1[-p - q, 1 + p + q, 2 + p + q, (Sqrt[c]*(e + Sqrt[c*e^2 - 4*a*f^2])/Sqrt[c] + 2*f*x)/(2*Sqrt[c*e^2 - 4*a*f^2])]/(Sqrt[c*e^2 - 4*a*f^2])^(1 + p + q))

Rubi [A] time = 0.296575, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$\frac{\sqrt{c} 2^{p+q+1} \left(a + \frac{cex}{f} + cx^2 \right)^p \left(\frac{af}{c} + ex + fx^2 \right)^{q+1} \left(-\frac{\sqrt{c} \left(-\frac{\sqrt{ce^2-4af^2}}{\sqrt{c}} + e+2fx \right)}{\sqrt{ce^2-4af^2}} \right)^{-p-q-1} {}_2F_1 \left(-p-q, p+q+1; p+q+2; \frac{\sqrt{c} (e+2fx)}{2\sqrt{ce^2-4af^2}} \right)}{(p+q+1)\sqrt{ce^2-4af^2}}$$

Antiderivative was successfully verified.

[In] Int[(a + (c*e*x)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^q,x]

[Out] -((2^(1 + p + q)*Sqrt[c]*(-(Sqrt[c]*(e - Sqrt[c*e^2 - 4*a*f^2])/Sqrt[c] + 2*f*x))/Sqrt[c*e^2 - 4*a*f^2]))^(-1 - p - q)*(a + (c*e*x)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^(1 + q)*Hypergeometric2F1[-p - q, 1 + p + q, 2 + p + q, (Sqrt[c]*(e + Sqrt[c*e^2 - 4*a*f^2])/Sqrt[c] + 2*f*x)/(2*Sqrt[c*e^2 - 4*a*f^2])]/(Sqrt[c*e^2 - 4*a*f^2])^(1 + p + q))

Rubi in Sympy [A] time = 43.4744, size = 194, normalized size = 0.97

$$\frac{f \left(\frac{-\frac{\sqrt{ce}}{2} - \sqrt{cfx} + \frac{\sqrt{-4af^2+ce^2}}{2}}{\sqrt{-4af^2+ce^2}} \right)^{-p-q-1} \left(a + \frac{cex}{f} + cx^2 \right)^{-q} \left(a + \frac{cex}{f} + cx^2 \right)^{p+q+1} \left(\frac{af}{c} + ex + fx^2 \right)^q {}_2F_1 \left(-p-q, p+q+1; p+q+2; \frac{\frac{\sqrt{ce}}{2} + \sqrt{cfx}}{\sqrt{-4af^2+ce^2}} \right)}{\sqrt{c}\sqrt{-4af^2+ce^2}(p+q+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((a+c*e*x/f+c*x**2)**p*(a*f/c+e*x+f*x**2)**q,x)`

[Out]
$$-f \cdot \left(\frac{-\sqrt{c}e/2 - \sqrt{c}fx + \sqrt{-4af^2 + ce^2}}{2} \right) / \sqrt{-4af^2 + ce^2} \cdot (-p - q - 1) \cdot (a + cex/f + cx^2)^{-q} \cdot (a + cex/f + cx^2)^{p+q+1} \cdot (af/c + ex + fx^2)^q \cdot \text{hyper}((-p - q, p + q + 1), (p + q + 2,), (\sqrt{c}e/2 + \sqrt{c}fx + \sqrt{-4af^2 + ce^2})/2) / \sqrt{-4af^2 + ce^2} / (\sqrt{c} \sqrt{-4af^2 + ce^2} (p + q + 1))$$

Mathematica [A] time = 0.452786, size = 172, normalized size = 0.86

$$\frac{2^{p+q-1} \left(\sqrt{c}(e+2fx) - \sqrt{ce^2 - 4af^2} \right) \left(a + \frac{cx(e+fx)}{f} \right)^p \left(\frac{af}{c} + x(e+fx) \right)^q \left(\frac{\sqrt{c}(e+2fx)}{\sqrt{ce^2 - 4af^2}} + 1 \right)^{-p-q} {}_2F_1 \left(-p - q, p + q + 1; p + q \right)}{\sqrt{c}f(p + q + 1)}$$

Antiderivative was successfully verified.

[In] `Integrate[(a + (c*e*x)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^q,x]`

[Out]
$$(2^{(-1+p+q)} \cdot ((af)/c + x \cdot (e + fx))^q \cdot (a + (cx \cdot (e + fx))/f) \cdot (-\sqrt{c^2e^2 - 4af^2} + \sqrt{c} \cdot (e + 2fx)) \cdot (1 + (\sqrt{c} \cdot (e + 2fx))/\sqrt{c^2e^2 - 4af^2}))^{(-p-q)} \cdot \text{Hypergeometric2F1}[-p - q, 1 + p + q, 2 + p + q, 1/2 - (\sqrt{c} \cdot (e + 2fx))/(2\sqrt{c^2e^2 - 4af^2})]) / (\sqrt{c} \cdot f \cdot (1 + p + q))$$

Maple [F] time = 0.409, size = 0, normalized size = 0.

$$\int \left(a + \frac{cex}{f} + cx^2 \right)^p \left(\frac{fa}{c} + ex + fx^2 \right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((a+c*e*x/f+c*x^2)^p*(a*f/c+e*x+f*x^2)^q,x)`

[Out] `int((a+c*e*x/f+c*x^2)^p*(a*f/c+e*x+f*x^2)^q,x)`

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

$$\int \left(cx^2 + \frac{cex}{f} + a \right)^p \left(fx^2 + ex + \frac{af}{c} \right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q,x, algorithm="maxima")

[Out] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q, x)

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

$$\text{integral}\left(\left(\frac{cfx^2 + cex + af}{c}\right)^q \left(\frac{cfx^2 + cex + af}{f}\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q,x, algorithm="fricas")

[Out] integral(((c*f*x^2 + c*e*x + a*f)/c)^q*((c*f*x^2 + c*e*x + a*f)/f)^p, 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+c*e*x/f+c*x**2)**p*(a*f/c+e*x+f*x**2)**q,x)

[Out] Timed out

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(cx^2 + \frac{cex}{f} + a \right)^p \left(fx^2 + ex + \frac{af}{c} \right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q,x, algorithm="giac")
```

```
[Out] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q, x)
```

$$3.11 \quad \int \frac{\sqrt{1+2x+x^2}}{\sqrt{1+x^2}} dx$$

Optimal. Leaf size=48

$$\frac{\sqrt{x^2+1}\sqrt{x^2+2x+1}}{x+1} + \frac{\sqrt{x^2+2x+1} \sinh^{-1}(x)}{x+1}$$

[Out] (Sqrt[1 + x^2]*Sqrt[1 + 2*x + x^2])/(1 + x) + (Sqrt[1 + 2*x + x^2]*ArcSinh[x])/(1 + x)

Rubi [A] time = 0.0523703, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$

$$\frac{\sqrt{x^2+1}\sqrt{x^2+2x+1}}{x+1} + \frac{\sqrt{x^2+2x+1} \sinh^{-1}(x)}{x+1}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[1 + 2*x + x^2]/Sqrt[1 + x^2], x]

[Out] (Sqrt[1 + x^2]*Sqrt[1 + 2*x + x^2])/(1 + x) + (Sqrt[1 + 2*x + x^2]*ArcSinh[x])/(1 + x)

Rubi in Sympy [A] time = 11.459, size = 41, normalized size = 0.85

$$\frac{\sqrt{x^2+1}\sqrt{x^2+2x+1}}{x+1} + \frac{\sqrt{x^2+2x+1} \operatorname{asinh}(x)}{x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(((1+x)**2)**(1/2)/(x**2+1)**(1/2), x)

[Out] sqrt(x**2 + 1)*sqrt(x**2 + 2*x + 1)/(x + 1) + sqrt(x**2 + 2*x + 1)*asinh(x)/(x + 1)

Mathematica [A] time = 0.0266927, size = 27, normalized size = 0.56

$$\frac{\sqrt{(x+1)^2} \left(\sqrt{x^2+1} + \sinh^{-1}(x) \right)}{x+1}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[1 + 2*x + x^2]/Sqrt[1 + x^2],x]

[Out] (Sqrt[(1 + x)^2]*(Sqrt[1 + x^2] + ArcSinh[x]))/(1 + x)

Maple [C] time = 0.103, size = 16, normalized size = 0.3

$$\operatorname{csgn}(1+x) \left(\operatorname{Arcsinh}(x) + \sqrt{x^2+1} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(((1+x)^2)^(1/2)/(x^2+1)^(1/2),x)

[Out] csgn(1+x)*(arsinh(x)+(x^2+1)^(1/2))

Maxima [A] time = 0.783481, size = 14, normalized size = 0.29

$$\sqrt{x^2+1} + \operatorname{arsinh}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt((x + 1)^2)/sqrt(x^2 + 1),x, algorithm="maxima")

[Out] sqrt(x^2 + 1) + arcsinh(x)

Fricas [A] time = 0.2603, size = 73, normalized size = 1.52

$$-\frac{x^2 + (x - \sqrt{x^2+1}) \log(-x + \sqrt{x^2+1}) - \sqrt{x^2+1}x + 1}{x - \sqrt{x^2+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt((x + 1)^2)/sqrt(x^2 + 1),x, algorithm="fricas")

[Out] -(x^2 + (x - sqrt(x^2 + 1))*log(-x + sqrt(x^2 + 1)) - sqrt(x^2 + 1)*x + 1)/(x - sqrt(x^2 + 1))

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

$$\int \frac{\sqrt{(x+1)^2}}{\sqrt{x^2+1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(((1+x)**2)**(1/2)/(x**2+1)**(1/2),x)

[Out] Integral(sqrt((x + 1)**2)/sqrt(x**2 + 1), x)

GIAC/XCAS [A] time = 0.267339, size = 66, normalized size = 1.38

$$-\left(\sqrt{2} - \ln(\sqrt{2} + 1)\right) \operatorname{sign}(x + 1) - \ln(-x + \sqrt{x^2 + 1}) \operatorname{sign}(x + 1) + \sqrt{x^2 + 1} \operatorname{sign}(x + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt((x + 1)^2)/sqrt(x^2 + 1),x, algorithm="giac")

[Out] -(sqrt(2) - ln(sqrt(2) + 1))*sign(x + 1) - ln(-x + sqrt(x^2 + 1))
*sign(x + 1) + sqrt(x^2 + 1)*sign(x + 1)

$$3.12 \quad \int \frac{1}{(-1+x^2)^2 \sqrt{-1+x+x^2}} dx$$

Optimal. Leaf size=70

$$\frac{\sqrt{x^2+x-1}}{2(1-x^2)} - \frac{1}{8} \tan^{-1} \left(\frac{x+3}{2\sqrt{x^2+x-1}} \right) - \frac{5}{8} \tanh^{-1} \left(\frac{1-3x}{2\sqrt{x^2+x-1}} \right)$$

[Out] Sqrt[-1 + x + x^2]/(2*(1 - x^2)) - ArcTan[(3 + x)/(2*Sqrt[-1 + x + x^2])]/8 - (5*ArcTanh[(1 - 3*x)/(2*Sqrt[-1 + x + x^2])])/8

Rubi [A] time = 0.124569, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$

$$\frac{\sqrt{x^2+x-1}}{2(1-x^2)} - \frac{1}{8} \tan^{-1} \left(\frac{x+3}{2\sqrt{x^2+x-1}} \right) - \frac{5}{8} \tanh^{-1} \left(\frac{1-3x}{2\sqrt{x^2+x-1}} \right)$$

Antiderivative was successfully verified.

[In] Int[1/((-1 + x^2)^2*Sqrt[-1 + x + x^2]),x]

[Out] Sqrt[-1 + x + x^2]/(2*(1 - x^2)) - ArcTan[(3 + x)/(2*Sqrt[-1 + x + x^2])]/8 - (5*ArcTanh[(1 - 3*x)/(2*Sqrt[-1 + x + x^2])])/8

Rubi in Sympy [A] time = 22.1084, size = 60, normalized size = 0.86

$$-\frac{\operatorname{atan}\left(-\frac{-x-3}{2\sqrt{x^2+x-1}}\right)}{8} + \frac{5 \operatorname{atanh}\left(\frac{3x-1}{2\sqrt{x^2+x-1}}\right)}{8} + \frac{\sqrt{x^2+x-1}}{2(-x^2+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(x**2-1)**2/(x**2+x-1)**(1/2),x)

[Out] -atan(-(-x - 3)/(2*sqrt(x**2 + x - 1)))/8 + 5*atanh((3*x - 1)/(2*sqrt(x**2 + x - 1)))/8 + sqrt(x**2 + x - 1)/(2*(-x**2 + 1))

Mathematica [A] time = 0.0716154, size = 72, normalized size = 1.03

$$\frac{1}{8} \left(-\frac{4\sqrt{x^2+x-1}}{x^2-1} + 5 \log \left(-2\sqrt{x^2+x-1} - 3x + 1 \right) - \tan^{-1} \left(\frac{x+3}{2\sqrt{x^2+x-1}} \right) - 5 \log(1-x) \right)$$

Antiderivative was successfully verified.

[In] Integrate[1/((-1 + x^2)^2*Sqrt[-1 + x + x^2]),x]

[Out] ((-4*Sqrt[-1 + x + x^2])/(-1 + x^2) - ArcTan[(3 + x)/(2*Sqrt[-1 + x + x^2])]) - 5*Log[1 - x] + 5*Log[1 - 3*x - 2*Sqrt[-1 + x + x^2]])/8

Maple [A] time = 0.026, size = 84, normalized size = 1.2

$$\frac{1}{4+4x}\sqrt{(1+x)^2-2-x} + \frac{1}{8}\arctan\left(\frac{-3-x}{2}\frac{1}{\sqrt{(1+x)^2-2-x}}\right) - \frac{1}{-4+4x}\sqrt{(-1+x)^2+3x-2} + \frac{5}{8}\operatorname{Artanh}\left(\frac{-1+3x}{2}\frac{1}{\sqrt{(-1+x)^2+3x-2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(x^2-1)^2/(x^2+x-1)^(1/2),x)

[Out] 1/4/(1+x)*((1+x)^2-2-x)^(1/2)+1/8*arctan(1/2*(-3-x)/((1+x)^2-2-x)^(1/2))-1/4/(-1+x)*((-1+x)^2+3*x-2)^(1/2)+5/8*arctanh(1/2*(-1+3*x)/((-1+x)^2+3*x-2)^(1/2))

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

$$\int \frac{1}{\sqrt{x^2+x-1}(x^2-1)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2),x, algorithm="maxima")

[Out] integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2), x)

Fricas [A] time = 0.272794, size = 348, normalized size = 4.97

$32x^3 + 48x^2 + 2(8x^4 + 8x^3 - 11x^2 - 4(2x^3 + x^2 - 2x - 1)\sqrt{x^2 + x - 1} - 8x + 3)\arctan(-x + \sqrt{x^2 + x - 1} - 1) + 5(8$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2),x, algorithm="fricas")`

[Out] $\frac{1}{8} (32x^3 + 48x^2 + 2(8x^4 + 8x^3 - 11x^2 - 4(2x^3 + x^2 - 2x - 1)\sqrt{x^2 + x - 1}) - 8x + 3) \arctan(-x + \sqrt{x^2 + x - 1}) - 1) + 5(8x^4 + 8x^3 - 11x^2 - 4(2x^3 + x^2 - 2x - 1)\sqrt{x^2 + x - 1}) \log(-x + \sqrt{x^2 + x - 1}) + 2) - 5(8x^4 + 8x^3 - 11x^2 - 4(2x^3 + x^2 - 2x - 1)\sqrt{x^2 + x - 1}) \log(-x + \sqrt{x^2 + x - 1}) - 4(8x^2 + 8x - 3)\sqrt{x^2 + x - 1} - 16x - 16) / (8x^4 + 8x^3 - 11x^2 - 4(2x^3 + x^2 - 2x - 1)\sqrt{x^2 + x - 1}) - 8x + 3)$

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

$$\int \frac{1}{(x-1)^2 (x+1)^2 \sqrt{x^2+x-1}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(x**2-1)**2/(x**2+x-1)**(1/2),x)`

[Out] `Integral(1/((x - 1)**2*(x + 1)**2*sqrt(x**2 + x - 1)), x)`

GIAC/XCAS [A] time = 0.270882, size = 193, normalized size = 2.76

$$\frac{2(x - \sqrt{x^2 + x - 1})^3 + 3(x - \sqrt{x^2 + x - 1})^2 - x + \sqrt{x^2 + x - 1} - 1}{2\left(\left(x - \sqrt{x^2 + x - 1}\right)^4 - 2\left(x - \sqrt{x^2 + x - 1}\right)^2 - 4x + 4\sqrt{x^2 + x - 1}\right)} + \frac{1}{4} \arctan\left(-x + \sqrt{x^2 + x - 1} - 1\right) + \frac{5}{8} \ln\left(\left|-x + \sqrt{x^2 + x - 1} + 2\right|\right) - \frac{5}{8} \ln\left(\left|-x + \sqrt{x^2 + x - 1}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2),x, algorithm="giac")`

[Out] $\frac{1}{2} (2(x - \sqrt{x^2 + x - 1})^3 + 3(x - \sqrt{x^2 + x - 1})^2 - x + \sqrt{x^2 + x - 1} - 1) / ((x - \sqrt{x^2 + x - 1})^4 - 2(x - \sqrt{x^2 + x - 1})^2 - 4x + 4\sqrt{x^2 + x - 1}) + 1/4 \arctan(-x + \sqrt{x^2 + x - 1} - 1) + 5/8 \ln(\text{abs}(-x + \sqrt{x^2 + x - 1} + 2)) - 5/8 \ln(\text{abs}(-x + \sqrt{x^2 + x - 1}))$

$$3.13 \quad \int \frac{1}{\sqrt{a+bx+cx^2}\sqrt{d+fx^2}} dx$$

Optimal. Leaf size=1077

result too large to display

```
[Out] -(((b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f))^(1/4)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x]*Sqrt[((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)^(d + f*x^2))/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)]*(1 + (Sqrt[2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))))*Sqrt[(1 - (4*(b + Sqrt[b^2 - 4*a*c])*(c*d + a*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d + (b + Sqrt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)]/(1 + (Sqrt[2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))))^2]*EllipticF[2*ArcTan[(2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f)^(1/4)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x])/((b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x)]], (1 + ((b + Sqrt[b^2 - 4*a*c])*(c*d + a*f))/(Sqrt[2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f]*Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f)]))/2)]/((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)*(2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f)^(1/4)*Sqrt[a + b*x + c*x^2]*Sqrt[d + f*x^2]*Sqrt[1 - (4*(b + Sqrt[b^2 - 4*a*c])*(c*d + a*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d + (b + Sqrt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)))]))
```

Rubi [A] time = 6.6378, antiderivative size = 1077, normalized size of antiderivative = 1., number of rules used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.115$

$$\sqrt[4]{db^2 + \sqrt{b^2 - 4ac}db - 2a(cd - af)} \left(b + 2cx + \sqrt{b^2 - 4ac} \right)^{3/2} \sqrt{2a + \left(b + \sqrt{b^2 - 4ac} \right) x} \sqrt{\frac{\left(4ac - \left(b + \sqrt{b^2 - 4ac} \right)^2 \right)^2 (fx^2 + d)}{\left(4fa^2 + \left(b + \sqrt{b^2 - 4ac} \right)^2 d \right) \left(b + 2cx + \sqrt{b^2 - 4ac} \right)^2}}$$

$$\left(4ac - \left(b + \sqrt{b^2 - 4ac} \right)^2 \right)^2$$

Warning: Unable to verify antiderivative.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + f*x^2]),x]

[Out]
$$-\left(\left(\left(b^2 d + b \sqrt{b^2 - 4 a c}\right) d - 2 a (c d - a f)\right)^{1/4} (b + \sqrt{b^2 - 4 a c} + 2 c x)^{3/2} \sqrt{2 a + (b + \sqrt{b^2 - 4 a c}) x} \sqrt{\left(\left(4 a c - (b + \sqrt{b^2 - 4 a c})^2\right)^2 (d + f x^2)\right) / \left(\left(b + \sqrt{b^2 - 4 a c}\right)^2 d + 4 a^2 f\right)} \left(b + \sqrt{b^2 - 4 a c} + 2 c x\right)^2\right)^{1/4} \left(1 + \left(\sqrt{2 c^2 d - 2 a c f + b (b + \sqrt{b^2 - 4 a c}) f}\right) (2 a + (b + \sqrt{b^2 - 4 a c}) x)\right) / \left(\sqrt{b^2 d + b \sqrt{b^2 - 4 a c}} d - 2 a (c d - a f)\right) (b + \sqrt{b^2 - 4 a c} + 2 c x)\right) \sqrt{\left(1 - \left(4 (b + \sqrt{b^2 - 4 a c}) (c d + a f)\right) (2 a + (b + \sqrt{b^2 - 4 a c}) x)\right) / \left(\left(b + \sqrt{b^2 - 4 a c}\right)^2 d + 4 a^2 f\right)} \left(b + \sqrt{b^2 - 4 a c} + 2 c x\right) + \left(\left(4 c^2 d + (b + \sqrt{b^2 - 4 a c})^2 f\right) (2 a + (b + \sqrt{b^2 - 4 a c}) x)\right)^2 / \left(\left(b + \sqrt{b^2 - 4 a c}\right)^2 d + 4 a^2 f\right) (b + \sqrt{b^2 - 4 a c} + 2 c x)^2\right) / \left(1 + \left(\sqrt{2 c^2 d - 2 a c f + b (b + \sqrt{b^2 - 4 a c}) f}\right) (2 a + (b + \sqrt{b^2 - 4 a c}) x)\right) / \left(\sqrt{b^2 d + b \sqrt{b^2 - 4 a c}} d - 2 a (c d - a f)\right) (b + \sqrt{b^2 - 4 a c} + 2 c x)\right)^2 \text{EllipticF}\left[2 \text{ArcTan}\left[\left(2 c^2 d - 2 a c f + b (b + \sqrt{b^2 - 4 a c}) f\right)^{1/4} \sqrt{2 a + (b + \sqrt{b^2 - 4 a c}) x}\right] / \left(\left(b^2 d + b \sqrt{b^2 - 4 a c}\right) d - 2 a (c d - a f)\right)^{1/4} \sqrt{b + \sqrt{b^2 - 4 a c} + 2 c x}\right], \left(1 + \left(\left(b + \sqrt{b^2 - 4 a c}\right) (c d + a f)\right) / \left(\sqrt{2 c^2 d - 2 a c f + b (b + \sqrt{b^2 - 4 a c}) f}\right) \sqrt{b^2 d + b \sqrt{b^2 - 4 a c}} d - 2 a (c d - a f)\right) / 2\right) / \left(\left(4 a c - (b + \sqrt{b^2 - 4 a c})^2\right) (2 c^2 d - 2 a c f + b (b + \sqrt{b^2 - 4 a c}) f)^{1/4} \sqrt{a + b x + c x^2} \sqrt{d + f x^2} \sqrt{1 - \left(4 (b + \sqrt{b^2 - 4 a c}) (c d + a f)\right) (2 a + (b + \sqrt{b^2 - 4 a c}) x)\right) / \left(\left(b + \sqrt{b^2 - 4 a c}\right)^2 d + 4 a^2 f\right)} \left(b + \sqrt{b^2 - 4 a c} + 2 c x\right) + \left(\left(4 c^2 d + (b + \sqrt{b^2 - 4 a c})^2 f\right) (2 a + (b + \sqrt{b^2 - 4 a c}) x)\right)^2 / \left(\left(b + \sqrt{b^2 - 4 a c}\right)^2 d + 4 a^2 f\right) (b + \sqrt{b^2 - 4 a c} + 2 c x)^2\right)\right)$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+d)**(1/2),x)

[Out] Timed out

Mathematica [C] time = 3.42084, size = 600, normalized size = 0.56

$$2\sqrt{2} \left(\sqrt{f}x - i\sqrt{d} \right) \left(\sqrt{b^2 - 4ac} - b - 2cx \right) \sqrt{-\frac{c\sqrt{b^2-4ac}(\sqrt{f}x+i\sqrt{d})}{(\sqrt{b^2-4ac}-b-2cx)(\sqrt{f}(\sqrt{b^2-4ac}+b)-2ic\sqrt{d})}} \sqrt{\frac{c(-i\sqrt{d}(\sqrt{b^2-4ac}+2cx)+\sqrt{f}(x\sqrt{b^2-4ac}-2cx))}{(\sqrt{b^2-4ac}-b-2cx)(\sqrt{f}(\sqrt{b^2-4ac}+b)-2ic\sqrt{d})}}}$$

$$\sqrt{d+fx^2}\sqrt{a+x(b+cx)} \left(\sqrt{f} \left(\sqrt{b^2-4ac} - b \right) - 2ic\sqrt{d} \right) \sqrt{\frac{1}{\sqrt{b^2-4ac}}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + f*x^2]),x]

[Out] $(-2*\text{Sqrt}[2]*(-b + \text{Sqrt}[b^2 - 4*a*c] - 2*c*x)*((-I)*\text{Sqrt}[d] + \text{Sqrt}[f]*x)*\text{Sqrt}[-((c*\text{Sqrt}[b^2 - 4*a*c]*(I*\text{Sqrt}[d] + \text{Sqrt}[f]*x))/(((2*I)*c*\text{Sqrt}[d] + (b + \text{Sqrt}[b^2 - 4*a*c])*\text{Sqrt}[f])*(-b + \text{Sqrt}[b^2 - 4*a*c] - 2*c*x)))]*\text{Sqrt}[(c*((-I)*\text{Sqrt}[d]*(\text{Sqrt}[b^2 - 4*a*c] + 2*c*x) + \text{Sqrt}[f]*(-2*a + \text{Sqrt}[b^2 - 4*a*c]*x) + b*((-I)*\text{Sqrt}[d] - \text{Sqrt}[f]*x)))/(((2*I)*c*\text{Sqrt}[d] + (b + \text{Sqrt}[b^2 - 4*a*c])*\text{Sqrt}[f])*(-b + \text{Sqrt}[b^2 - 4*a*c] - 2*c*x))]*\text{EllipticF}[\text{ArcSin}[\text{Sqrt}[((-2*I)*c*\text{Sqrt}[d] + (-b + \text{Sqrt}[b^2 - 4*a*c])*\text{Sqrt}[f])*(b + \text{Sqrt}[b^2 - 4*a*c] + 2*c*x))/(((2*I)*c*\text{Sqrt}[d] + (b + \text{Sqrt}[b^2 - 4*a*c])*\text{Sqrt}[f])*(-b + \text{Sqrt}[b^2 - 4*a*c] - 2*c*x))], (c*d - I*\text{Sqrt}[b^2 - 4*a*c]*\text{Sqrt}[d]*\text{Sqrt}[f] + a*f)/(c*d + I*\text{Sqrt}[b^2 - 4*a*c]*\text{Sqrt}[d]*\text{Sqrt}[f] + a*f)]/(((2*I)*c*\text{Sqrt}[d] + (-b + \text{Sqrt}[b^2 - 4*a*c])*\text{Sqrt}[f])*\text{Sqrt}[(I*c*\text{Sqrt}[b^2 - 4*a*c]*(\text{Sqrt}[d] + I*\text{Sqrt}[f]*x))/(((2*I)*c*\text{Sqrt}[d] + (b + \text{Sqrt}[b^2 - 4*a*c])*\text{Sqrt}[f])*(-b + \text{Sqrt}[b^2 - 4*a*c] - 2*c*x))]*\text{Sqrt}[d + f*x^2]*\text{Sqrt}[a + x*(b + c*x)])]$

Maple [A] time = 0.268, size = 666, normalized size = 0.6

$$\frac{\left(b f^2 x^2 + 2 x^2 c f \sqrt{-d f} + \sqrt{-4 a c + b^2} f^2 x^2 + 2 x b f \sqrt{-d f} - 4 c x f d + 2 x f \sqrt{-4 a c + b^2} \sqrt{-d f} - b d f - 2 c d \sqrt{-d f} - \sqrt{-4 a c + b^2} \right) \sqrt{-d f} \left(-2 \sqrt{-d f} c + f \sqrt{-4 a c + b^2} + b f \right) \sqrt{c f x^4 + b f x^3 + a f x^2 + c d x^2 + b d x + a d}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] $4*(b*f^2*x^2+2*x^2*c*f*(-d*f)^(1/2)+(-4*a*c+b^2)^(1/2)*f^2*x^2+2*x*b*f*(-d*f)^(1/2)-4*c*x*f*d+2*x*f*(-4*a*c+b^2)^(1/2)*(-d*f)^(1/2)-b*d*f-2*c*d*(-d*f)^(1/2)-(-4*a*c+b^2)^(1/2)*d*f)*\text{EllipticF}(((2*(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/2)-b*f)*(-f*x+(-d*f)^(1/2)))/(2*(-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2)+b*f)/(f*x+(-d*f)^(1/2)))^(1/2), ((2*(-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2)-b*f)*(2*(-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2)+b*f)/(2*(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/2)+b*f))$

$$\frac{f}{(2(-df)^{1/2}c - f(-4ac + b^2)^{1/2} - bf)^{1/2}} \left((-df)^{1/2} (b + 2cx + (-4ac + b^2)^{1/2}) f / (2(-df)^{1/2}c + f(-4ac + b^2)^{1/2} + bf) / (fx + (-df)^{1/2}) \right)^{1/2} \left(-(-df)^{1/2} (-2cx + (-4ac + b^2)^{1/2} - b) f / (2(-df)^{1/2}c - f(-4ac + b^2)^{1/2} + bf) / (fx + (-df)^{1/2}) \right)^{1/2} \left((2(-df)^{1/2}c - f(-4ac + b^2)^{1/2} - bf) (-fx + (-df)^{1/2}) / (2(-df)^{1/2}c + f(-4ac + b^2)^{1/2} + bf) / (fx + (-df)^{1/2}) \right)^{1/2} (cx^2 + bx + a)^{1/2} (fx^2 + d)^{1/2} / (1/cf(-fx + (-df)^{1/2}) (fx + (-df)^{1/2}) (-2cx + (-4ac + b^2)^{1/2} - b) (b + 2cx + (-4ac + b^2)^{1/2}))^{1/2} / (-df)^{1/2} / (-2(-df)^{1/2}c + f(-4ac + b^2)^{1/2} + bf) / (cf^2x^4 + bf^2x^3 + af^2x^2 + cd^2x + b^2d^2x + ad^2)^{1/2}$$

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)),x, algorithm="maxima")

[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)), x)

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

$$\text{integral}\left(\frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integral(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)), x)

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

$$\int \frac{1}{\sqrt{d + fx^2}\sqrt{a + bx + cx^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+d)**(1/2),x)`

[Out] `Integral(1/(sqrt(d + f*x**2)*sqrt(a + b*x + c*x**2)), x)`

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)),x, algorithm="giac")`

[Out] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)), x)`

$$3.14 \quad \int \frac{\sqrt{-3-4x-x^2}}{3+4x+2x^2} dx$$

Optimal. Leaf size=98

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

[Out] -ArcSin[2 + x]/2 - ArcTan[(1 - (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt[2]]/Sqrt[2] + ArcTan[(1 + (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt[2]]/Sqrt[2] - ArcTanh[x/Sqrt[-3 - 4*x - x^2]]/2

Rubi [A] time = 0.488633, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.444$

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

Antiderivative was successfully verified.

[In] Int[Sqrt[-3 - 4*x - x^2]/(3 + 4*x + 2*x^2), x]

[Out] -ArcSin[2 + x]/2 - ArcTan[(1 - (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt[2]]/Sqrt[2] + ArcTan[(1 + (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt[2]]/Sqrt[2] - ArcTanh[x/Sqrt[-3 - 4*x - x^2]]/2

Rubi in Sympy [A] time = 72.3176, size = 116, normalized size = 1.18

$$\frac{\sqrt{2} \operatorname{atan}\left(\sqrt{2}\left(\frac{3\left(\frac{x}{3}+1\right)}{2\sqrt{-x^2-4x-3}}-\frac{1}{2}\right)\right)}{2} + \frac{\sqrt{2} \operatorname{atan}\left(\sqrt{2}\left(\frac{3\left(\frac{x}{3}+1\right)}{2\sqrt{-x^2-4x-3}}+\frac{1}{2}\right)\right)}{2} - \frac{\operatorname{atan}\left(-\frac{-2x-4}{2\sqrt{-x^2-4x-3}}\right)}{2} - \frac{\operatorname{atanh}\left(\frac{x}{\sqrt{-x^2-4x-3}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((-x**2-4*x-3)**(1/2)/(2*x**2+4*x+3), x)

[Out] sqrt(2)*atan(sqrt(2)*(3*(x/3 + 1)/(2*sqrt(-x**2 - 4*x - 3)) - 1/2))/2 + sqrt(2)*atan(sqrt(2)*(3*(x/3 + 1)/(2*sqrt(-x**2 - 4*x - 3)) + 1/2))/2 - atan(-2*x-4/(2*sqrt(-x**2 - 4*x - 3)))/2 - atanh(x/sqrt(-x**2 - 4*x - 3))/2

$$\left. \right) + 1/2))/2 - \operatorname{atan}(-(-2*x - 4)/(2*\sqrt{-x**2 - 4*x - 3}))/2 - \operatorname{atanh}(x/\sqrt{-x**2 - 4*x - 3}))/2$$

Mathematica [C] time = 6.27466, size = 1087, normalized size = 11.09

$$\begin{aligned} & -\frac{1}{2} \sin^{-1}(x+2) \\ & + \frac{i \left(i + 2\sqrt{2} \right) \tan^{-1} \left(\frac{6i\sqrt{2}x^4 - 16x^4 + 18i\sqrt{1-2i\sqrt{2}}\sqrt{-x^2-4x-3}x^3 + 68i\sqrt{2}x^3 - 68x^3 + 72i\sqrt{1-2i\sqrt{2}}\sqrt{-x^2-4x-3}x^2 + 185i\sqrt{2}x^2 - 44x^2 + 99i\sqrt{1-2i\sqrt{2}}\sqrt{-x^2-4x-3}}{32\sqrt{2}x^4 + 66ix^4 + 208\sqrt{2}x^3 + 304ix^3 + 466\sqrt{2}x^2 + 493ix^2 + 440\sqrt{2}x + 340ix + 150\sqrt{2} + 93i} \right)}{4\sqrt{1-2i\sqrt{2}}} \\ & + \frac{i \left(-i + 2\sqrt{2} \right) \tan^{-1} \left(\frac{6i\sqrt{2}x^4 + 16x^4 + 18i\sqrt{1+2i\sqrt{2}}\sqrt{-x^2-4x-3}x^3 + 68i\sqrt{2}x^3 + 68x^3 + 72i\sqrt{1+2i\sqrt{2}}\sqrt{-x^2-4x-3}x^2 + 185i\sqrt{2}x^2 + 44x^2 + 99i\sqrt{1+2i\sqrt{2}}\sqrt{-x^2-4x-3}}{32\sqrt{2}x^4 - 66ix^4 + 208\sqrt{2}x^3 - 304ix^3 + 466\sqrt{2}x^2 - 493ix^2 + 440\sqrt{2}x - 340ix + 150\sqrt{2} - 93i} \right)}{4\sqrt{1+2i\sqrt{2}}} \\ & - \frac{\left(i + 2\sqrt{2} \right) \log \left(\left(-2ix + \sqrt{2} - 2i \right)^2 \left(2ix + \sqrt{2} + 2i \right)^2 \right)}{8\sqrt{1-2i\sqrt{2}}} \\ & - \frac{\left(-i + 2\sqrt{2} \right) \log \left(\left(-2ix + \sqrt{2} - 2i \right)^2 \left(2ix + \sqrt{2} + 2i \right)^2 \right)}{8\sqrt{1+2i\sqrt{2}}} \\ & + \frac{\left(i + 2\sqrt{2} \right) \log \left(\left(2x^2 + 4x + 3 \right) \left(2i\sqrt{2}x^2 + 2x^2 - 2\sqrt{2} \left(1 - 2i\sqrt{2} \right) \sqrt{-x^2 - 4x - 3}x + 8i\sqrt{2}x + 4x - 2\sqrt{2} \left(1 - 2i\sqrt{2} \right) \sqrt{-x^2 - 4x - 3} \right)}{8\sqrt{1-2i\sqrt{2}}} \\ & + \frac{\left(-i + 2\sqrt{2} \right) \log \left(\left(2x^2 + 4x + 3 \right) \left(-2i\sqrt{2}x^2 + 2x^2 - 2\sqrt{2} \left(1 + 2i\sqrt{2} \right) \sqrt{-x^2 - 4x - 3}x - 8i\sqrt{2}x + 4x - 2\sqrt{2} \left(1 + 2i\sqrt{2} \right) \sqrt{-x^2 - 4x - 3} \right)}{8\sqrt{1+2i\sqrt{2}}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[-3 - 4*x - x^2]/(3 + 4*x + 2*x^2),x]

[Out] $-\operatorname{ArcSin}[2 + x]/2 + ((I/4)*(I + 2*\operatorname{Sqrt}[2])* \operatorname{ArcTan}[(60 + (51*I)*\operatorname{Sqrt}[2] + 68*x + (176*I)*\operatorname{Sqrt}[2]*x - 44*x^2 + (185*I)*\operatorname{Sqrt}[2]*x^2 - 68*x^3 + (68*I)*\operatorname{Sqrt}[2]*x^3 - 16*x^4 + (6*I)*\operatorname{Sqrt}[2]*x^4 + (54*I)*\operatorname{Sqrt}[1 - (2*I)*\operatorname{Sqrt}[2]]*\operatorname{Sqrt}[-3 - 4*x - x^2] + (99*I)*\operatorname{Sqrt}[1 - (2*I)*\operatorname{Sqrt}[2]]*x*\operatorname{Sqrt}[-3 - 4*x - x^2] + (72*I)*\operatorname{Sqrt}[1 - (2*I)*\operatorname{Sqrt}[2]]*x^2*\operatorname{Sqrt}[-3 - 4*x - x^2] + (18*I)*\operatorname{Sqrt}[1 - (2*I)*\operatorname{Sqrt}[2]]*x^3*\operatorname{Sqrt}[-3 - 4*x - x^2])/(93*I + 150*\operatorname{Sqrt}[2] + (340*I)*x + 440*\operatorname{Sqrt}[2]*x + (493*I)*x^2 + 466*\operatorname{Sqrt}[2]*x^2 + (304*I)*x^3 + 208*\operatorname{Sqrt}[2]*x^3 + (66*I)*x^4 + 32*\operatorname{Sqrt}[2]*x^4)]/\operatorname{Sqrt}[1 - (2*I)*\operatorname{Sqrt}[2]] + ((I/4)*(-I + 2*\operatorname{Sqrt}[2])* \operatorname{ArcTan}[(-60 + (51*I)*\operatorname{Sqrt}[2] - 68*x + (176*I)*\operatorname{Sqrt}[2]*x + 44*x^2 + (185*I)*\operatorname{Sqrt}[2]*x^2 + 68*x^3 + (68*I)*\operatorname{Sqrt}[2]*x^3 + 16*x^4 + (6*I)*\operatorname{Sqrt}[2]*x^4 + (54*I)*\operatorname{Sqrt}[1 + (2*I)*\operatorname{Sqrt}[2]]*\operatorname{Sqrt}[-3 - 4*x - x^2] + (99*I)*\operatorname{Sqrt}[1 + (2*I)*\operatorname{Sqrt}[2]]*x*\operatorname{Sqrt}[-3 - 4*x - x^2] + (72*I)*\operatorname{Sqrt}[1 + (2*I)*\operatorname{Sqrt}[2]]*x^2*\operatorname{Sqrt}[-3$

$$\begin{aligned} & - 4*x - x^2] + (18*I)*\text{Sqrt}[1 + (2*I)*\text{Sqrt}[2]]*x^3*\text{Sqrt}[-3 - 4*x - \\ & x^2])/(-93*I + 150*\text{Sqrt}[2] - (340*I)*x + 440*\text{Sqrt}[2]*x - (493*I) \\ & *x^2 + 466*\text{Sqrt}[2]*x^2 - (304*I)*x^3 + 208*\text{Sqrt}[2]*x^3 - (66*I)*x \\ & ^4 + 32*\text{Sqrt}[2]*x^4))/\text{Sqrt}[1 + (2*I)*\text{Sqrt}[2]] - ((-I + 2*\text{Sqrt}[2] \\ &)*\text{Log}[-(2*I + \text{Sqrt}[2] - (2*I)*x)^2*(2*I + \text{Sqrt}[2] + (2*I)*x)^2])/ \\ & (8*\text{Sqrt}[1 + (2*I)*\text{Sqrt}[2]]) - ((I + 2*\text{Sqrt}[2])*\text{Log}[-(2*I + \text{Sqrt}[2] \\ &] - (2*I)*x)^2*(2*I + \text{Sqrt}[2] + (2*I)*x)^2))/(8*\text{Sqrt}[1 - (2*I)*\text{Sq} \\ & \text{rt}[2]]) + ((I + 2*\text{Sqrt}[2])*\text{Log}[(3 + 4*x + 2*x^2)*(3 + (6*I)*\text{Sqrt}[\\ & 2] + 4*x + (8*I)*\text{Sqrt}[2]*x + 2*x^2 + (2*I)*\text{Sqrt}[2]*x^2 - 2*\text{Sqrt}[2 \\ & *(1 - (2*I)*\text{Sqrt}[2])]*\text{Sqrt}[-3 - 4*x - x^2] - 2*\text{Sqrt}[2*(1 - (2*I)* \\ & \text{Sqrt}[2])]*x*\text{Sqrt}[-3 - 4*x - x^2)))]/(8*\text{Sqrt}[1 - (2*I)*\text{Sqrt}[2]]) + \\ & ((-I + 2*\text{Sqrt}[2])*\text{Log}[(3 + 4*x + 2*x^2)*(3 - (6*I)*\text{Sqrt}[2] + 4*x \\ & - (8*I)*\text{Sqrt}[2]*x + 2*x^2 - (2*I)*\text{Sqrt}[2]*x^2 - 2*\text{Sqrt}[2*(1 + (2 \\ & *I)*\text{Sqrt}[2])]*\text{Sqrt}[-3 - 4*x - x^2] - 2*\text{Sqrt}[2*(1 + (2*I)*\text{Sqrt}[2]) \\ &]*x*\text{Sqrt}[-3 - 4*x - x^2)))]/(8*\text{Sqrt}[1 + (2*I)*\text{Sqrt}[2]]) \end{aligned}$$

Maple [B] time = 0.04, size = 341, normalized size = 3.5

$$\begin{aligned} & \frac{\arcsin(2+x)}{2} \\ & + \frac{\sqrt{3}\sqrt{4}}{12} \sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12} \left(\sqrt{2} \arctan \left(\frac{\sqrt{2}}{6} \sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12} \right) - \text{Artanh} \left(3 \frac{x}{-3/2-x} \frac{1}{\sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12}} \right) \right) \frac{1}{\sqrt{1(x^2 -} \\ & - \frac{\sqrt{3}\sqrt{4}\sqrt{2}}{3} \sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12} \arctan \left(\frac{\sqrt{2}}{6} \sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12} \right) \frac{1}{\sqrt{1(x^2(-\frac{3}{2}-x)^{-2} - 4)(1+x(-\frac{3}{2}-x)^{-1})^{-2}}} \left(1+x \right. \\ & \left. + \frac{\sqrt{3}\sqrt{4}}{6} \sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12} \left(\sqrt{2} \arctan \left(\frac{\sqrt{2}}{6} \sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12} \right) + \text{Artanh} \left(3 \frac{x}{-3/2-x} \frac{1}{\sqrt{3 \frac{x^2}{(-3/2-x)^2} - 12}} \right) \right) \frac{1}{\sqrt{1(x^2(-} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((-x^2-4*x-3)^(1/2)/(2*x^2+4*x+3),x)

[Out] -1/2*arcsin(2+x)+1/12*3^(1/2)*4^(1/2)*(3*x^2/(-3/2-x)^2-12)^(1/2)*
 *(2^(1/2)*arctan(1/6*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(1/2))-arctanh
 (3*x/(-3/2-x)/(3*x^2/(-3/2-x)^2-12)^(1/2)))/((x^2/(-3/2-x)^2-4)/(1+x/(-3/2-x))^2)^(1/2)/(1+x/(-3/2-x))-1/3*3^(1/2)*4^(1/2)/((x^2/(-3/2-x)^2-4)/(1+x/(-3/2-x))^2)^(1/2)/(1+x/(-3/2-x))*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(1/2)*arctan(1/6*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(1/2))+1/6*3^(1/2)*4^(1/2)*(3*x^2/(-3/2-x)^2-12)^(1/2)*(2^(1/2)*arctan(1/6*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(1/2))+arctanh(3*x/(-3/2-x)/(3*x^2/(-3/2-x)^2-12)^(1/2)))/((x^2/(-3/2-x)^2-4)/(1+x/(-3/2-x))^2)^(1/2)/(1+x/(-3/2-x))

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

$$\int \frac{\sqrt{-x^2 - 4x - 3}}{2x^2 + 4x + 3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3), x, algorithm="maxima")

[Out] integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3), x)

Fricas [A] time = 0.28974, size = 213, normalized size = 2.17

$$-\frac{1}{16} \sqrt{2} \left(4 \sqrt{2} \arctan \left(\frac{x+2}{\sqrt{-x^2-4x-3}} \right) - \sqrt{2} \log \left(-\frac{2\sqrt{-x^2-4x-3}x+4x+3}{x^2} \right) + \sqrt{2} \log \left(\frac{2\sqrt{-x^2-4x-3}x-4x-3}{x^2} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3), x, algorithm="fricas")

[Out] -1/16*sqrt(2)*(4*sqrt(2)*arctan((x+2)/sqrt(-x^2-4*x-3)) - sqrt(2)*log(-(2*sqrt(-x^2-4*x-3)*x+4*x+3)/x^2) + sqrt(2)*log((2*sqrt(-x^2-4*x-3)*x-4*x-3)/x^2) + 4*arctan(1/2*(sqrt(2)*x+3*sqrt(2)*sqrt(-x^2-4*x-3))/(2*x+3)) + 4*arctan(-1/2*(sqrt(2)*x-3*sqrt(2)*sqrt(-x^2-4*x-3))/(2*x+3)))

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

$$\int \frac{\sqrt{-(x+1)(x+3)}}{2x^2 + 4x + 3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((-x**2-4*x-3)**(1/2)/(2*x**2+4*x+3), x)

[Out] Integral(sqrt(-(x+1)*(x+3))/(2*x**2+4*x+3), x)

GIAC/XCAS [A] time = 0.272664, size = 231, normalized size = 2.36

$$\begin{aligned}
 & -\frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\frac{3\left(\sqrt{-x^2-4x-3}-1\right)}{x+2}+1\right)\right) \\
 & -\frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\frac{\sqrt{-x^2-4x-3}-1}{x+2}+1\right)\right)-\frac{1}{2}\arcsin(x+2) \\
 & -\frac{1}{4}\ln\left(\frac{2\left(\sqrt{-x^2-4x-3}-1\right)}{x+2}+\frac{3\left(\sqrt{-x^2-4x-3}-1\right)^2}{(x+2)^2}+1\right) \\
 & +\frac{1}{4}\ln\left(\frac{2\left(\sqrt{-x^2-4x-3}-1\right)}{x+2}+\frac{\left(\sqrt{-x^2-4x-3}-1\right)^2}{(x+2)^2}+3\right)
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3),x, algorithm="giac")

[Out] -1/2*sqrt(2)*arctan(1/2*sqrt(2)*(3*(sqrt(-x^2 - 4*x - 3) - 1)/(x + 2) + 1)) - 1/2*sqrt(2)*arctan(1/2*sqrt(2)*((sqrt(-x^2 - 4*x - 3) - 1)/(x + 2) + 1)) - 1/2*arcsin(x + 2) - 1/4*ln(2*(sqrt(-x^2 - 4*x - 3) - 1)/(x + 2) + 3*(sqrt(-x^2 - 4*x - 3) - 1)^2/(x + 2)^2 + 1) + 1/4*ln(2*(sqrt(-x^2 - 4*x - 3) - 1)/(x + 2) + (sqrt(-x^2 - 4*x - 3) - 1)^2/(x + 2)^2 + 3))

$$3.15 \quad \int (3 - x + 2x^2) (2 + 3x + 5x^2)^4 dx$$

Optimal. Leaf size=68

$$\frac{1250x^{11}}{11} + \frac{475x^{10}}{2} + \frac{5075x^9}{9} + \frac{3415x^8}{4} + 1176x^7 + \frac{2377x^6}{2} + \frac{5099x^5}{5} + 656x^4 + \frac{1064x^3}{3} + 136x^2 + 48x$$

[Out] 48*x + 136*x^2 + (1064*x^3)/3 + 656*x^4 + (5099*x^5)/5 + (2377*x^6)/2 + 1176*x^7 + (3415*x^8)/4 + (5075*x^9)/9 + (475*x^10)/2 + (1250*x^11)/11

Rubi [A] time = 0.0795423, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{1250x^{11}}{11} + \frac{475x^{10}}{2} + \frac{5075x^9}{9} + \frac{3415x^8}{4} + 1176x^7 + \frac{2377x^6}{2} + \frac{5099x^5}{5} + 656x^4 + \frac{1064x^3}{3} + 136x^2 + 48x$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^4, x]

[Out] 48*x + 136*x^2 + (1064*x^3)/3 + 656*x^4 + (5099*x^5)/5 + (2377*x^6)/2 + 1176*x^7 + (3415*x^8)/4 + (5075*x^9)/9 + (475*x^10)/2 + (1250*x^11)/11

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{1250x^{11}}{11} + \frac{475x^{10}}{2} + \frac{5075x^9}{9} + \frac{3415x^8}{4} + 1176x^7 + \frac{2377x^6}{2} + \frac{5099x^5}{5} + 656x^4 + \frac{1064x^3}{3} + 48x + 272 \int x dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2)**4, x)

[Out] 1250*x**11/11 + 475*x**10/2 + 5075*x**9/9 + 3415*x**8/4 + 1176*x**7 + 2377*x**6/2 + 5099*x**5/5 + 656*x**4 + 1064*x**3/3 + 48*x + 272*Integral(x, x)

Mathematica [A] time = 0.0049031, size = 68, normalized size = 1.

$$\frac{1250x^{11}}{11} + \frac{475x^{10}}{2} + \frac{5075x^9}{9} + \frac{3415x^8}{4} + 1176x^7 + \frac{2377x^6}{2} + \frac{5099x^5}{5} + 656x^4 + \frac{1064x^3}{3} + 136x^2 + 48x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^4,x]

[Out] $48x + 136x^2 + \frac{1064x^3}{3} + 656x^4 + \frac{5099x^5}{5} + \frac{2377x^6}{2} + 1176x^7 + \frac{3415x^8}{4} + \frac{5075x^9}{9} + \frac{475x^{10}}{2} + \frac{1250x^{11}}{11}$

Maple [A] time = 0.002, size = 55, normalized size = 0.8

$$48x + 136x^2 + \frac{1064x^3}{3} + 656x^4 + \frac{5099x^5}{5} + \frac{2377x^6}{2} + 1176x^7 + \frac{3415x^8}{4} + \frac{5075x^9}{9} + \frac{475x^{10}}{2} + \frac{1250x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)*(5*x^2+3*x+2)^4,x)

[Out] $48x + 136x^2 + 1064/3x^3 + 656x^4 + 5099/5x^5 + 2377/2x^6 + 1176x^7 + 3415/4x^8 + 5075/9x^9 + 475/2x^{10} + 1250/11x^{11}$

Maxima [A] time = 0.698285, size = 73, normalized size = 1.07

$$\frac{1250}{11}x^{11} + \frac{475}{2}x^{10} + \frac{5075}{9}x^9 + \frac{3415}{4}x^8 + 1176x^7 + \frac{2377}{2}x^6 + \frac{5099}{5}x^5 + 656x^4 + \frac{1064}{3}x^3 + 136x^2 + 48x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3),x, algorithm="maxima")

[Out] $1250/11x^{11} + 475/2x^{10} + 5075/9x^9 + 3415/4x^8 + 1176x^7 + 2377/2x^6 + 5099/5x^5 + 656x^4 + 1064/3x^3 + 136x^2 + 48x$

Fricas [A] time = 0.231218, size = 1, normalized size = 0.01

$$\frac{1250}{11}x^{11} + \frac{475}{2}x^{10} + \frac{5075}{9}x^9 + \frac{3415}{4}x^8 + 1176x^7 + \frac{2377}{2}x^6 + \frac{5099}{5}x^5 + 656x^4 + \frac{1064}{3}x^3 + 136x^2 + 48x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3),x, algorithm="fricas")

[Out] $1250/11*x^{11} + 475/2*x^{10} + 5075/9*x^9 + 3415/4*x^8 + 1176*x^7 + 2377/2*x^6 + 5099/5*x^5 + 656*x^4 + 1064/3*x^3 + 136*x^2 + 48*x$

Sympy [A] time = 0.068012, size = 65, normalized size = 0.96

$$\frac{1250x^{11}}{11} + \frac{475x^{10}}{2} + \frac{5075x^9}{9} + \frac{3415x^8}{4} + 1176x^7 + \frac{2377x^6}{2} + \frac{5099x^5}{5} + 656x^4 + \frac{1064x^3}{3} + 136x^2 + 48x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)*(5*x**2+3*x+2)**4,x)`

[Out] $1250*x^{11}/11 + 475*x^{10}/2 + 5075*x^9/9 + 3415*x^8/4 + 1176*x^7 + 2377*x^6/2 + 5099*x^5/5 + 656*x^4 + 1064*x^3/3 + 136*x^2 + 48*x$

GIAC/XCAS [A] time = 0.262765, size = 73, normalized size = 1.07

$$\frac{1250}{11}x^{11} + \frac{475}{2}x^{10} + \frac{5075}{9}x^9 + \frac{3415}{4}x^8 + 1176x^7 + \frac{2377}{2}x^6 + \frac{5099}{5}x^5 + 656x^4 + \frac{1064}{3}x^3 + 136x^2 + 48x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3),x, algorithm="giac")`

[Out] $1250/11*x^{11} + 475/2*x^{10} + 5075/9*x^9 + 3415/4*x^8 + 1176*x^7 + 2377/2*x^6 + 5099/5*x^5 + 656*x^4 + 1064/3*x^3 + 136*x^2 + 48*x$

$$3.16 \quad \int (3 - x + 2x^2) (2 + 3x + 5x^2)^3 dx$$

Optimal. Leaf size=56

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

[Out] $24*x + 50*x^2 + (322*x^3)/3 + (579*x^4)/4 + (876*x^5)/5 + 134*x^6 + (720*x^7)/7 + (325*x^8)/8 + (250*x^9)/9$

Rubi [A] time = 0.0654634, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3, x]$

[Out] $24*x + 50*x^2 + (322*x^3)/3 + (579*x^4)/4 + (876*x^5)/5 + 134*x^6 + (720*x^7)/7 + (325*x^8)/8 + (250*x^9)/9$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 24x + 100 \int x dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{rubi_integrate}((2*x**2-x+3)*(5*x**2+3*x+2)**3, x)$

[Out] $250*x**9/9 + 325*x**8/8 + 720*x**7/7 + 134*x**6 + 876*x**5/5 + 579*x**4/4 + 322*x**3/3 + 24*x + 100*Integral(x, x)$

Mathematica [A] time = 0.00278641, size = 56, normalized size = 1.

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3, x]

[Out] 24*x + 50*x^2 + (322*x^3)/3 + (579*x^4)/4 + (876*x^5)/5 + 134*x^6 + (720*x^7)/7 + (325*x^8)/8 + (250*x^9)/9

Maple [A] time = 0.002, size = 45, normalized size = 0.8

$$24x + 50x^2 + \frac{322x^3}{3} + \frac{579x^4}{4} + \frac{876x^5}{5} + 134x^6 + \frac{720x^7}{7} + \frac{325x^8}{8} + \frac{250x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)*(5*x^2+3*x+2)^3, x)

[Out] 24*x+50*x^2+322/3*x^3+579/4*x^4+876/5*x^5+134*x^6+720/7*x^7+325/8*x^8+250/9*x^9

Maxima [A] time = 0.690697, size = 59, normalized size = 1.05

$$\frac{250}{9}x^9 + \frac{325}{8}x^8 + \frac{720}{7}x^7 + 134x^6 + \frac{876}{5}x^5 + \frac{579}{4}x^4 + \frac{322}{3}x^3 + 50x^2 + 24x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 250/9*x^9 + 325/8*x^8 + 720/7*x^7 + 134*x^6 + 876/5*x^5 + 579/4*x^4 + 322/3*x^3 + 50*x^2 + 24*x

Fricas [A] time = 0.230585, size = 1, normalized size = 0.02

$$\frac{250}{9}x^9 + \frac{325}{8}x^8 + \frac{720}{7}x^7 + 134x^6 + \frac{876}{5}x^5 + \frac{579}{4}x^4 + \frac{322}{3}x^3 + 50x^2 + 24x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3), x, algorithm="fricas")

[Out] $250/9*x^9 + 325/8*x^8 + 720/7*x^7 + 134*x^6 + 876/5*x^5 + 579/4*x^4 + 322/3*x^3 + 50*x^2 + 24*x$

Sympy [A] time = 0.062597, size = 53, normalized size = 0.95

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)*(5*x**2+3*x+2)**3,x)`

[Out] $250*x**9/9 + 325*x**8/8 + 720*x**7/7 + 134*x**6 + 876*x**5/5 + 579*x**4/4 + 322*x**3/3 + 50*x**2 + 24*x$

GIAC/XCAS [A] time = 0.263466, size = 59, normalized size = 1.05

$$\frac{250}{9}x^9 + \frac{325}{8}x^8 + \frac{720}{7}x^7 + 134x^6 + \frac{876}{5}x^5 + \frac{579}{4}x^4 + \frac{322}{3}x^3 + 50x^2 + 24x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3),x, algorithm="giac")`

[Out] $250/9*x^9 + 325/8*x^8 + 720/7*x^7 + 134*x^6 + 876/5*x^5 + 579/4*x^4 + 322/3*x^3 + 50*x^2 + 24*x$

$$3.17 \quad \int (3 - x + 2x^2) (2 + 3x + 5x^2)^2 dx$$

Optimal. Leaf size=44

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

[Out] 12*x + 16*x^2 + (83*x^3)/3 + (85*x^4)/4 + (103*x^5)/5 + (35*x^6)/6 + (50*x^7)/7

Rubi [A] time = 0.0480806, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2, x]

[Out] 12*x + 16*x^2 + (83*x^3)/3 + (85*x^4)/4 + (103*x^5)/5 + (35*x^6)/6 + (50*x^7)/7

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 12x + 32 \int x dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2)**2, x)

[Out] 50*x**7/7 + 35*x**6/6 + 103*x**5/5 + 85*x**4/4 + 83*x**3/3 + 12*x + 32*Integral(x, x)

Mathematica [A] time = 0.00202069, size = 44, normalized size = 1.

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2, x]

[Out] 12*x + 16*x^2 + (83*x^3)/3 + (85*x^4)/4 + (103*x^5)/5 + (35*x^6)/6 + (50*x^7)/7

Maple [A] time = 0.001, size = 35, normalized size = 0.8

$$12x + 16x^2 + \frac{83x^3}{3} + \frac{85x^4}{4} + \frac{103x^5}{5} + \frac{35x^6}{6} + \frac{50x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)*(5*x^2+3*x+2)^2, x)

[Out] 12*x+16*x^2+83/3*x^3+85/4*x^4+103/5*x^5+35/6*x^6+50/7*x^7

Maxima [A] time = 0.689429, size = 46, normalized size = 1.05

$$\frac{50}{7}x^7 + \frac{35}{6}x^6 + \frac{103}{5}x^5 + \frac{85}{4}x^4 + \frac{83}{3}x^3 + 16x^2 + 12x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 50/7*x^7 + 35/6*x^6 + 103/5*x^5 + 85/4*x^4 + 83/3*x^3 + 16*x^2 + 12*x

Fricas [A] time = 0.230769, size = 1, normalized size = 0.02

$$\frac{50}{7}x^7 + \frac{35}{6}x^6 + \frac{103}{5}x^5 + \frac{85}{4}x^4 + \frac{83}{3}x^3 + 16x^2 + 12x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3), x, algorithm="fricas")

[Out] $50/7*x^7 + 35/6*x^6 + 103/5*x^5 + 85/4*x^4 + 83/3*x^3 + 16*x^2 + 12*x$

Sympy [A] time = 0.055798, size = 41, normalized size = 0.93

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)*(5*x**2+3*x+2)**2,x)`

[Out] $50*x^{**7}/7 + 35*x^{**6}/6 + 103*x^{**5}/5 + 85*x^{**4}/4 + 83*x^{**3}/3 + 16*x^{**2} + 12*x$

GIAC/XCAS [A] time = 0.262348, size = 46, normalized size = 1.05

$$\frac{50}{7}x^7 + \frac{35}{6}x^6 + \frac{103}{5}x^5 + \frac{85}{4}x^4 + \frac{83}{3}x^3 + 16x^2 + 12x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3),x, algorithm="giac")`

[Out] $50/7*x^7 + 35/6*x^6 + 103/5*x^5 + 85/4*x^4 + 83/3*x^3 + 16*x^2 + 12*x$

$$3.18 \quad \int (3 - x + 2x^2) (2 + 3x + 5x^2) dx$$

Optimal. Leaf size=30

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

[Out] $6*x + (7*x^2)/2 + (16*x^3)/3 + x^4/4 + 2*x^5$

Rubi [A] time = 0.0305126, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2), x]

[Out] $6*x + (7*x^2)/2 + (16*x^3)/3 + x^4/4 + 2*x^5$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + 6x + 7 \int x dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2), x)

[Out] $2*x**5 + x**4/4 + 16*x**3/3 + 6*x + 7*Integral(x, x)$

Mathematica [A] time = 0.00166519, size = 30, normalized size = 1.

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2), x]

[Out] $6x + (7x^2)/2 + (16x^3)/3 + x^4/4 + 2x^5$

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$6x + \frac{7x^2}{2} + \frac{16x^3}{3} + \frac{x^4}{4} + 2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)*(5*x^2+3*x+2),x)`

[Out] $6x + 7/2x^2 + 16/3x^3 + 1/4x^4 + 2x^5$

Maxima [A] time = 0.688089, size = 32, normalized size = 1.07

$$2x^5 + \frac{1}{4}x^4 + \frac{16}{3}x^3 + \frac{7}{2}x^2 + 6x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3),x, algorithm="maxima")`

[Out] $2x^5 + 1/4x^4 + 16/3x^3 + 7/2x^2 + 6x$

Fricas [A] time = 0.238017, size = 1, normalized size = 0.03

$$2x^5 + \frac{1}{4}x^4 + \frac{16}{3}x^3 + \frac{7}{2}x^2 + 6x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3),x, algorithm="fricas")`

[Out] $2x^5 + 1/4x^4 + 16/3x^3 + 7/2x^2 + 6x$

Sympy [A] time = 0.040809, size = 26, normalized size = 0.87

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)*(5*x**2+3*x+2),x)`

[Out] `2*x**5 + x**4/4 + 16*x**3/3 + 7*x**2/2 + 6*x`

GIAC/XCAS [A] time = 0.262154, size = 32, normalized size = 1.07

$$2x^5 + \frac{1}{4}x^4 + \frac{16}{3}x^3 + \frac{7}{2}x^2 + 6x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3),x, algorithm="giac")`

[Out] `2*x^5 + 1/4*x^4 + 16/3*x^3 + 7/2*x^2 + 6*x`

$$3.19 \quad \int \frac{3-x+2x^2}{2+3x+5x^2} dx$$

Optimal. Leaf size=42

$$-\frac{11}{50} \log(5x^2 + 3x + 2) + \frac{2x}{5} + \frac{143 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{25\sqrt{31}}$$

[Out] (2*x)/5 + (143*ArcTan[(3 + 10*x)/Sqrt[31]])/(25*Sqrt[31]) - (11*Log[2 + 3*x + 5*x^2])/50

Rubi [A] time = 0.079735, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$

$$-\frac{11}{50} \log(5x^2 + 3x + 2) + \frac{2x}{5} + \frac{143 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{25\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2), x]

[Out] (2*x)/5 + (143*ArcTan[(3 + 10*x)/Sqrt[31]])/(25*Sqrt[31]) - (11*Log[2 + 3*x + 5*x^2])/50

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{11 \log(5x^2 + 3x + 2)}{50} + \frac{143\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{775} + \int \frac{2}{5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)/(5*x**2+3*x+2), x)

[Out] -11*log(5*x**2 + 3*x + 2)/50 + 143*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/775 + Integral(2/5, x)

Mathematica [A] time = 0.0278974, size = 42, normalized size = 1.

$$-\frac{11}{50} \log(5x^2 + 3x + 2) + \frac{2x}{5} + \frac{143 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{25\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2), x]

[Out] (2*x)/5 + (143*ArcTan[(3 + 10*x)/Sqrt[31]])/(25*Sqrt[31]) - (11*Log[2 + 3*x + 5*x^2])/50

Maple [A] time = 0.006, size = 34, normalized size = 0.8

$$\frac{2x}{5} - \frac{11 \ln(5x^2 + 3x + 2)}{50} + \frac{143\sqrt{31}}{775} \arctan\left(\frac{(3 + 10x)\sqrt{31}}{31}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)/(5*x^2+3*x+2), x)

[Out] 2/5*x-11/50*ln(5*x^2+3*x+2)+143/775*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/2)

Maxima [A] time = 0.782048, size = 45, normalized size = 1.07

$$\frac{143}{775} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{2}{5}x - \frac{11}{50} \log(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2), x, algorithm="maxima")

[Out] 143/775*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 2/5*x - 11/50*log(5*x^2 + 3*x + 2)

Fricas [A] time = 0.261923, size = 55, normalized size = 1.31

$$\frac{1}{1550} \sqrt{31} \left(20 \sqrt{31} x - 11 \sqrt{31} \log(5x^2 + 3x + 2) + 286 \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="fricas")`

[Out] `1/1550*sqrt(31)*(20*sqrt(31)*x - 11*sqrt(31)*log(5*x^2 + 3*x + 2) + 286*arctan(1/31*sqrt(31)*(10*x + 3)))`

Sympy [A] time = 0.134828, size = 49, normalized size = 1.17

$$\frac{2x}{5} - \frac{11 \log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{50} + \frac{143\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{775}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)/(5*x**2+3*x+2),x)`

[Out] `2*x/5 - 11*log(x**2 + 3*x/5 + 2/5)/50 + 143*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/775`

GIAC/XCAS [A] time = 0.265926, size = 45, normalized size = 1.07

$$\frac{143}{775} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{2}{5}x - \frac{11}{50} \ln(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="giac")`

[Out] `143/775*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 2/5*x - 11/50*ln(5*x^2 + 3*x + 2)`

$$3.20 \quad \int \frac{3-x+2x^2}{(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=43

$$\frac{11(13x+7)}{155(5x^2+3x+2)} + \frac{82 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{31\sqrt{31}}$$

[Out] (11*(7 + 13*x))/(155*(2 + 3*x + 5*x^2)) + (82*ArcTan[(3 + 10*x)/Sqrt[31]])/(31*Sqrt[31])

Rubi [A] time = 0.0507247, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$

$$\frac{11(13x+7)}{155(5x^2+3x+2)} + \frac{82 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{31\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^2, x]

[Out] (11*(7 + 13*x))/(155*(2 + 3*x + 5*x^2)) + (82*ArcTan[(3 + 10*x)/Sqrt[31]])/(31*Sqrt[31])

Rubi in Sympy [A] time = 9.29388, size = 37, normalized size = 0.86

$$\frac{143x+77}{155(5x^2+3x+2)} + \frac{82\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{961}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)/(5*x**2+3*x+2)**2, x)

[Out] (143*x + 77)/(155*(5*x**2 + 3*x + 2)) + 82*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/961

Mathematica [A] time = 0.030926, size = 43, normalized size = 1.

$$\frac{11(13x + 7)}{155(5x^2 + 3x + 2)} + \frac{82 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{31\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^2, x]

[Out] (11*(7 + 13*x))/(155*(2 + 3*x + 5*x^2)) + (82*ArcTan[(3 + 10*x)/Sqrt[31]])/(31*Sqrt[31])

Maple [A] time = 0.009, size = 34, normalized size = 0.8

$$1 \left(\frac{143x}{775} + \frac{77}{775} \right) \left(x^2 + \frac{3x}{5} + \frac{2}{5} \right)^{-1} + \frac{82\sqrt{31}}{961} \arctan\left(\frac{(50x + 15)\sqrt{31}}{155}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)/(5*x^2+3*x+2)^2, x)

[Out] (143/775*x+77/775)/(x^2+3/5*x+2/5)+82/961*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))

Maxima [A] time = 0.78835, size = 49, normalized size = 1.14

$$\frac{82}{961} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{11(13x + 7)}{155(5x^2 + 3x + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2, x, algorithm="maxima")

[Out] 82/961*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/155*(13*x + 7)/(5*x^2 + 3*x + 2)

Fricas [A] time = 0.258145, size = 69, normalized size = 1.6

$$\frac{\sqrt{31}\left(410(5x^2 + 3x + 2) \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + 11\sqrt{31}(13x + 7)\right)}{4805(5x^2 + 3x + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")`

[Out] $\frac{1}{4805} \sqrt{31} (410 (5x^2 + 3x + 2) \arctan\left(\frac{1}{31} \sqrt{31} (10x + 3)\right) + 11 \sqrt{31} (13x + 7)) / (5x^2 + 3x + 2)$

Sympy [A] time = 0.174392, size = 42, normalized size = 0.98

$$\frac{143x + 77}{775x^2 + 465x + 310} + \frac{82\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{961}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)/(5*x**2+3*x+2)**2,x)`

[Out] $(143x + 77) / (775x^2 + 465x + 310) + 82 \sqrt{31} \operatorname{atan}(10 \sqrt{31} x / 31 + 3 \sqrt{31} / 31) / 961$

GIAC/XCAS [A] time = 0.264983, size = 49, normalized size = 1.14

$$\frac{82}{961} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31} (10x + 3)\right) + \frac{11(13x + 7)}{155(5x^2 + 3x + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")`

[Out] $\frac{82}{961} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31} (10x + 3)\right) + \frac{11}{155} (13x + 7) / (5x^2 + 3x + 2)$

$$3.21 \quad \int \frac{3-x+2x^2}{(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=64

$$\frac{553(10x+3)}{9610(5x^2+3x+2)} + \frac{11(13x+7)}{310(5x^2+3x+2)^2} + \frac{1106 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

[Out] (11*(7 + 13*x))/(310*(2 + 3*x + 5*x^2)^2) + (553*(3 + 10*x))/(9610*(2 + 3*x + 5*x^2)) + (1106*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sqrt[31])

Rubi [A] time = 0.0659882, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$

$$\frac{553(10x+3)}{9610(5x^2+3x+2)} + \frac{11(13x+7)}{310(5x^2+3x+2)^2} + \frac{1106 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^3, x]

[Out] (11*(7 + 13*x))/(310*(2 + 3*x + 5*x^2)^2) + (553*(3 + 10*x))/(9610*(2 + 3*x + 5*x^2)) + (1106*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sqrt[31])

Rubi in Sympy [A] time = 9.85074, size = 56, normalized size = 0.88

$$\frac{553(10x+3)}{9610(5x^2+3x+2)} + \frac{143x+77}{310(5x^2+3x+2)^2} + \frac{1106\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{29791}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)/(5*x**2+3*x+2)**3, x)

[Out] 553*(10*x + 3)/(9610*(5*x**2 + 3*x + 2)) + (143*x + 77)/(310*(5*x**2 + 3*x + 2)**2) + 1106*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/29791

Mathematica [A] time = 0.0518193, size = 53, normalized size = 0.83

$$\frac{\frac{31(5530x^3+4977x^2+4094x+1141)}{(5x^2+3x+2)^2} + 2212\sqrt{31} \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{59582}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^3, x]

[Out] ((31*(1141 + 4094*x + 4977*x^2 + 5530*x^3))/(2 + 3*x + 5*x^2)^2 + 2212*sqrt[31]*ArcTan[(3 + 10*x)/sqrt[31]])/59582

Maple [A] time = 0.009, size = 47, normalized size = 0.7

$$25 \frac{1}{(5x^2 + 3x + 2)^2} \left(\frac{553x^3}{4805} + \frac{4977x^2}{48050} + \frac{2047x}{24025} + \frac{1141}{48050} \right) + \frac{1106\sqrt{31}}{29791} \arctan\left(\frac{(250x + 75)\sqrt{31}}{775}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)/(5*x^2+3*x+2)^3, x)

[Out] 25*(553/4805*x^3+4977/48050*x^2+2047/24025*x+1141/48050)/(5*x^2+3*x+2)^2+1106/29791*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))

Maxima [A] time = 0.786788, size = 76, normalized size = 1.19

$$\frac{1106}{29791} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{5530x^3 + 4977x^2 + 4094x + 1141}{1922(25x^4 + 30x^3 + 29x^2 + 12x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3, x, algorithm="maxima")

[Out] 1106/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/1922*(5530*x^3 + 4977*x^2 + 4094*x + 1141)/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)

Fricas [A] time = 0.267808, size = 108, normalized size = 1.69

$$\frac{\sqrt{31} \left(2212 (25x^4 + 30x^3 + 29x^2 + 12x + 4) \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \sqrt{31}(5530x^3 + 4977x^2 + 4094x + 1141) \right)}{59582 (25x^4 + 30x^3 + 29x^2 + 12x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3, x, algorithm="fricas")

[Out] 1/59582*sqrt(31)*(2212*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(1/31*sqrt(31)*(10*x + 3)) + sqrt(31)*(5530*x^3 + 4977*x^2 + 4094*x + 1141))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)

Sympy [A] time = 0.225381, size = 63, normalized size = 0.98

$$\frac{5530x^3 + 4977x^2 + 4094x + 1141}{48050x^4 + 57660x^3 + 55738x^2 + 23064x + 7688} + \frac{1106\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{29791}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)/(5*x**2+3*x+2)**3, x)

[Out] (5530*x**3 + 4977*x**2 + 4094*x + 1141)/(48050*x**4 + 57660*x**3 + 55738*x**2 + 23064*x + 7688) + 1106*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/29791

GIAC/XCAS [A] time = 0.264558, size = 62, normalized size = 0.97

$$\frac{1106}{29791} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{5530x^3 + 4977x^2 + 4094x + 1141}{1922(5x^2 + 3x + 2)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3, x, algorithm="giac")

[Out] 1106/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/1922*(5530*x^3 + 4977*x^2 + 4094*x + 1141)/(5*x^2 + 3*x + 2)^2

$$3.22 \quad \int (3 - x + 2x^2)^2 (2 + 3x + 5x^2)^4 dx$$

Optimal. Leaf size=80

$$\begin{aligned} & \frac{2500x^{13}}{13} + \frac{875x^{12}}{3} + \frac{11525x^{11}}{11} + 1571x^{10} + \frac{24859x^9}{9} + 3315x^8 \\ & + \frac{27763x^7}{7} + \frac{10771x^6}{3} + \frac{14801x^5}{5} + 1838x^4 + \frac{3016x^3}{3} + 384x^2 + 144x \end{aligned}$$

[Out] 144*x + 384*x^2 + (3016*x^3)/3 + 1838*x^4 + (14801*x^5)/5 + (10771*x^6)/3 + (27763*x^7)/7 + 3315*x^8 + (24859*x^9)/9 + 1571*x^10 + (11525*x^11)/11 + (875*x^12)/3 + (2500*x^13)/13

Rubi [A] time = 0.0975811, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\begin{aligned} & \frac{2500x^{13}}{13} + \frac{875x^{12}}{3} + \frac{11525x^{11}}{11} + 1571x^{10} + \frac{24859x^9}{9} + 3315x^8 \\ & + \frac{27763x^7}{7} + \frac{10771x^6}{3} + \frac{14801x^5}{5} + 1838x^4 + \frac{3016x^3}{3} + 384x^2 + 144x \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^4, x]

[Out] 144*x + 384*x^2 + (3016*x^3)/3 + 1838*x^4 + (14801*x^5)/5 + (10771*x^6)/3 + (27763*x^7)/7 + 3315*x^8 + (24859*x^9)/9 + 1571*x^10 + (11525*x^11)/11 + (875*x^12)/3 + (2500*x^13)/13

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & \frac{13925x^{11}}{286} - \frac{591x^{10}}{4} + \frac{124337x^9}{936} - \frac{6836x^8}{13} - \frac{135241x^7}{728} - \frac{68531x^6}{78} - \frac{338541x^5}{520} - \frac{12535x^4}{13} \\ & - \frac{170195x^3}{312} - \frac{1935x}{26} + \frac{(120x + 146)(2x^2 - x + 3)^3(5x^2 + 3x + 2)^3}{624} - \frac{19347 \int x dx}{26} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**4, x)

[Out] 13925*x**11/286 - 591*x**10/4 + 124337*x**9/936 - 6836*x**8/13 - 135241*x**7/728 - 68531*x**6/78 - 338541*x**5/520 - 12535*x**4/13

$$- 170195x^{3/312} - 1935x/26 + (120x + 146)(2x^2 - x + 3)^{3*} \\ 3*(5x^2 + 3x + 2)^{3/624} - 19347 \text{Integral}(x, x)/26$$

Mathematica [A] time = 0.00526244, size = 80, normalized size = 1.

$$\frac{2500x^{13}}{13} + \frac{875x^{12}}{3} + \frac{11525x^{11}}{11} + 1571x^{10} + \frac{24859x^9}{9} + 3315x^8 \\ + \frac{27763x^7}{7} + \frac{10771x^6}{3} + \frac{14801x^5}{5} + 1838x^4 + \frac{3016x^3}{3} + 384x^2 + 144x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^4, x]

[Out] 144*x + 384*x^2 + (3016*x^3)/3 + 1838*x^4 + (14801*x^5)/5 + (10771*x^6)/3 + (27763*x^7)/7 + 3315*x^8 + (24859*x^9)/9 + 1571*x^10 + (11525*x^11)/11 + (875*x^12)/3 + (2500*x^13)/13

Maple [A] time = 0.002, size = 65, normalized size = 0.8

$$144x + 384x^2 + \frac{3016x^3}{3} + 1838x^4 + \frac{14801x^5}{5} + \frac{10771x^6}{3} + \frac{27763x^7}{7} \\ + 3315x^8 + \frac{24859x^9}{9} + 1571x^{10} + \frac{11525x^{11}}{11} + \frac{875x^{12}}{3} + \frac{2500x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2*(5*x^2+3*x+2)^4, x)

[Out] 144*x+384*x^2+3016/3*x^3+1838*x^4+14801/5*x^5+10771/3*x^6+27763/7*x^7+3315*x^8+24859/9*x^9+1571*x^10+11525/11*x^11+875/3*x^12+2500/13*x^13

Maxima [A] time = 0.696833, size = 86, normalized size = 1.08

$$\frac{2500}{13}x^{13} + \frac{875}{3}x^{12} + \frac{11525}{11}x^{11} + 1571x^{10} + \frac{24859}{9}x^9 + 3315x^8 \\ + \frac{27763}{7}x^7 + \frac{10771}{3}x^6 + \frac{14801}{5}x^5 + 1838x^4 + \frac{3016}{3}x^3 + 384x^2 + 144x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^2,x, algorithm="maxima")

[Out] 2500/13*x^13 + 875/3*x^12 + 11525/11*x^11 + 1571*x^10 + 24859/9*x^9 + 3315*x^8 + 27763/7*x^7 + 10771/3*x^6 + 14801/5*x^5 + 1838*x^4 + 3016/3*x^3 + 384*x^2 + 144*x

Fricas [A] time = 0.25058, size = 1, normalized size = 0.01

$$\frac{2500}{13}x^{13} + \frac{875}{3}x^{12} + \frac{11525}{11}x^{11} + 1571x^{10} + \frac{24859}{9}x^9 + 3315x^8 + \frac{27763}{7}x^7 + \frac{10771}{3}x^6 + \frac{14801}{5}x^5 + 1838x^4 + \frac{3016}{3}x^3 + 384x^2 + 144x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^2,x, algorithm="fricas")

[Out] 2500/13*x^13 + 875/3*x^12 + 11525/11*x^11 + 1571*x^10 + 24859/9*x^9 + 3315*x^8 + 27763/7*x^7 + 10771/3*x^6 + 14801/5*x^5 + 1838*x^4 + 3016/3*x^3 + 384*x^2 + 144*x

Sympy [A] time = 0.07978, size = 76, normalized size = 0.95

$$\frac{2500x^{13}}{13} + \frac{875x^{12}}{3} + \frac{11525x^{11}}{11} + 1571x^{10} + \frac{24859x^9}{9} + 3315x^8 + \frac{27763x^7}{7} + \frac{10771x^6}{3} + \frac{14801x^5}{5} + 1838x^4 + \frac{3016x^3}{3} + 384x^2 + 144x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**4,x)

[Out] 2500*x**13/13 + 875*x**12/3 + 11525*x**11/11 + 1571*x**10 + 24859*x**9/9 + 3315*x**8 + 27763*x**7/7 + 10771*x**6/3 + 14801*x**5/5 + 1838*x**4 + 3016*x**3/3 + 384*x**2 + 144*x

GIAC/XCAS [A] time = 0.263289, size = 86, normalized size = 1.08

$$\frac{2500}{13}x^{13} + \frac{875}{3}x^{12} + \frac{11525}{11}x^{11} + 1571x^{10} + \frac{24859}{9}x^9 + 3315x^8 + \frac{27763}{7}x^7 + \frac{10771}{3}x^6 + \frac{14801}{5}x^5 + 1838x^4 + \frac{3016}{3}x^3 + 384x^2 + 144x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 2500/13*x^13 + 875/3*x^12 + 11525/11*x^11 + 1571*x^10 + 24859/9*x^9 + 3315*x^8 + 27763/7*x^7 + 10771/3*x^6 + 14801/5*x^5 + 1838*x^4 + 3016/3*x^3 + 384*x^2 + 144*x
```

$$3.23 \quad \int (3 - x + 2x^2)^2 (2 + 3x + 5x^2)^3 dx$$

Optimal. Leaf size=66

$$\frac{500x^{11}}{11} + 40x^{10} + \frac{1865x^9}{9} + \frac{1863x^8}{8} + 444x^7 + 449x^6 + \frac{2693x^5}{5} + \frac{1615x^4}{4} + \frac{914x^3}{3} + 138x^2 + 72x$$

[Out] $72*x + 138*x^2 + (914*x^3)/3 + (1615*x^4)/4 + (2693*x^5)/5 + 449*x^6 + 444*x^7 + (1863*x^8)/8 + (1865*x^9)/9 + 40*x^{10} + (500*x^{11})/11$

Rubi [A] time = 0.0810002, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{500x^{11}}{11} + 40x^{10} + \frac{1865x^9}{9} + \frac{1863x^8}{8} + 444x^7 + 449x^6 + \frac{2693x^5}{5} + \frac{1615x^4}{4} + \frac{914x^3}{3} + 138x^2 + 72x$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3,x]

[Out] $72*x + 138*x^2 + (914*x^3)/3 + (1615*x^4)/4 + (2693*x^5)/5 + 449*x^6 + 444*x^7 + (1863*x^8)/8 + (1865*x^9)/9 + 40*x^{10} + (500*x^{11})/11$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{1363x^9}{99} - \frac{14631x^8}{440} + \frac{14233x^7}{220} - \frac{23809x^6}{220} + \frac{1241x^5}{22} - \frac{26469x^4}{220} - \frac{3593x^3}{132} - \frac{576x}{55} + \frac{(100x + 118)(2x^2 - x + 3)^3(5x^2 + 3x + 2)^2}{440} - \frac{22389 \int x dx}{110}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**3,x)

[Out] $1363*x**9/99 - 14631*x**8/440 + 14233*x**7/220 - 23809*x**6/220 + 1241*x**5/22 - 26469*x**4/220 - 3593*x**3/132 - 576*x/55 + (100*x + 118)*(2*x**2 - x + 3)**3*(5*x**2 + 3*x + 2)**2/440 - 22389*Integral(x, x)/110$

Mathematica [A] time = 0.00485606, size = 66, normalized size = 1.

$$\frac{500x^{11}}{11} + 40x^{10} + \frac{1865x^9}{9} + \frac{1863x^8}{8} + 444x^7 + 449x^6 + \frac{2693x^5}{5} + \frac{1615x^4}{4} + \frac{914x^3}{3} + 138x^2 + 72x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3, x]

[Out] 72*x + 138*x^2 + (914*x^3)/3 + (1615*x^4)/4 + (2693*x^5)/5 + 449*x^6 + 444*x^7 + (1863*x^8)/8 + (1865*x^9)/9 + 40*x^10 + (500*x^11)/11

Maple [A] time = 0.002, size = 55, normalized size = 0.8

$$72x + 138x^2 + \frac{914x^3}{3} + \frac{1615x^4}{4} + \frac{2693x^5}{5} + 449x^6 + 444x^7 + \frac{1863x^8}{8} + \frac{1865x^9}{9} + 40x^{10} + \frac{500x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2*(5*x^2+3*x+2)^3, x)

[Out] 72*x+138*x^2+914/3*x^3+1615/4*x^4+2693/5*x^5+449*x^6+444*x^7+1863/8*x^8+1865/9*x^9+40*x^10+500/11*x^11

Maxima [A] time = 0.69438, size = 73, normalized size = 1.11

$$\frac{500}{11}x^{11} + 40x^{10} + \frac{1865}{9}x^9 + \frac{1863}{8}x^8 + 444x^7 + 449x^6 + \frac{2693}{5}x^5 + \frac{1615}{4}x^4 + \frac{914}{3}x^3 + 138x^2 + 72x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2, x, algorithm="maxima")

[Out] 500/11*x^11 + 40*x^10 + 1865/9*x^9 + 1863/8*x^8 + 444*x^7 + 449*x^6 + 2693/5*x^5 + 1615/4*x^4 + 914/3*x^3 + 138*x^2 + 72*x

Fricas [A] time = 0.230541, size = 1, normalized size = 0.02

$$\frac{500}{11}x^{11} + 40x^{10} + \frac{1865}{9}x^9 + \frac{1863}{8}x^8 + 444x^7 + 449x^6 + \frac{2693}{5}x^5 + \frac{1615}{4}x^4 + \frac{914}{3}x^3 + 138x^2 + 72x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2,x, algorithm="fricas")`

[Out] $500/11*x^{11} + 40*x^{10} + 1865/9*x^9 + 1863/8*x^8 + 444*x^7 + 449*x^6 + 2693/5*x^5 + 1615/4*x^4 + 914/3*x^3 + 138*x^2 + 72*x$

Sympy [A] time = 0.07288, size = 63, normalized size = 0.95

$$\frac{500x^{11}}{11} + 40x^{10} + \frac{1865x^9}{9} + \frac{1863x^8}{8} + 444x^7 + 449x^6 + \frac{2693x^5}{5} + \frac{1615x^4}{4} + \frac{914x^3}{3} + 138x^2 + 72x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**3,x)`

[Out] $500*x^{11}/11 + 40*x^{10} + 1865*x^9/9 + 1863*x^8/8 + 444*x^7 + 449*x^6 + 2693*x^5/5 + 1615*x^4/4 + 914*x^3/3 + 138*x^2 + 72*x$

GIAC/XCAS [A] time = 0.262148, size = 73, normalized size = 1.11

$$\frac{500}{11}x^{11} + 40x^{10} + \frac{1865}{9}x^9 + \frac{1863}{8}x^8 + 444x^7 + 449x^6 + \frac{2693}{5}x^5 + \frac{1615}{4}x^4 + \frac{914}{3}x^3 + 138x^2 + 72x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2,x, algorithm="giac")`

[Out] $500/11*x^{11} + 40*x^{10} + 1865/9*x^9 + 1863/8*x^8 + 444*x^7 + 449*x^6 + 2693/5*x^5 + 1615/4*x^4 + 914/3*x^3 + 138*x^2 + 72*x$

$$3.24 \quad \int (3 - x + 2x^2)^2 (2 + 3x + 5x^2)^2 dx$$

Optimal. Leaf size=54

$$\frac{100x^9}{9} + \frac{5x^8}{2} + \frac{321x^7}{7} + \frac{86x^6}{3} + 78x^5 + 59x^4 + \frac{241x^3}{3} + 42x^2 + 36x$$

[Out] 36*x + 42*x^2 + (241*x^3)/3 + 59*x^4 + 78*x^5 + (86*x^6)/3 + (321*x^7)/7 + (5*x^8)/2 + (100*x^9)/9

Rubi [A] time = 0.0723085, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{100x^9}{9} + \frac{5x^8}{2} + \frac{321x^7}{7} + \frac{86x^6}{3} + 78x^5 + 59x^4 + \frac{241x^3}{3} + 42x^2 + 36x$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2, x]

[Out] 36*x + 42*x^2 + (241*x^3)/3 + 59*x^4 + 78*x^5 + (86*x^6)/3 + (321*x^7)/7 + (5*x^8)/2 + (100*x^9)/9

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{1091x^7}{252} - \frac{551x^6}{72} + \frac{383x^5}{16} - \frac{229x^4}{9} + \frac{439x^3}{12} + \frac{201x}{16} + \frac{(80x + 90)(2x^2 - x + 3)^3(5x^2 + 3x + 2)}{288} - \frac{87 \int x dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**2, x)

[Out] 1091*x**7/252 - 551*x**6/72 + 383*x**5/16 - 229*x**4/9 + 439*x**3/12 + 201*x/16 + (80*x + 90)*(2*x**2 - x + 3)**3*(5*x**2 + 3*x + 2)/288 - 87*Integral(x, x)/2

Mathematica [A] time = 0.00368844, size = 54, normalized size = 1.

$$\frac{100x^9}{9} + \frac{5x^8}{2} + \frac{321x^7}{7} + \frac{86x^6}{3} + 78x^5 + 59x^4 + \frac{241x^3}{3} + 42x^2 + 36x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2,x]

[Out] 36*x + 42*x^2 + (241*x^3)/3 + 59*x^4 + 78*x^5 + (86*x^6)/3 + (321*x^7)/7 + (5*x^8)/2 + (100*x^9)/9

Maple [A] time = 0.001, size = 45, normalized size = 0.8

$$36x + 42x^2 + \frac{241x^3}{3} + 59x^4 + 78x^5 + \frac{86x^6}{3} + \frac{321x^7}{7} + \frac{5x^8}{2} + \frac{100x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2*(5*x^2+3*x+2)^2,x)

[Out] 36*x+42*x^2+241/3*x^3+59*x^4+78*x^5+86/3*x^6+321/7*x^7+5/2*x^8+100/9*x^9

Maxima [A] time = 0.693591, size = 59, normalized size = 1.09

$$\frac{100}{9}x^9 + \frac{5}{2}x^8 + \frac{321}{7}x^7 + \frac{86}{3}x^6 + 78x^5 + 59x^4 + \frac{241}{3}x^3 + 42x^2 + 36x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2,x, algorithm="maxima")

[Out] 100/9*x^9 + 5/2*x^8 + 321/7*x^7 + 86/3*x^6 + 78*x^5 + 59*x^4 + 241/3*x^3 + 42*x^2 + 36*x

Fricas [A] time = 0.235007, size = 1, normalized size = 0.02

$$\frac{100}{9}x^9 + \frac{5}{2}x^8 + \frac{321}{7}x^7 + \frac{86}{3}x^6 + 78x^5 + 59x^4 + \frac{241}{3}x^3 + 42x^2 + 36x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2,x, algorithm="fricas")

[Out] $100/9*x^9 + 5/2*x^8 + 321/7*x^7 + 86/3*x^6 + 78*x^5 + 59*x^4 + 241/3*x^3 + 42*x^2 + 36*x$

Sympy [A] time = 0.062997, size = 51, normalized size = 0.94

$$\frac{100x^9}{9} + \frac{5x^8}{2} + \frac{321x^7}{7} + \frac{86x^6}{3} + 78x^5 + 59x^4 + \frac{241x^3}{3} + 42x^2 + 36x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**2,x)`

[Out] $100*x**9/9 + 5*x**8/2 + 321*x**7/7 + 86*x**6/3 + 78*x**5 + 59*x**4 + 241*x**3/3 + 42*x**2 + 36*x$

GIAC/XCAS [A] time = 0.263692, size = 59, normalized size = 1.09

$$\frac{100}{9}x^9 + \frac{5}{2}x^8 + \frac{321}{7}x^7 + \frac{86}{3}x^6 + 78x^5 + 59x^4 + \frac{241}{3}x^3 + 42x^2 + 36x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2,x, algorithm="giac")`

[Out] $100/9*x^9 + 5/2*x^8 + 321/7*x^7 + 86/3*x^6 + 78*x^5 + 59*x^4 + 241/3*x^3 + 42*x^2 + 36*x$

$$3.25 \quad \int (3 - x + 2x^2)^2 (2 + 3x + 5x^2) dx$$

Optimal. Leaf size=46

$$\frac{20x^7}{7} - \frac{4x^6}{3} + \frac{61x^5}{5} + \frac{x^4}{4} + \frac{53x^3}{3} + \frac{15x^2}{2} + 18x$$

[Out] $18*x + (15*x^2)/2 + (53*x^3)/3 + x^4/4 + (61*x^5)/5 - (4*x^6)/3 + (20*x^7)/7$

Rubi [A] time = 0.0470669, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{20x^7}{7} - \frac{4x^6}{3} + \frac{61x^5}{5} + \frac{x^4}{4} + \frac{53x^3}{3} + \frac{15x^2}{2} + 18x$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2), x]

[Out] $18*x + (15*x^2)/2 + (53*x^3)/3 + x^4/4 + (61*x^5)/5 - (4*x^6)/3 + (20*x^7)/7$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{20x^7}{7} - \frac{4x^6}{3} + \frac{61x^5}{5} + \frac{x^4}{4} + \frac{53x^3}{3} + 18x + 15 \int x dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2), x)

[Out] $20*x**7/7 - 4*x**6/3 + 61*x**5/5 + x**4/4 + 53*x**3/3 + 18*x + 15$
*Integral(x, x)

Mathematica [A] time = 0.00256626, size = 46, normalized size = 1.

$$\frac{20x^7}{7} - \frac{4x^6}{3} + \frac{61x^5}{5} + \frac{x^4}{4} + \frac{53x^3}{3} + \frac{15x^2}{2} + 18x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2), x]

[Out] $18x + \frac{15x^2}{2} + \frac{53x^3}{3} + \frac{x^4}{4} + \frac{61x^5}{5} - \frac{4x^6}{3} + \frac{20x^7}{7}$

Maple [A] time = 0.001, size = 35, normalized size = 0.8

$$18x + \frac{15x^2}{2} + \frac{53x^3}{3} + \frac{x^4}{4} + \frac{61x^5}{5} - \frac{4x^6}{3} + \frac{20x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2*(5*x^2+3*x+2), x)

[Out] $18x + 15/2x^2 + 53/3x^3 + 1/4x^4 + 61/5x^5 - 4/3x^6 + 20/7x^7$

Maxima [A] time = 0.699221, size = 46, normalized size = 1.

$$\frac{20}{7}x^7 - \frac{4}{3}x^6 + \frac{61}{5}x^5 + \frac{1}{4}x^4 + \frac{53}{3}x^3 + \frac{15}{2}x^2 + 18x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2, x, algorithm="maxima")

[Out] $20/7x^7 - 4/3x^6 + 61/5x^5 + 1/4x^4 + 53/3x^3 + 15/2x^2 + 18x$

Fricas [A] time = 0.234106, size = 1, normalized size = 0.02

$$\frac{20}{7}x^7 - \frac{4}{3}x^6 + \frac{61}{5}x^5 + \frac{1}{4}x^4 + \frac{53}{3}x^3 + \frac{15}{2}x^2 + 18x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2, x, algorithm="fricas")

[Out] $20/7x^7 - 4/3x^6 + 61/5x^5 + 1/4x^4 + 53/3x^3 + 15/2x^2 + 18x$

Sympy [A] time = 0.054093, size = 41, normalized size = 0.89

$$\frac{20x^7}{7} - \frac{4x^6}{3} + \frac{61x^5}{5} + \frac{x^4}{4} + \frac{53x^3}{3} + \frac{15x^2}{2} + 18x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**2*(5*x**2+3*x+2),x)`

[Out] `20*x**7/7 - 4*x**6/3 + 61*x**5/5 + x**4/4 + 53*x**3/3 + 15*x**2/2 + 18*x`

GIAC/XCAS [A] time = 0.263107, size = 46, normalized size = 1.

$$\frac{20}{7}x^7 - \frac{4}{3}x^6 + \frac{61}{5}x^5 + \frac{1}{4}x^4 + \frac{53}{3}x^3 + \frac{15}{2}x^2 + 18x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2,x, algorithm="giac")`

[Out] `20/7*x^7 - 4/3*x^6 + 61/5*x^5 + 1/4*x^4 + 53/3*x^3 + 15/2*x^2 + 18*x`

$$3.26 \quad \int \frac{(3-x+2x^2)^2}{2+3x+5x^2} dx$$

Optimal. Leaf size=56

$$\frac{4x^3}{15} - \frac{16x^2}{25} - \frac{1573 \log(5x^2 + 3x + 2)}{1250} + \frac{381x}{125} + \frac{8349 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{625\sqrt{31}}$$

[Out] (381*x)/125 - (16*x^2)/25 + (4*x^3)/15 + (8349*ArcTan[(3 + 10*x)/Sqrt[31]])/(625*Sqrt[31]) - (1573*Log[2 + 3*x + 5*x^2])/1250

Rubi [A] time = 0.0937176, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{4x^3}{15} - \frac{16x^2}{25} - \frac{1573 \log(5x^2 + 3x + 2)}{1250} + \frac{381x}{125} + \frac{8349 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{625\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2), x]

[Out] (381*x)/125 - (16*x^2)/25 + (4*x^3)/15 + (8349*ArcTan[(3 + 10*x)/Sqrt[31]])/(625*Sqrt[31]) - (1573*Log[2 + 3*x + 5*x^2])/1250

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\left(-\frac{2x}{15} + \frac{19}{75}\right)(2x^2 - x + 3) - \frac{1573 \log(5x^2 + 3x + 2)}{1250} + \frac{8349\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{19375} - \frac{\int\left(-\frac{1796}{5}\right) dx}{150}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2), x)

[Out] -(-2*x/15 + 19/75)*(2*x**2 - x + 3) - 1573*log(5*x**2 + 3*x + 2)/1250 + 8349*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/19375 - Integral(-1796/5, x)/150

Mathematica [A] time = 0.0430483, size = 53, normalized size = 0.95

$$\frac{10x(100x^2 - 240x + 1143) - 4719 \log(5x^2 + 3x + 2)}{3750} + \frac{8349 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{625\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2), x]

[Out] (8349*ArcTan[(3 + 10*x)/Sqrt[31]])/(625*Sqrt[31]) + (10*x*(1143 - 240*x + 100*x^2) - 4719*Log[2 + 3*x + 5*x^2])/3750

Maple [A] time = 0.005, size = 44, normalized size = 0.8

$$\frac{381x}{125} - \frac{16x^2}{25} + \frac{4x^3}{15} - \frac{1573 \ln(5x^2 + 3x + 2)}{1250} + \frac{8349\sqrt{31}}{19375} \arctan\left(\frac{(3 + 10x)\sqrt{31}}{31}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2/(5*x^2+3*x+2), x)

[Out] 381/125*x-16/25*x^2+4/15*x^3-1573/1250*ln(5*x^2+3*x+2)+8349/19375*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/2)

Maxima [A] time = 0.770752, size = 58, normalized size = 1.04

$$\frac{4}{15}x^3 - \frac{16}{25}x^2 + \frac{8349}{19375}\sqrt{31} \arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{381}{125}x - \frac{1573}{1250} \log(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2), x, algorithm="maxima")

[Out] 4/15*x^3 - 16/25*x^2 + 8349/19375*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 381/125*x - 1573/1250*log(5*x^2 + 3*x + 2)

Fricas [A] time = 0.257687, size = 73, normalized size = 1.3

$$\frac{1}{116250} \sqrt{31} \left(10 \sqrt{31} (100x^3 - 240x^2 + 1143x) - 4719 \sqrt{31} \log(5x^2 + 3x + 2) + 50094 \arctan\left(\frac{1}{31} \sqrt{31} (10x + 3)\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2),x, algorithm="fricas")`

[Out] $1/116250*\sqrt{31}*(10*\sqrt{31}*(100*x^3 - 240*x^2 + 1143*x) - 4719*\sqrt{31}*\log(5*x^2 + 3*x + 2) + 50094*\arctan(1/31*\sqrt{31}*(10*x + 3)))$

Sympy [A] time = 0.148787, size = 63, normalized size = 1.12

$$\frac{4x^3}{15} - \frac{16x^2}{25} + \frac{381x}{125} - \frac{1573 \log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{1250} + \frac{8349\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{19375}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**2/(5*x**2+3*x+2),x)`

[Out] $4*x**3/15 - 16*x**2/25 + 381*x/125 - 1573*\log(x**2 + 3*x/5 + 2/5)/1250 + 8349*\sqrt{31}*\operatorname{atan}(10*\sqrt{31}*x/31 + 3*\sqrt{31}/31)/19375$

GIAC/XCAS [A] time = 0.265185, size = 58, normalized size = 1.04

$$\frac{4}{15}x^3 - \frac{16}{25}x^2 + \frac{8349}{19375}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{381}{125}x - \frac{1573}{1250}\ln(5x^2+3x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2),x, algorithm="giac")`

[Out] $4/15*x^3 - 16/25*x^2 + 8349/19375*\sqrt{31}*\arctan(1/31*\sqrt{31}*(10*x + 3)) + 381/125*x - 1573/1250*\ln(5*x^2 + 3*x + 2)$

$$3.27 \quad \int \frac{(3-x+2x^2)^2}{(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=63

$$\frac{121(69x+61)}{3875(5x^2+3x+2)} - \frac{22}{125} \log(5x^2+3x+2) + \frac{4x}{25} + \frac{41932 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{3875\sqrt{31}}$$

[Out] (4*x)/25 + (121*(61 + 69*x))/(3875*(2 + 3*x + 5*x^2)) + (41932*ArcTan[(3 + 10*x)/Sqrt[31]])/(3875*Sqrt[31]) - (22*Log[2 + 3*x + 5*x^2])/125

Rubi [A] time = 0.110633, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(69x+61)}{3875(5x^2+3x+2)} - \frac{22}{125} \log(5x^2+3x+2) + \frac{4x}{25} + \frac{41932 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{3875\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^2, x]

[Out] (4*x)/25 + (121*(61 + 69*x))/(3875*(2 + 3*x + 5*x^2)) + (41932*ArcTan[(3 + 10*x)/Sqrt[31]])/(3875*Sqrt[31]) - (22*Log[2 + 3*x + 5*x^2])/125

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & -\frac{8x^3}{31} + \frac{(10x+3)(2x^2-x+3)^2}{31(5x^2+3x+2)} - \frac{22 \log(5x^2+3x+2)}{125} \\ & + \frac{41932\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{120125} - \frac{\int \frac{542}{25} dx}{31} + \frac{104 \int x dx}{155} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**2, x)

[Out] -8*x**3/31 + (10*x + 3)*(2*x**2 - x + 3)**2/(31*(5*x**2 + 3*x + 2)) - 22*log(5*x**2 + 3*x + 2)/125 + 41932*sqrt(31)*atan(sqrt(31)*

$(10*x/31 + 3/31))/120125 - \text{Integral}(542/25, x)/31 + 104*\text{Integral}(x, x)/155$

Mathematica [A] time = 0.0554694, size = 59, normalized size = 0.94

$$\frac{\frac{3751(69x+61)}{5x^2+3x+2} - 21142 \log(5x^2 + 3x + 2) + 19220x + 41932\sqrt{31} \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{120125}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^2, x]

[Out] (19220*x + (3751*(61 + 69*x))/(2 + 3*x + 5*x^2) + 41932*Sqrt[31]*ArcTan[(3 + 10*x)/Sqrt[31]] - 21142*Log[2 + 3*x + 5*x^2])/120125

Maple [A] time = 0.009, size = 51, normalized size = 0.8

$$\frac{4x}{25} - \frac{11}{25} \left(-\frac{759x}{775} - \frac{671}{775} \right) \left(x^2 + \frac{3x}{5} + \frac{2}{5} \right)^{-1} - \frac{22 \ln(25x^2 + 15x + 10)}{125} + \frac{41932\sqrt{31}}{120125} \arctan\left(\frac{(50x+15)\sqrt{31}}{155}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2/(5*x^2+3*x+2)^2, x)

[Out] 4/25*x-11/25*(-759/775*x-671/775)/(x^2+3/5*x+2/5)-22/125*ln(25*x^2+15*x+10)+41932/120125*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))

Maxima [A] time = 0.775687, size = 70, normalized size = 1.11

$$\frac{41932}{120125} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) + \frac{4}{25}x + \frac{121(69x+61)}{3875(5x^2+3x+2)} - \frac{22}{125} \log(5x^2+3x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^2, x, algorithm="maxima")

[Out] $41932/120125 \sqrt{31} \arctan(1/31 \sqrt{31} (10x + 3)) + 4/25 x + 121/3875 (69x + 61)/(5x^2 + 3x + 2) - 22/125 \log(5x^2 + 3x + 2)$

Fricas [A] time = 0.259865, size = 117, normalized size = 1.86

$$\frac{\sqrt{31} \left(682 \sqrt{31} (5x^2 + 3x + 2) \log(5x^2 + 3x + 2) - 41932 (5x^2 + 3x + 2) \arctan\left(\frac{1}{31} \sqrt{31} (10x + 3)\right) - \sqrt{31} (3100x^3 + 1860x^2 + 9589x + 7381) \right)}{120125 (5x^2 + 3x + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^2, x, algorithm="fricas")`

[Out] $-1/120125 \sqrt{31} (682 \sqrt{31} (5x^2 + 3x + 2) \log(5x^2 + 3x + 2) - 41932 (5x^2 + 3x + 2) \arctan(1/31 \sqrt{31} (10x + 3)) - \sqrt{31} (3100x^3 + 1860x^2 + 9589x + 7381))/(5x^2 + 3x + 2)$

Sympy [A] time = 0.209593, size = 65, normalized size = 1.03

$$\frac{4x}{25} + \frac{8349x + 7381}{19375x^2 + 11625x + 7750} - \frac{22 \log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{125} + \frac{41932 \sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{120125}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**2, x)`

[Out] $4x/25 + (8349x + 7381)/(19375x^2 + 11625x + 7750) - 22 \log(x^2 + 3x/5 + 2/5)/125 + 41932 \sqrt{31} \operatorname{atan}(10 \sqrt{31} x/31 + 3 \sqrt{31}/31)/120125$

GIAC/XCAS [A] time = 0.264785, size = 70, normalized size = 1.11

$$\frac{41932}{120125} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31} (10x + 3)\right) + \frac{4}{25} x + \frac{121(69x + 61)}{3875(5x^2 + 3x + 2)} - \frac{22}{125} \ln(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^2, x, algorithm="giac")`

```
[Out] 41932/120125*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 4/25*x +  
121/3875*(69*x + 61)/(5*x^2 + 3*x + 2) - 22/125*ln(5*x^2 + 3*x +  
2)
```

$$3.28 \quad \int \frac{(3-x+2x^2)^2}{(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=64

$$\frac{121(69x + 61)}{7750(5x^2 + 3x + 2)^2} + \frac{11(45710x + 17557)}{240250(5x^2 + 3x + 2)} + \frac{4330 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

[Out] (121*(61 + 69*x))/(7750*(2 + 3*x + 5*x^2)^2) + (11*(17557 + 45710*x))/(240250*(2 + 3*x + 5*x^2)) + (4330*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sqrt[31])

Rubi [A] time = 0.0937121, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{121(69x + 61)}{7750(5x^2 + 3x + 2)^2} + \frac{11(45710x + 17557)}{240250(5x^2 + 3x + 2)} + \frac{4330 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^3, x]

[Out] (121*(61 + 69*x))/(7750*(2 + 3*x + 5*x^2)^2) + (11*(17557 + 45710*x))/(240250*(2 + 3*x + 5*x^2)) + (4330*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sqrt[31])

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{(10x + 3)(2x^2 - x + 3)^2}{62(5x^2 + 3x + 2)^2} + \frac{22(1712x + 1053)}{24025(5x^2 + 3x + 2)} + \frac{4330\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{29791} - \frac{\int \frac{8}{5} dx}{62}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**3, x)

[Out] (10*x + 3)*(2*x**2 - x + 3)**2/(62*(5*x**2 + 3*x + 2)**2) + 22*(1712*x + 1053)/(24025*(5*x**2 + 3*x + 2)) + 4330*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/29791 - Integral(8/5, x)/62

Mathematica [A] time = 0.0513349, size = 53, normalized size = 0.83

$$\frac{11(45710x^3 + 44983x^2 + 33524x + 11183)}{48050(5x^2 + 3x + 2)^2} + \frac{4330 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^3, x]

[Out] (11*(11183 + 33524*x + 44983*x^2 + 45710*x^3))/(48050*(2 + 3*x + 5*x^2)^2) + (4330*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sqrt[31])

Maple [A] time = 0.008, size = 47, normalized size = 0.7

$$25 \frac{1}{(5x^2 + 3x + 2)^2} \left(\frac{50281x^3}{120125} + \frac{494813x^2}{1201250} + \frac{184382x}{600625} + \frac{123013}{1201250} \right) + \frac{4330\sqrt{31}}{29791} \arctan\left(\frac{(250x + 75)\sqrt{31}}{775}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2/(5*x^2+3*x+2)^3, x)

[Out] 25*(50281/120125*x^3+494813/1201250*x^2+184382/600625*x+123013/1201250)/(5*x^2+3*x+2)^2+4330/29791*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))

Maxima [A] time = 0.771819, size = 76, normalized size = 1.19

$$\frac{4330}{29791} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{11(45710x^3 + 44983x^2 + 33524x + 11183)}{48050(25x^4 + 30x^3 + 29x^2 + 12x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^3, x, algorithm="maxima")

[Out] 4330/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/48050*(45710*x^3 + 44983*x^2 + 33524*x + 11183)/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)

Fricas [A] time = 0.258176, size = 109, normalized size = 1.7

$$\frac{\sqrt{31} \left(216500 (25x^4 + 30x^3 + 29x^2 + 12x + 4) \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + 11 \sqrt{31} (45710x^3 + 44983x^2 + 33524x + 11183) \right)}{1489550 (25x^4 + 30x^3 + 29x^2 + 12x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")

[Out] 1/1489550*sqrt(31)*(216500*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11*sqrt(31)*(45710*x^3 + 44983*x^2 + 33524*x + 11183))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)

Sympy [A] time = 0.2428, size = 63, normalized size = 0.98

$$\frac{502810x^3 + 494813x^2 + 368764x + 123013}{1201250x^4 + 1441500x^3 + 1393450x^2 + 576600x + 192200} + \frac{4330\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{29791}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)

[Out] (502810*x**3 + 494813*x**2 + 368764*x + 123013)/(1201250*x**4 + 1441500*x**3 + 1393450*x**2 + 576600*x + 192200) + 4330*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/29791

GIAC/XCAS [A] time = 0.265557, size = 62, normalized size = 0.97

$$\frac{4330}{29791} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{11 (45710x^3 + 44983x^2 + 33524x + 11183)}{48050 (5x^2 + 3x + 2)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")

[Out] 4330/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/48050*(45710*x^3 + 44983*x^2 + 33524*x + 11183)/(5*x^2 + 3*x + 2)^2

$$3.29 \quad \int \frac{(3-x+2x^2)^2}{(2+3x+5x^2)^4} dx$$

Optimal. Leaf size=85

$$\frac{16688(10x+3)}{148955(5x^2+3x+2)} + \frac{11(12060x+4579)}{120125(5x^2+3x+2)^2} + \frac{121(69x+61)}{11625(5x^2+3x+2)^3} + \frac{66752 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{29791\sqrt{31}}$$

[Out] (121*(61 + 69*x))/(11625*(2 + 3*x + 5*x^2)^3) + (11*(4579 + 12060*x))/(120125*(2 + 3*x + 5*x^2)^2) + (16688*(3 + 10*x))/(148955*(2 + 3*x + 5*x^2)) + (66752*ArcTan[(3 + 10*x)/Sqrt[31]])/(29791*Sqrt[31])

Rubi [A] time = 0.112044, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{16688(10x+3)}{148955(5x^2+3x+2)} + \frac{11(12060x+4579)}{120125(5x^2+3x+2)^2} + \frac{121(69x+61)}{11625(5x^2+3x+2)^3} + \frac{66752 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{29791\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^4, x]

[Out] (121*(61 + 69*x))/(11625*(2 + 3*x + 5*x^2)^3) + (11*(4579 + 12060*x))/(120125*(2 + 3*x + 5*x^2)^2) + (16688*(3 + 10*x))/(148955*(2 + 3*x + 5*x^2)) + (66752*ArcTan[(3 + 10*x)/Sqrt[31]])/(29791*Sqrt[31])

Rubi in Sympy [A] time = 49.8025, size = 100, normalized size = 1.18

$$\frac{(10x+3)(2x^2-x+3)^2}{93(5x^2+3x+2)^3} + \frac{54362(10x+3)}{744775(5x^2+3x+2)} + \frac{22(2471x+1724)}{72075(5x^2+3x+2)^2} + \frac{2(13450x+5399)}{72075(5x^2+3x+2)} + \frac{66752\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{923521}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**4, x)

[Out] $(10x + 3) \cdot (2x^2 - x + 3)^2 / (93 \cdot (5x^2 + 3x + 2)^3) + 54362 \cdot (10x + 3) / (744775 \cdot (5x^2 + 3x + 2)) + 22 \cdot (2471x + 1724) / (72075 \cdot (5x^2 + 3x + 2)^2) + 2 \cdot (13450x + 5399) / (72075 \cdot (5x^2 + 3x + 2)) + 66752 \cdot \sqrt{31} \cdot \operatorname{atan}(\sqrt{31} \cdot (10x/31 + 3/31)) / 923521$

Mathematica [A] time = 0.0861477, size = 63, normalized size = 0.74

$$\frac{12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239}{446865(5x^2 + 3x + 2)^3} + \frac{66752 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{29791\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^4, x]

[Out] $(1259239 + 5674908x + 12780597x^2 + 21491796x^3 + 18774000x^4 + 12516000x^5) / (446865(2 + 3x + 5x^2)^3) + (66752 \cdot \operatorname{ArcTan}[(3 + 10x) / \sqrt{31}]) / (29791 \cdot \sqrt{31})$

Maple [A] time = 0.011, size = 57, normalized size = 0.7

$$125 \frac{1}{(5x^2 + 3x + 2)^3} \left(\frac{33376x^5}{148955} + \frac{50064x^4}{148955} + \frac{7163932x^3}{18619375} + \frac{4260199x^2}{18619375} + \frac{1891636x}{18619375} + \frac{1259239}{55858125} \right) + \frac{66752\sqrt{31}}{923521} \arctan\left(\frac{(1250x + 375)\sqrt{31}}{3875}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^2/(5*x^2+3*x+2)^4, x)

[Out] $125 \cdot (33376/148955 \cdot x^5 + 50064/148955 \cdot x^4 + 7163932/18619375 \cdot x^3 + 4260199/18619375 \cdot x^2 + 1891636/18619375 \cdot x + 1259239/55858125) / (5 \cdot x^2 + 3 \cdot x + 2)^3 + 66752/923521 \cdot 31^{1/2} \cdot \arctan(1/3875 \cdot (1250 \cdot x + 375) \cdot 31^{1/2})$

Maxima [A] time = 0.767763, size = 103, normalized size = 1.21

$$\frac{66752}{923521} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239}{446865(125x^6 + 225x^5 + 285x^4 + 207x^3 + 114x^2 + 36x + 8)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^4,x, algorithm="maxima")`

[Out] $66752/923521 \cdot \sqrt{31} \cdot \arctan(1/31 \cdot \sqrt{31} \cdot (10x + 3)) + 1/446865 \cdot (12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239) / (125x^6 + 225x^5 + 285x^4 + 207x^3 + 114x^2 + 36x + 8)$

Fricas [A] time = 0.26565, size = 149, normalized size = 1.75

$$\frac{\sqrt{31} \left(1001280 (125x^6 + 225x^5 + 285x^4 + 207x^3 + 114x^2 + 36x + 8) \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \sqrt{31}(12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239) \right)}{13852815 (125x^6 + 225x^5 + 285x^4 + 207x^3 + 114x^2 + 36x + 8)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^4,x, algorithm="fricas")`

[Out] $1/13852815 \cdot \sqrt{31} \cdot (1001280 \cdot (125x^6 + 225x^5 + 285x^4 + 207x^3 + 114x^2 + 36x + 8) \cdot \arctan(1/31 \cdot \sqrt{31} \cdot (10x + 3)) + \sqrt{31} \cdot (12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239)) / (125x^6 + 225x^5 + 285x^4 + 207x^3 + 114x^2 + 36x + 8)$

Sympy [A] time = 0.291172, size = 83, normalized size = 0.98

$$\frac{12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239}{55858125x^6 + 100544625x^5 + 127356525x^4 + 92501055x^3 + 50942610x^2 + 16087140x + 3574920} + \frac{66752\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{923521}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**4,x)`

[Out] $(12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239) / (55858125x^6 + 100544625x^5 + 127356525x^4 + 92501055x^3 + 50942610x^2 + 16087140x + 3574920) + 66752 \cdot \sqrt{31} \cdot \operatorname{atan}(10 \cdot \sqrt{31} \cdot x / 31 + 3 \cdot \sqrt{31} / 31) / 923521$

GIAC/XCAS [A] time = 0.263303, size = 76, normalized size = 0.89

$$\frac{66752}{923521} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239}{446865(5x^2 + 3x + 2)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^4,x, algorithm="giac")

[Out] 66752/923521*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/446865*(12516000*x^5 + 18774000*x^4 + 21491796*x^3 + 12780597*x^2 + 5674908*x + 1259239)/(5*x^2 + 3*x + 2)^3

$$3.30 \quad \int (3 - x + 2x^2)^3 (2 + 3x + 5x^2)^4 dx$$

Optimal. Leaf size=96

$$\begin{aligned} & \frac{1000x^{15}}{3} + \frac{2250x^{14}}{7} + \frac{27050x^{13}}{13} + \frac{30395x^{12}}{12} + \frac{68583x^{11}}{11} + \frac{75311x^{10}}{10} + \frac{103583x^9}{9} \\ & + \frac{94881x^8}{8} + \frac{91349x^7}{7} + \frac{64529x^6}{6} + \frac{43083x^5}{5} + 5144x^4 + 2856x^3 + 1080x^2 + 432x \end{aligned}$$

[Out] 432*x + 1080*x^2 + 2856*x^3 + 5144*x^4 + (43083*x^5)/5 + (64529*x^6)/6 + (91349*x^7)/7 + (94881*x^8)/8 + (103583*x^9)/9 + (75311*x^10)/10 + (68583*x^11)/11 + (30395*x^12)/12 + (27050*x^13)/13 + (2250*x^14)/7 + (1000*x^15)/3

Rubi [A] time = 0.127977, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\begin{aligned} & \frac{1000x^{15}}{3} + \frac{2250x^{14}}{7} + \frac{27050x^{13}}{13} + \frac{30395x^{12}}{12} + \frac{68583x^{11}}{11} + \frac{75311x^{10}}{10} + \frac{103583x^9}{9} \\ & + \frac{94881x^8}{8} + \frac{91349x^7}{7} + \frac{64529x^6}{6} + \frac{43083x^5}{5} + 5144x^4 + 2856x^3 + 1080x^2 + 432x \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^4, x]

[Out] 432*x + 1080*x^2 + 2856*x^3 + 5144*x^4 + (43083*x^5)/5 + (64529*x^6)/6 + (91349*x^7)/7 + (94881*x^8)/8 + (103583*x^9)/9 + (75311*x^10)/10 + (68583*x^11)/11 + (30395*x^12)/12 + (27050*x^13)/13 + (2250*x^14)/7 + (1000*x^15)/3

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & \frac{26860x^{13}}{273} - \frac{19391x^{12}}{84} + \frac{453247x^{11}}{770} - \frac{125153x^{10}}{120} + \frac{336929x^9}{360} - \frac{65529x^8}{35} \\ & + \frac{14419x^7}{120} - \frac{618133x^6}{280} - \frac{224143x^5}{280} - \frac{226157x^4}{120} - \frac{221671x^3}{280} - \frac{5193x^2}{70} \\ & + \frac{(140x + 163)(2x^2 - x + 3)^4(5x^2 + 3x + 2)^3}{840} - \frac{100593 \int x dx}{70} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**4,x)`

[Out] $26860x^{13}/273 - 19391x^{12}/84 + 453247x^{11}/770 - 125153x^{10}/120 + 336929x^9/360 - 65529x^8/35 + 14419x^7/120 - 618133x^6/280 - 224143x^5/280 - 226157x^4/120 - 221671x^3/280 - 5193x/70 + (140x + 163)(2x^2 - x + 3)^4(5x^2 + 3x + 2)^3/840 - 100593 \text{Integral}(x, x)/70$

Mathematica [A] time = 0.00536835, size = 96, normalized size = 1.

$$\frac{1000x^{15}}{3} + \frac{2250x^{14}}{7} + \frac{27050x^{13}}{13} + \frac{30395x^{12}}{12} + \frac{68583x^{11}}{11} + \frac{75311x^{10}}{10} + \frac{103583x^9}{9} + \frac{94881x^8}{8} + \frac{91349x^7}{7} + \frac{64529x^6}{6} + \frac{43083x^5}{5} + 5144x^4 + 2856x^3 + 1080x^2 + 432x$$

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^4,x]`

[Out] $432x + 1080x^2 + 2856x^3 + 5144x^4 + (43083x^5)/5 + (64529x^6)/6 + (91349x^7)/7 + (94881x^8)/8 + (103583x^9)/9 + (75311x^{10})/10 + (68583x^{11})/11 + (30395x^{12})/12 + (27050x^{13})/13 + (2250x^{14})/7 + (1000x^{15})/3$

Maple [A] time = 0.002, size = 75, normalized size = 0.8

$$432x + 1080x^2 + 2856x^3 + 5144x^4 + \frac{43083x^5}{5} + \frac{64529x^6}{6} + \frac{91349x^7}{7} + \frac{94881x^8}{8} + \frac{103583x^9}{9} + \frac{75311x^{10}}{10} + \frac{68583x^{11}}{11} + \frac{30395x^{12}}{12} + \frac{27050x^{13}}{13} + \frac{2250x^{14}}{7} + \frac{1000x^{15}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)^3*(5*x^2+3*x+2)^4,x)`

[Out] $432x + 1080x^2 + 2856x^3 + 5144x^4 + 43083/5x^5 + 64529/6x^6 + 91349/7x^7 + 94881/8x^8 + 103583/9x^9 + 75311/10x^{10} + 68583/11x^{11} + 30395/12x^{12} + 27050/13x^{13} + 2250/7x^{14} + 1000/3x^{15}$

Maxima [A] time = 0.689604, size = 100, normalized size = 1.04

$$\frac{1000}{3}x^{15} + \frac{2250}{7}x^{14} + \frac{27050}{13}x^{13} + \frac{30395}{12}x^{12} + \frac{68583}{11}x^{11} + \frac{75311}{10}x^{10} + \frac{103583}{9}x^9 + \frac{94881}{8}x^8 + \frac{91349}{7}x^7 + \frac{64529}{6}x^6 + \frac{43083}{5}x^5 + 5144x^4 + 2856x^3 + 1080x^2 + 432x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^3,x, algorithm="maxima")

[Out] 1000/3*x^15 + 2250/7*x^14 + 27050/13*x^13 + 30395/12*x^12 + 68583/11*x^11 + 75311/10*x^10 + 103583/9*x^9 + 94881/8*x^8 + 91349/7*x^7 + 64529/6*x^6 + 43083/5*x^5 + 5144*x^4 + 2856*x^3 + 1080*x^2 + 432*x

Fricas [A] time = 0.234892, size = 1, normalized size = 0.01

$$\frac{1000}{3}x^{15} + \frac{2250}{7}x^{14} + \frac{27050}{13}x^{13} + \frac{30395}{12}x^{12} + \frac{68583}{11}x^{11} + \frac{75311}{10}x^{10} + \frac{103583}{9}x^9 + \frac{94881}{8}x^8 + \frac{91349}{7}x^7 + \frac{64529}{6}x^6 + \frac{43083}{5}x^5 + 5144x^4 + 2856x^3 + 1080x^2 + 432x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^3,x, algorithm="fricas")

[Out] 1000/3*x^15 + 2250/7*x^14 + 27050/13*x^13 + 30395/12*x^12 + 68583/11*x^11 + 75311/10*x^10 + 103583/9*x^9 + 94881/8*x^8 + 91349/7*x^7 + 64529/6*x^6 + 43083/5*x^5 + 5144*x^4 + 2856*x^3 + 1080*x^2 + 432*x

Sympy [A] time = 0.089148, size = 92, normalized size = 0.96

$$\frac{1000x^{15}}{3} + \frac{2250x^{14}}{7} + \frac{27050x^{13}}{13} + \frac{30395x^{12}}{12} + \frac{68583x^{11}}{11} + \frac{75311x^{10}}{10} + \frac{103583x^9}{9} + \frac{94881x^8}{8} + \frac{91349x^7}{7} + \frac{64529x^6}{6} + \frac{43083x^5}{5} + 5144x^4 + 2856x^3 + 1080x^2 + 432x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**4,x)

```
[Out] 1000*x**15/3 + 2250*x**14/7 + 27050*x**13/13 + 30395*x**12/12 + 6
8583*x**11/11 + 75311*x**10/10 + 103583*x**9/9 + 94881*x**8/8 + 9
1349*x**7/7 + 64529*x**6/6 + 43083*x**5/5 + 5144*x**4 + 2856*x**3
+ 1080*x**2 + 432*x
```

GIAC/XCAS [A] time = 0.263652, size = 100, normalized size = 1.04

$$\frac{1000}{3}x^{15} + \frac{2250}{7}x^{14} + \frac{27050}{13}x^{13} + \frac{30395}{12}x^{12} + \frac{68583}{11}x^{11} + \frac{75311}{10}x^{10} + \frac{103583}{9}x^9 + \frac{94881}{8}x^8 + \frac{91349}{7}x^7 + \frac{64529}{6}x^6 + \frac{43083}{5}x^5 + 5144x^4 + 2856x^3 + 1080x^2 + 432x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 1000/3*x^15 + 2250/7*x^14 + 27050/13*x^13 + 30395/12*x^12 + 68583
/11*x^11 + 75311/10*x^10 + 103583/9*x^9 + 94881/8*x^8 + 91349/7*x
^7 + 64529/6*x^6 + 43083/5*x^5 + 5144*x^4 + 2856*x^3 + 1080*x^2 +
432*x
```


$$3.31 \quad \int (3 - x + 2x^2)^3 (2 + 3x + 5x^2)^3 dx$$

Optimal. Leaf size=82

$$\begin{aligned} & \frac{1000x^{13}}{13} + 25x^{12} + \frac{4830x^{11}}{11} + \frac{3061x^{10}}{10} + \frac{3316x^9}{3} + \frac{7869x^8}{8} \\ & + \frac{12016x^7}{7} + \frac{2873x^6}{2} + \frac{8292x^5}{5} + \frac{4483x^4}{4} + 870x^3 + 378x^2 + 216x \end{aligned}$$

[Out] 216*x + 378*x^2 + 870*x^3 + (4483*x^4)/4 + (8292*x^5)/5 + (2873*x^6)/2 + (12016*x^7)/7 + (7869*x^8)/8 + (3316*x^9)/3 + (3061*x^10)/10 + (4830*x^11)/11 + 25*x^12 + (1000*x^13)/13

Rubi [A] time = 0.106771, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\begin{aligned} & \frac{1000x^{13}}{13} + 25x^{12} + \frac{4830x^{11}}{11} + \frac{3061x^{10}}{10} + \frac{3316x^9}{3} + \frac{7869x^8}{8} \\ & + \frac{12016x^7}{7} + \frac{2873x^6}{2} + \frac{8292x^5}{5} + \frac{4483x^4}{4} + 870x^3 + 378x^2 + 216x \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3, x]

[Out] 216*x + 378*x^2 + 870*x^3 + (4483*x^4)/4 + (8292*x^5)/5 + (2873*x^6)/2 + (12016*x^7)/7 + (7869*x^8)/8 + (3316*x^9)/3 + (3061*x^10)/10 + (4830*x^11)/11 + 25*x^12 + (1000*x^13)/13

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & \frac{3830x^{11}}{143} - \frac{3616x^{10}}{65} + \frac{7318x^9}{39} - \frac{52491x^8}{208} + \frac{296929x^7}{728} - \frac{79743x^6}{208} + \frac{43367x^5}{130} - \frac{58499x^4}{208} \\ & + \frac{11235x^3}{104} + \frac{1917x}{52} + \frac{(120x + 135)(2x^2 - x + 3)^4(5x^2 + 3x + 2)^2}{624} - \frac{2997 \int x dx}{8} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**3, x)

[Out] 3830*x**11/143 - 3616*x**10/65 + 7318*x**9/39 - 52491*x**8/208 + 296929*x**7/728 - 79743*x**6/208 + 43367*x**5/130 - 58499*x**4/208

$$8 + 11235x^{3/104} + 1917x/52 + (120x + 135)(2x^2 - x + 3)^4(5x^2 + 3x + 2)^2/624 - 2997 \text{Integral}(x, x)/8$$

Mathematica [A] time = 0.00342286, size = 82, normalized size = 1.

$$\frac{1000x^{13}}{13} + 25x^{12} + \frac{4830x^{11}}{11} + \frac{3061x^{10}}{10} + \frac{3316x^9}{3} + \frac{7869x^8}{8} + \frac{12016x^7}{7} + \frac{2873x^6}{2} + \frac{8292x^5}{5} + \frac{4483x^4}{4} + 870x^3 + 378x^2 + 216x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3, x]

[Out] 216*x + 378*x^2 + 870*x^3 + (4483*x^4)/4 + (8292*x^5)/5 + (2873*x^6)/2 + (12016*x^7)/7 + (7869*x^8)/8 + (3316*x^9)/3 + (3061*x^10)/10 + (4830*x^11)/11 + 25*x^12 + (1000*x^13)/13

Maple [A] time = 0.002, size = 65, normalized size = 0.8

$$216x + 378x^2 + 870x^3 + \frac{4483x^4}{4} + \frac{8292x^5}{5} + \frac{2873x^6}{2} + \frac{12016x^7}{7} + \frac{7869x^8}{8} + \frac{3316x^9}{3} + \frac{3061x^{10}}{10} + \frac{4830x^{11}}{11} + 25x^{12} + \frac{1000x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^3*(5*x^2+3*x+2)^3, x)

[Out] 216*x+378*x^2+870*x^3+4483/4*x^4+8292/5*x^5+2873/2*x^6+12016/7*x^7+7869/8*x^8+3316/3*x^9+3061/10*x^10+4830/11*x^11+25*x^12+1000/13*x^13

Maxima [A] time = 0.699519, size = 86, normalized size = 1.05

$$\frac{1000}{13}x^{13} + 25x^{12} + \frac{4830}{11}x^{11} + \frac{3061}{10}x^{10} + \frac{3316}{3}x^9 + \frac{7869}{8}x^8 + \frac{12016}{7}x^7 + \frac{2873}{2}x^6 + \frac{8292}{5}x^5 + \frac{4483}{4}x^4 + 870x^3 + 378x^2 + 216x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3,x, algorithm="maxima")

[Out] 1000/13*x^13 + 25*x^12 + 4830/11*x^11 + 3061/10*x^10 + 3316/3*x^9
 + 7869/8*x^8 + 12016/7*x^7 + 2873/2*x^6 + 8292/5*x^5 + 4483/4*x^4
 + 870*x^3 + 378*x^2 + 216*x

Fricas [A] time = 0.234223, size = 1, normalized size = 0.01

$$\frac{1000}{13}x^{13} + 25x^{12} + \frac{4830}{11}x^{11} + \frac{3061}{10}x^{10} + \frac{3316}{3}x^9 + \frac{7869}{8}x^8$$

$$+ \frac{12016}{7}x^7 + \frac{2873}{2}x^6 + \frac{8292}{5}x^5 + \frac{4483}{4}x^4 + 870x^3 + 378x^2 + 216x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3,x, algorithm="fricas")

[Out] 1000/13*x^13 + 25*x^12 + 4830/11*x^11 + 3061/10*x^10 + 3316/3*x^9
 + 7869/8*x^8 + 12016/7*x^7 + 2873/2*x^6 + 8292/5*x^5 + 4483/4*x^4
 + 870*x^3 + 378*x^2 + 216*x

Sympy [A] time = 0.074609, size = 78, normalized size = 0.95

$$\frac{1000x^{13}}{13} + 25x^{12} + \frac{4830x^{11}}{11} + \frac{3061x^{10}}{10} + \frac{3316x^9}{3} + \frac{7869x^8}{8}$$

$$+ \frac{12016x^7}{7} + \frac{2873x^6}{2} + \frac{8292x^5}{5} + \frac{4483x^4}{4} + 870x^3 + 378x^2 + 216x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**3,x)

[Out] 1000*x**13/13 + 25*x**12 + 4830*x**11/11 + 3061*x**10/10 + 3316*x
 9/3 + 7869*x8/8 + 12016*x**7/7 + 2873*x**6/2 + 8292*x**5/5 +
 4483*x**4/4 + 870*x**3 + 378*x**2 + 216*x

GIAC/XCAS [A] time = 0.262009, size = 86, normalized size = 1.05

$$\frac{1000}{13}x^{13} + 25x^{12} + \frac{4830}{11}x^{11} + \frac{3061}{10}x^{10} + \frac{3316}{3}x^9 + \frac{7869}{8}x^8$$

$$+ \frac{12016}{7}x^7 + \frac{2873}{2}x^6 + \frac{8292}{5}x^5 + \frac{4483}{4}x^4 + 870x^3 + 378x^2 + 216x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 1000/13*x^13 + 25*x^12 + 4830/11*x^11 + 3061/10*x^10 + 3316/3*x^9  
+ 7869/8*x^8 + 12016/7*x^7 + 2873/2*x^6 + 8292/5*x^5 + 4483/4*x^4  
+ 870*x^3 + 378*x^2 + 216*x
```

$$3.32 \quad \int (3 - x + 2x^2)^3 (2 + 3x + 5x^2)^2 dx$$

Optimal. Leaf size=68

$$\frac{200x^{11}}{11} - 6x^{10} + \frac{922x^9}{9} + \frac{83x^8}{8} + \frac{1571x^7}{7} + \frac{299x^6}{3} + \frac{1416x^5}{5} + \frac{635x^4}{4} + 237x^3 + 108x^2 + 108x$$

[Out] $108*x + 108*x^2 + 237*x^3 + (635*x^4)/4 + (1416*x^5)/5 + (299*x^6)/3 + (1571*x^7)/7 + (83*x^8)/8 + (922*x^9)/9 - 6*x^{10} + (200*x^{11})/11$

Rubi [A] time = 0.0879937, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{200x^{11}}{11} - 6x^{10} + \frac{922x^9}{9} + \frac{83x^8}{8} + \frac{1571x^7}{7} + \frac{299x^6}{3} + \frac{1416x^5}{5} + \frac{635x^4}{4} + 237x^3 + 108x^2 + 108x$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2, x]$

[Out] $108*x + 108*x^2 + 237*x^3 + (635*x^4)/4 + (1416*x^5)/5 + (299*x^6)/3 + (1571*x^7)/7 + (83*x^8)/8 + (922*x^9)/9 - 6*x^{10} + (200*x^{11})/11$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{3892x^9}{495} - \frac{6387x^8}{440} + \frac{44619x^7}{770} - \frac{89849x^6}{1320} + \frac{61947x^5}{440} - \frac{22329x^4}{220} + \frac{31041x^3}{220} + \frac{28431x}{440} + \frac{(100x + 107)(2x^2 - x + 3)^4(5x^2 + 3x + 2)}{440} - \frac{21627 \int x dx}{220}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{rubi_integrate}((2*x**2-x+3)**3*(5*x**2+3*x+2)**2, x)$

[Out] $3892*x**9/495 - 6387*x**8/440 + 44619*x**7/770 - 89849*x**6/1320 + 61947*x**5/440 - 22329*x**4/220 + 31041*x**3/220 + 28431*x/440 + (100*x + 107)*(2*x**2 - x + 3)**4*(5*x**2 + 3*x + 2)/440 - 21627*Integral(x, x)/220$

Mathematica [A] time = 0.00366861, size = 68, normalized size = 1.

$$\frac{200x^{11}}{11} - 6x^{10} + \frac{922x^9}{9} + \frac{83x^8}{8} + \frac{1571x^7}{7} + \frac{299x^6}{3} + \frac{1416x^5}{5} + \frac{635x^4}{4} + 237x^3 + 108x^2 + 108x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2, x]

[Out] 108*x + 108*x^2 + 237*x^3 + (635*x^4)/4 + (1416*x^5)/5 + (299*x^6)/3 + (1571*x^7)/7 + (83*x^8)/8 + (922*x^9)/9 - 6*x^10 + (200*x^11)/11

Maple [A] time = 0.002, size = 55, normalized size = 0.8

$$108x + 108x^2 + 237x^3 + \frac{635x^4}{4} + \frac{1416x^5}{5} + \frac{299x^6}{3} + \frac{1571x^7}{7} + \frac{83x^8}{8} + \frac{922x^9}{9} - 6x^{10} + \frac{200x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^3*(5*x^2+3*x+2)^2, x)

[Out] 108*x+108*x^2+237*x^3+635/4*x^4+1416/5*x^5+299/3*x^6+1571/7*x^7+83/8*x^8+922/9*x^9-6*x^10+200/11*x^11

Maxima [A] time = 0.688306, size = 73, normalized size = 1.07

$$\frac{200}{11}x^{11} - 6x^{10} + \frac{922}{9}x^9 + \frac{83}{8}x^8 + \frac{1571}{7}x^7 + \frac{299}{3}x^6 + \frac{1416}{5}x^5 + \frac{635}{4}x^4 + 237x^3 + 108x^2 + 108x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3, x, algorithm="maxima")

[Out] 200/11*x^11 - 6*x^10 + 922/9*x^9 + 83/8*x^8 + 1571/7*x^7 + 299/3*x^6 + 1416/5*x^5 + 635/4*x^4 + 237*x^3 + 108*x^2 + 108*x

Fricas [A] time = 0.234438, size = 1, normalized size = 0.01

$$\frac{200}{11}x^{11} - 6x^{10} + \frac{922}{9}x^9 + \frac{83}{8}x^8 + \frac{1571}{7}x^7 + \frac{299}{3}x^6 + \frac{1416}{5}x^5 + \frac{635}{4}x^4 + 237x^3 + 108x^2 + 108x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3,x, algorithm="fricas")`

[Out] $200/11*x^{11} - 6*x^{10} + 922/9*x^9 + 83/8*x^8 + 1571/7*x^7 + 299/3*x^6 + 1416/5*x^5 + 635/4*x^4 + 237*x^3 + 108*x^2 + 108*x$

Sympy [A] time = 0.068309, size = 65, normalized size = 0.96

$$\frac{200x^{11}}{11} - 6x^{10} + \frac{922x^9}{9} + \frac{83x^8}{8} + \frac{1571x^7}{7} + \frac{299x^6}{3} + \frac{1416x^5}{5} + \frac{635x^4}{4} + 237x^3 + 108x^2 + 108x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**2,x)`

[Out] $200*x^{11}/11 - 6*x^{10} + 922*x^9/9 + 83*x^8/8 + 1571*x^7/7 + 299*x^6/3 + 1416*x^5/5 + 635*x^4/4 + 237*x^3 + 108*x^2 + 108*x$

GIAC/XCAS [A] time = 0.261301, size = 73, normalized size = 1.07

$$\frac{200}{11}x^{11} - 6x^{10} + \frac{922}{9}x^9 + \frac{83}{8}x^8 + \frac{1571}{7}x^7 + \frac{299}{3}x^6 + \frac{1416}{5}x^5 + \frac{635}{4}x^4 + 237x^3 + 108x^2 + 108x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3,x, algorithm="giac")`

[Out] $200/11*x^{11} - 6*x^{10} + 922/9*x^9 + 83/8*x^8 + 1571/7*x^7 + 299/3*x^6 + 1416/5*x^5 + 635/4*x^4 + 237*x^3 + 108*x^2 + 108*x$

$$3.33 \quad \int (3 - x + 2x^2)^3 (2 + 3x + 5x^2) dx$$

Optimal. Leaf size=56

$$\frac{40x^9}{9} - \frac{9x^8}{2} + \frac{190x^7}{7} - \frac{83x^6}{6} + \frac{288x^5}{5} - 5x^4 + 60x^3 + \frac{27x^2}{2} + 54x$$

[Out] $54*x + (27*x^2)/2 + 60*x^3 - 5*x^4 + (288*x^5)/5 - (83*x^6)/6 + (190*x^7)/7 - (9*x^8)/2 + (40*x^9)/9$

Rubi [A] time = 0.0601136, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{40x^9}{9} - \frac{9x^8}{2} + \frac{190x^7}{7} - \frac{83x^6}{6} + \frac{288x^5}{5} - 5x^4 + 60x^3 + \frac{27x^2}{2} + 54x$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2), x]$

[Out] $54*x + (27*x^2)/2 + 60*x^3 - 5*x^4 + (288*x^5)/5 - (83*x^6)/6 + (190*x^7)/7 - (9*x^8)/2 + (40*x^9)/9$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{40x^9}{9} - \frac{9x^8}{2} + \frac{190x^7}{7} - \frac{83x^6}{6} + \frac{288x^5}{5} - 5x^4 + 60x^3 + 54x + 27 \int x dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{rubi_integrate}((2*x**2-x+3)**3*(5*x**2+3*x+2), x)$

[Out] $40*x**9/9 - 9*x**8/2 + 190*x**7/7 - 83*x**6/6 + 288*x**5/5 - 5*x**4 + 60*x**3 + 54*x + 27*\text{Integral}(x, x)$

Mathematica [A] time = 0.00201941, size = 56, normalized size = 1.

$$\frac{40x^9}{9} - \frac{9x^8}{2} + \frac{190x^7}{7} - \frac{83x^6}{6} + \frac{288x^5}{5} - 5x^4 + 60x^3 + \frac{27x^2}{2} + 54x$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2), x]

[Out] 54*x + (27*x^2)/2 + 60*x^3 - 5*x^4 + (288*x^5)/5 - (83*x^6)/6 + (190*x^7)/7 - (9*x^8)/2 + (40*x^9)/9

Maple [A] time = 0.002, size = 45, normalized size = 0.8

$$54x + \frac{27x^2}{2} + 60x^3 - 5x^4 + \frac{288x^5}{5} - \frac{83x^6}{6} + \frac{190x^7}{7} - \frac{9x^8}{2} + \frac{40x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^3*(5*x^2+3*x+2), x)

[Out] 54*x+27/2*x^2+60*x^3-5*x^4+288/5*x^5-83/6*x^6+190/7*x^7-9/2*x^8+40/9*x^9

Maxima [A] time = 0.686941, size = 59, normalized size = 1.05

$$\frac{40}{9}x^9 - \frac{9}{2}x^8 + \frac{190}{7}x^7 - \frac{83}{6}x^6 + \frac{288}{5}x^5 - 5x^4 + 60x^3 + \frac{27}{2}x^2 + 54x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3,x, algorithm="maxima")

[Out] 40/9*x^9 - 9/2*x^8 + 190/7*x^7 - 83/6*x^6 + 288/5*x^5 - 5*x^4 + 60*x^3 + 27/2*x^2 + 54*x

Fricas [A] time = 0.232509, size = 1, normalized size = 0.02

$$\frac{40}{9}x^9 - \frac{9}{2}x^8 + \frac{190}{7}x^7 - \frac{83}{6}x^6 + \frac{288}{5}x^5 - 5x^4 + 60x^3 + \frac{27}{2}x^2 + 54x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3,x, algorithm="fricas")

[Out] $40/9*x^9 - 9/2*x^8 + 190/7*x^7 - 83/6*x^6 + 288/5*x^5 - 5*x^4 + 60*x^3 + 27/2*x^2 + 54*x$

Sympy [A] time = 0.061963, size = 53, normalized size = 0.95

$$\frac{40x^9}{9} - \frac{9x^8}{2} + \frac{190x^7}{7} - \frac{83x^6}{6} + \frac{288x^5}{5} - 5x^4 + 60x^3 + \frac{27x^2}{2} + 54x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**3*(5*x**2+3*x+2),x)`

[Out] $40*x**9/9 - 9*x**8/2 + 190*x**7/7 - 83*x**6/6 + 288*x**5/5 - 5*x**4 + 60*x**3 + 27*x**2/2 + 54*x$

GIAC/XCAS [A] time = 0.263895, size = 59, normalized size = 1.05

$$\frac{40}{9}x^9 - \frac{9}{2}x^8 + \frac{190}{7}x^7 - \frac{83}{6}x^6 + \frac{288}{5}x^5 - 5x^4 + 60x^3 + \frac{27}{2}x^2 + 54x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3,x, algorithm="giac")`

[Out] $40/9*x^9 - 9/2*x^8 + 190/7*x^7 - 83/6*x^6 + 288/5*x^5 - 5*x^4 + 60*x^3 + 27/2*x^2 + 54*x$

$$3.34 \quad \int \frac{(3-x+2x^2)^3}{2+3x+5x^2} dx$$

Optimal. Leaf size=70

$$\frac{8x^5}{25} - \frac{21x^4}{25} + \frac{1222x^3}{375} - \frac{7451x^2}{1250} - \frac{158389 \log(5x^2 + 3x + 2)}{31250} + \frac{49508x}{3125} + \frac{328757 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15625\sqrt{31}}$$

[Out] (49508*x)/3125 - (7451*x^2)/1250 + (1222*x^3)/375 - (21*x^4)/25 + (8*x^5)/25 + (328757*ArcTan[(3 + 10*x)/Sqrt[31]])/(15625*Sqrt[31]) - (158389*Log[2 + 3*x + 5*x^2])/31250

Rubi [A] time = 0.102539, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{8x^5}{25} - \frac{21x^4}{25} + \frac{1222x^3}{375} - \frac{7451x^2}{1250} - \frac{158389 \log(5x^2 + 3x + 2)}{31250} + \frac{49508x}{3125} + \frac{328757 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15625\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2), x]

[Out] (49508*x)/3125 - (7451*x^2)/1250 + (1222*x^3)/375 - (21*x^4)/25 + (8*x^5)/25 + (328757*ArcTan[(3 + 10*x)/Sqrt[31]])/(15625*Sqrt[31]) - (158389*Log[2 + 3*x + 5*x^2])/31250

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{637x^3}{375} - \frac{(-40x + 65)(2x^2 - x + 3)^2}{500} - \frac{158389 \log(5x^2 + 3x + 2)}{31250} + \frac{328757\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{484375} - \frac{\int\left(-\frac{179282}{25}\right) dx}{500} - \frac{9477 \int x dx}{1250}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**3/(5*x**2+3*x+2), x)

[Out] 637*x**3/375 - (-40*x + 65)*(2*x**2 - x + 3)**2/500 - 158389*log(5*x**2 + 3*x + 2)/31250 + 328757*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/484375 - Integral(-179282/25, x)/500 - 9477*Integral(x,

$x)/1250$

Mathematica [A] time = 0.040395, size = 63, normalized size = 0.9

$$\frac{31 (5x (6000x^4 - 15750x^3 + 61100x^2 - 111765x + 297048) - 475167 \log(5x^2 + 3x + 2)) + 1972542\sqrt{31} \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{2906250}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2), x]

[Out] (1972542*sqrt[31]*ArcTan[(3 + 10*x)/sqrt[31]] + 31*(5*x*(297048 - 111765*x + 61100*x^2 - 15750*x^3 + 6000*x^4) - 475167*Log[2 + 3*x + 5*x^2]))/2906250

Maple [A] time = 0.005, size = 54, normalized size = 0.8

$$\frac{49508x}{3125} - \frac{7451x^2}{1250} + \frac{1222x^3}{375} - \frac{21x^4}{25} + \frac{8x^5}{25} - \frac{158389 \ln(5x^2 + 3x + 2)}{31250} + \frac{328757\sqrt{31}}{484375} \arctan\left(\frac{(3 + 10x)\sqrt{31}}{31}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^3/(5*x^2+3*x+2), x)

[Out] 49508/3125*x-7451/1250*x^2+1222/375*x^3-21/25*x^4+8/25*x^5-158389/31250*ln(5*x^2+3*x+2)+328757/484375*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/2)

Maxima [A] time = 0.768738, size = 72, normalized size = 1.03

$$\frac{8}{25}x^5 - \frac{21}{25}x^4 + \frac{1222}{375}x^3 - \frac{7451}{1250}x^2 + \frac{328757}{484375}\sqrt{31} \arctan\left(\frac{1}{31}\sqrt{31}(10x + 3)\right) + \frac{49508}{3125}x - \frac{158389}{31250} \log(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2), x, algorithm="maxima")

[Out] $8/25*x^5 - 21/25*x^4 + 1222/375*x^3 - 7451/1250*x^2 + 328757/484375*\sqrt{31}*\arctan(1/31*\sqrt{31}*(10*x + 3)) + 49508/3125*x - 158389/31250*\log(5*x^2 + 3*x + 2)$

Fricas [A] time = 0.262724, size = 86, normalized size = 1.23

$$\frac{1}{2906250} \sqrt{31} \left(5 \sqrt{31} (6000 x^5 - 15750 x^4 + 61100 x^3 - 111765 x^2 + 297048 x) - 475167 \sqrt{31} \log(5 x^2 + 3 x + 2) + 1972542 \arctan\left(\frac{1}{31} \sqrt{31} (10 x + 3)\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2),x, algorithm="fricas")`

[Out] $1/2906250*\sqrt{31}*(5*\sqrt{31}*(6000*x^5 - 15750*x^4 + 61100*x^3 - 111765*x^2 + 297048*x) - 475167*\sqrt{31}*\log(5*x^2 + 3*x + 2) + 1972542*\arctan(1/31*\sqrt{31}*(10*x + 3)))$

Sympy [A] time = 0.158155, size = 76, normalized size = 1.09

$$\frac{8x^5}{25} - \frac{21x^4}{25} + \frac{1222x^3}{375} - \frac{7451x^2}{1250} + \frac{49508x}{3125} - \frac{158389 \log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{31250} + \frac{328757\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{484375}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**3/(5*x**2+3*x+2),x)`

[Out] $8*x**5/25 - 21*x**4/25 + 1222*x**3/375 - 7451*x**2/1250 + 49508*x/3125 - 158389*\log(x**2 + 3*x/5 + 2/5)/31250 + 328757*\sqrt{31}*\operatorname{atan}(10*\sqrt{31}*x/31 + 3*\sqrt{31}/31)/484375$

GIAC/XCAS [A] time = 0.265556, size = 72, normalized size = 1.03

$$\frac{8}{25} x^5 - \frac{21}{25} x^4 + \frac{1222}{375} x^3 - \frac{7451}{1250} x^2 + \frac{328757}{484375} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31} (10 x + 3)\right) + \frac{49508}{3125} x - \frac{158389}{31250} \ln(5 x^2 + 3 x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2),x, algorithm="giac")`

```
[Out] 8/25*x^5 - 21/25*x^4 + 1222/375*x^3 - 7451/1250*x^2 + 328757/4843  
75*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 49508/3125*x - 158  
389/31250*ln(5*x^2 + 3*x + 2)
```

$$3.35 \quad \int \frac{(3-x+2x^2)^3}{(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=77

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1331(247x + 443)}{96875(5x^2 + 3x + 2)} - \frac{10769 \log(5x^2 + 3x + 2)}{6250} + \frac{1466x}{625} + \frac{3819607 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{96875\sqrt{31}}$$

[Out] (1466*x)/625 - (54*x^2)/125 + (8*x^3)/75 + (1331*(443 + 247*x))/(96875*(2 + 3*x + 5*x^2)) + (3819607*ArcTan[(3 + 10*x)/Sqrt[31]])/(96875*Sqrt[31]) - (10769*Log[2 + 3*x + 5*x^2])/6250

Rubi [A] time = 0.125044, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1331(247x + 443)}{96875(5x^2 + 3x + 2)} - \frac{10769 \log(5x^2 + 3x + 2)}{6250} + \frac{1466x}{625} + \frac{3819607 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{96875\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^2, x]

[Out] (1466*x)/625 - (54*x^2)/125 + (8*x^3)/75 + (1331*(443 + 247*x))/(96875*(2 + 3*x + 5*x^2)) + (3819607*ArcTan[(3 + 10*x)/Sqrt[31]])/(96875*Sqrt[31]) - (10769*Log[2 + 3*x + 5*x^2])/6250

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & -\frac{16x^5}{31} + \frac{144x^4}{155} - \frac{6328x^3}{2325} + \frac{(10x+3)(2x^2-x+3)^3}{31(5x^2+3x+2)} - \frac{10769 \log(5x^2+3x+2)}{6250} \\ & + \frac{3819607\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{3003125} - \frac{\int \frac{31217}{625} dx}{31} + \frac{19124 \int x dx}{3875} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**2, x)

[Out] -16*x**5/31 + 144*x**4/155 - 6328*x**3/2325 + (10*x + 3)*(2*x**2 - x + 3)**3/(31*(5*x**2 + 3*x + 2)) - 10769*log(5*x**2 + 3*x + 2)

$/6250 + 3819607 \cdot \sqrt{31} \cdot \operatorname{atan}(\sqrt{31} \cdot (10x/31 + 3/31))/3003125$
 $- \operatorname{Integral}(31217/625, x)/31 + 19124 \cdot \operatorname{Integral}(x, x)/3875$

Mathematica [A] time = 0.0539002, size = 77, normalized size = 1.

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1331(247x + 443)}{96875(5x^2 + 3x + 2)} - \frac{10769 \log(5x^2 + 3x + 2)}{6250} + \frac{1466x}{625} + \frac{3819607 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{96875\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^2, x]

[Out] (1466*x)/625 - (54*x^2)/125 + (8*x^3)/75 + (1331*(443 + 247*x))/(96875*(2 + 3*x + 5*x^2)) + (3819607*ArcTan[(3 + 10*x)/Sqrt[31]])/(96875*Sqrt[31]) - (10769*Log[2 + 3*x + 5*x^2])/6250

Maple [A] time = 0.009, size = 61, normalized size = 0.8

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1466x}{625} - \frac{121}{625} \left(-\frac{2717x}{775} - \frac{4873}{775} \right) \left(x^2 + \frac{3x}{5} + \frac{2}{5} \right)^{-1} - \frac{10769 \ln(25x^2 + 15x + 10)}{6250} + \frac{3819607\sqrt{31}}{3003125} \arctan\left(\frac{(50x + 15)\sqrt{31}}{155}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^3/(5*x^2+3*x+2)^2, x)

[Out] 8/75*x^3-54/125*x^2+1466/625*x-121/625*(-2717/775*x-4873/775)/(x^2+3/5*x+2/5)-10769/6250*ln(25*x^2+15*x+10)+3819607/3003125*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))

Maxima [A] time = 0.771164, size = 84, normalized size = 1.09

$$\frac{8}{75}x^3 - \frac{54}{125}x^2 + \frac{3819607}{3003125}\sqrt{31} \arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{1466}{625}x + \frac{1331(247x+443)}{96875(5x^2+3x+2)} - \frac{10769}{6250} \log(5x^2+3x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")

[Out] $\frac{8}{75}x^3 - \frac{54}{125}x^2 + \frac{3819607}{3003125}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{1466}{625}x + \frac{1331}{96875}(247x+443)/(5x^2+3x+2) - \frac{10769}{6250}\log(5x^2+3x+2)$

Fricas [A] time = 0.265656, size = 131, normalized size = 1.7

$$\frac{\sqrt{31}\left(1001517\sqrt{31}(5x^2+3x+2)\log(5x^2+3x+2) - 22917642(5x^2+3x+2)\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) - 2\sqrt{31}(155000x^3+1331(247x+443))\right)}{18018750(5x^2+3x+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")

[Out] $-\frac{1}{18018750}\sqrt{31}\left(1001517\sqrt{31}(5x^2+3x+2)\log(5x^2+3x+2) - 22917642(5x^2+3x+2)\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) - 2\sqrt{31}(155000x^3+1331(247x+443))\right)/(5x^2+3x+2)$

Sympy [A] time = 0.220291, size = 78, normalized size = 1.01

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1466x}{625} + \frac{328757x + 589633}{484375x^2 + 290625x + 193750} - \frac{10769\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{6250} + \frac{3819607\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{3003125}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)

[Out] $\frac{8}{75}x^3 - \frac{54}{125}x^2 + \frac{1466}{625}x + \frac{328757x + 589633}{484375x^2 + 290625x + 193750} - \frac{10769\log(x^2 + 3x/5 + 2/5)}{6250} + \frac{3819607\sqrt{31}\operatorname{atan}(10\sqrt{31}x/31 + 3\sqrt{31}/31)}{3003125}$

GIAC/XCAS [A] time = 0.264709, size = 84, normalized size = 1.09

$$\frac{8}{75}x^3 - \frac{54}{125}x^2 + \frac{3819607}{3003125}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{1466}{625}x + \frac{1331(247x+443)}{96875(5x^2+3x+2)} - \frac{10769}{6250}\ln(5x^2+3x+2)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")
```

```
[Out] 8/75*x^3 - 54/125*x^2 + 3819607/3003125*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1466/625*x + 1331/96875*(247*x + 443)/(5*x^2 + 3*x + 2) - 10769/6250*ln(5*x^2 + 3*x + 2)
```

$$3.36 \quad \int \frac{(3-x+2x^2)^3}{(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=84

$$\frac{121(342840x + 188381)}{6006250(5x^2 + 3x + 2)} + \frac{1331(247x + 443)}{193750(5x^2 + 3x + 2)^2} - \frac{66}{625} \log(5x^2 + 3x + 2) + \frac{8x}{125} + \frac{11341176 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{600625\sqrt{31}}$$

[Out] (8*x)/125 + (1331*(443 + 247*x))/(193750*(2 + 3*x + 5*x^2)^2) + (121*(188381 + 342840*x))/(6006250*(2 + 3*x + 5*x^2)) + (11341176*ArcTan[(3 + 10*x)/Sqrt[31]])/(600625*Sqrt[31]) - (66*Log[2 + 3*x + 5*x^2])/625

Rubi [A] time = 0.148799, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(342840x + 188381)}{6006250(5x^2 + 3x + 2)} + \frac{1331(247x + 443)}{193750(5x^2 + 3x + 2)^2} - \frac{66}{625} \log(5x^2 + 3x + 2) + \frac{8x}{125} + \frac{11341176 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{600625\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^3, x]

[Out] (8*x)/125 + (1331*(443 + 247*x))/(193750*(2 + 3*x + 5*x^2)^2) + (121*(188381 + 342840*x))/(6006250*(2 + 3*x + 5*x^2)) + (11341176*ArcTan[(3 + 10*x)/Sqrt[31]])/(600625*Sqrt[31]) - (66*Log[2 + 3*x + 5*x^2])/625

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{8x^3}{155} + \frac{(10x+3)(2x^2-x+3)^3}{62(5x^2+3x+2)^2} + \frac{14883(69x+61)}{240250(5x^2+3x+2)} - \frac{66 \log(5x^2+3x+2)}{625} + \frac{11341176\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{18619375} - \frac{\int \frac{2112}{125} dx}{62} + \frac{192 \int x dx}{775}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**3, x)

[Out] $-8x^3/155 + (10x + 3)(2x^2 - x + 3)^3/(62(5x^2 + 3x + 2)^2) + 14883(69x + 61)/(240250(5x^2 + 3x + 2)) - 66\log(5x^2 + 3x + 2)/625 + 11341176\sqrt{31}\operatorname{atan}(\sqrt{31}(10x/31 + 3/31))/18619375 - \operatorname{Integral}(2112/125, x)/62 + 192\operatorname{Integral}(x, x)/775$

Mathematica [A] time = 0.0725325, size = 78, normalized size = 0.93

$$\frac{3751(342840x+188381)}{5x^2+3x+2} + \frac{1279091(247x+443)}{(5x^2+3x+2)^2} - 19662060 \log(5x^2 + 3x + 2) + 11916400x + 113411760\sqrt{31} \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)$$

186193750

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^3, x]

[Out] $(11916400x + (1279091(443 + 247x)))/(2 + 3x + 5x^2)^2 + (3751(188381 + 342840x))/(2 + 3x + 5x^2) + 113411760\sqrt{31}\operatorname{ArcTan}[(3 + 10x)/\sqrt{31}] - 19662060\operatorname{Log}[2 + 3x + 5x^2])/186193750$

Maple [A] time = 0.01, size = 63, normalized size = 0.8

$$\frac{8x}{125} - \frac{11}{5(5x^2 + 3x + 2)^2} \left(-\frac{377124x^3}{24025} - \frac{866987x^2}{48050} - \frac{293711x}{24025} - \frac{232243}{48050} \right) - \frac{66 \ln(125x^2 + 75x + 50)}{625} + \frac{11341176\sqrt{31}}{18619375} \arctan\left(\frac{(250x + 75)\sqrt{31}}{775}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^3/(5*x^2+3*x+2)^3, x)

[Out] $8/125x - 11/5(-377124/24025x^3 - 866987/48050x^2 - 293711/24025x - 232243/48050)/(5x^2 + 3x + 2)^2 - 66/625 \ln(125x^2 + 75x + 50) + 11341176/18619375 \cdot 31^{(1/2)} \arctan(1/775 \cdot (250x + 75) \cdot 31^{(1/2)})$

Maxima [A] time = 0.777997, size = 97, normalized size = 1.15

$$\frac{11341176}{18619375} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{8}{125} x + \frac{121(68568x^3 + 78817x^2 + 53402x + 21113)}{240250(25x^4 + 30x^3 + 29x^2 + 12x + 4)} - \frac{66}{625} \log(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")`

[Out] $11341176/18619375*\sqrt{31}*\arctan(1/31*\sqrt{31}*(10*x + 3)) + 8/125*x + 121/240250*(68568*x^3 + 78817*x^2 + 53402*x + 21113)/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) - 66/625*\log(5*x^2 + 3*x + 2)$

Fricas [A] time = 0.265603, size = 171, normalized size = 2.04

$$\frac{\sqrt{31}\left(126852\sqrt{31}(25x^4 + 30x^3 + 29x^2 + 12x + 4)\log(5x^2 + 3x + 2) - 22682352(25x^4 + 30x^3 + 29x^2 + 12x + 4)\arctan\left(\frac{10\sqrt{31}x + 3}{31}\right) - 5\sqrt{31}(384400x^5 + 461280x^4 + 8742632x^3 + 9721369x^2 + 6523146x + 2554673)\right)}{37238750(25x^4 + 30x^3 + 29x^2 + 12x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")`

[Out] $-1/37238750*\sqrt{31}*(126852*\sqrt{31}*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*\log(5*x^2 + 3*x + 2) - 22682352*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*\arctan(1/31*\sqrt{31}*(10*x + 3)) - 5*\sqrt{31}*(384400*x^5 + 461280*x^4 + 8742632*x^3 + 9721369*x^2 + 6523146*x + 2554673))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)$

Sympy [A] time = 0.282666, size = 85, normalized size = 1.01

$$\frac{8x}{125} + \frac{8296728x^3 + 9536857x^2 + 6461642x + 2554673}{6006250x^4 + 7207500x^3 + 6967250x^2 + 2883000x + 961000} - \frac{66\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{625} + \frac{11341176\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{18619375}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)`

[Out] $8*x/125 + (8296728*x**3 + 9536857*x**2 + 6461642*x + 2554673)/(6006250*x**4 + 7207500*x**3 + 6967250*x**2 + 2883000*x + 961000) - 66*\log(x**2 + 3*x/5 + 2/5)/625 + 11341176*\sqrt{31}*\operatorname{atan}(10*\sqrt{31}*x/31 + 3*\sqrt{31}/31)/18619375$

GIAC/XCAS [A] time = 0.266685, size = 84, normalized size = 1.

$$\frac{11341176}{18619375} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{8}{125} x$$

$$+ \frac{121(68568x^3 + 78817x^2 + 53402x + 21113)}{240250(5x^2 + 3x + 2)^2} - \frac{66}{625} \ln(5x^2 + 3x + 2)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")

[Out] 11341176/18619375*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 8/125*x + 121/240250*(68568*x^3 + 78817*x^2 + 53402*x + 21113)/(5*x^2 + 3*x + 2)^2 - 66/625*ln(5*x^2 + 3*x + 2)

$$3.37 \quad \int \frac{(2+3x+5x^2)^4}{3-x+2x^2} dx$$

Optimal. Leaf size=84

$$\begin{aligned} & \frac{625x^7}{14} + \frac{3625x^6}{24} + \frac{1855x^5}{8} + \frac{6245x^4}{64} - \frac{21229x^3}{96} - \frac{28747x^2}{128} \\ & + \frac{307461}{512} \log(2x^2 - x + 3) + \frac{122691x}{128} + \frac{1156639 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{256\sqrt{23}} \end{aligned}$$

[Out] (122691*x)/128 - (28747*x^2)/128 - (21229*x^3)/96 + (6245*x^4)/64 + (1855*x^5)/8 + (3625*x^6)/24 + (625*x^7)/14 + (1156639*ArcTan[(1 - 4*x)/Sqrt[23]])/(256*Sqrt[23]) + (307461*Log[3 - x + 2*x^2])/512

Rubi [A] time = 0.112129, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\begin{aligned} & \frac{625x^7}{14} + \frac{3625x^6}{24} + \frac{1855x^5}{8} + \frac{6245x^4}{64} - \frac{21229x^3}{96} - \frac{28747x^2}{128} \\ & + \frac{307461}{512} \log(2x^2 - x + 3) + \frac{122691x}{128} + \frac{1156639 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{256\sqrt{23}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2), x]

[Out] (122691*x)/128 - (28747*x^2)/128 - (21229*x^3)/96 + (6245*x^4)/64 + (1855*x^5)/8 + (3625*x^6)/24 + (625*x^7)/14 + (1156639*ArcTan[(1 - 4*x)/Sqrt[23]])/(256*Sqrt[23]) + (307461*Log[3 - x + 2*x^2])/512

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & \frac{20x^5}{7} - \frac{61605x^4}{448} - \frac{254623x^3}{672} + \frac{(60x + 95)(5x^2 + 3x + 2)^3}{168} + \frac{307461 \log(2x^2 - x + 3)}{512} \\ & - \frac{1156639\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{5888} - \frac{\int\left(-\frac{2514111}{16}\right) dx}{168} - \frac{270509 \int x dx}{448} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3),x)`

[Out] $20x^{5/7} - 61605x^4/448 - 254623x^3/672 + (60x + 95)(5x^2 + 3x + 2)^3/168 + 307461 \log(2x^2 - x + 3)/512 - 1156639 \sqrt{23} \operatorname{atan}(\sqrt{23}(4x/23 - 1/23))/5888 - \operatorname{Integral}(-2514111/16, x)/168 - 270509 \operatorname{Integral}(x, x)/448$

Mathematica [A] time = 0.0517153, size = 72, normalized size = 0.86

$$\frac{307461}{512} \log(2x^2 - x + 3) + \frac{x(120000x^6 + 406000x^5 + 623280x^4 + 262290x^3 - 594412x^2 - 603687x + 2576511)}{2688} - \frac{1156639 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{256\sqrt{23}}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2),x]`

[Out] $(x(2576511 - 603687x - 594412x^2 + 262290x^3 + 623280x^4 + 406000x^5 + 120000x^6))/2688 - (1156639 \operatorname{ArcTan}[-1 + 4x]/\sqrt{23} + 307461 \operatorname{Log}[3 - x + 2x^2])/512$

Maple [A] time = 0.007, size = 64, normalized size = 0.8

$$\frac{625x^7}{14} + \frac{3625x^6}{24} + \frac{1855x^5}{8} + \frac{6245x^4}{64} - \frac{21229x^3}{96} - \frac{28747x^2}{128} + \frac{122691x}{128} + \frac{307461 \ln(2x^2 - x + 3)}{512} - \frac{1156639\sqrt{23}}{5888} \arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4/(2*x^2-x+3),x)`

[Out] $625/14x^7 + 3625/24x^6 + 1855/8x^5 + 6245/64x^4 - 21229/96x^3 - 28747/128x^2 + 122691/128x + 307461/512 \ln(2x^2 - x + 3) - 1156639/5888 \sqrt{23} \operatorname{arctan}(1/23(4x-1)\sqrt{23})$

Maxima [A] time = 0.77404, size = 85, normalized size = 1.01

$$\frac{625}{14}x^7 + \frac{3625}{24}x^6 + \frac{1855}{8}x^5 + \frac{6245}{64}x^4 - \frac{21229}{96}x^3 - \frac{28747}{128}x^2 - \frac{1156639}{5888}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{122691}{128}x + \frac{307461}{512}\log(2x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3),x, algorithm="maxima")

[Out] 625/14*x^7 + 3625/24*x^6 + 1855/8*x^5 + 6245/64*x^4 - 21229/96*x^3 - 28747/128*x^2 - 1156639/5888*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 122691/128*x + 307461/512*log(2*x^2 - x + 3)

Fricas [A] time = 0.26226, size = 100, normalized size = 1.19

$$\frac{1}{247296}\sqrt{23}\left(4\sqrt{23}(120000x^7 + 406000x^6 + 623280x^5 + 262290x^4 - 594412x^3 - 603687x^2 + 2576511x) + 6456681\sqrt{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3),x, algorithm="fricas")

[Out] 1/247296*sqrt(23)*(4*sqrt(23)*(120000*x^7 + 406000*x^6 + 623280*x^5 + 262290*x^4 - 594412*x^3 - 603687*x^2 + 2576511*x) + 6456681*sqrt(23)*log(2*x^2 - x + 3) - 48578838*arctan(1/23*sqrt(23)*(4*x - 1)))

Sympy [A] time = 0.169111, size = 87, normalized size = 1.04

$$\frac{625x^7}{14} + \frac{3625x^6}{24} + \frac{1855x^5}{8} + \frac{6245x^4}{64} - \frac{21229x^3}{96} - \frac{28747x^2}{128} + \frac{122691x}{128} + \frac{307461\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{512} - \frac{1156639\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{5888}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**4/(2*x**2-x+3),x)

[Out] 625*x**7/14 + 3625*x**6/24 + 1855*x**5/8 + 6245*x**4/64 - 21229*x**3/96 - 28747*x**2/128 + 122691*x/128 + 307461*log(x**2 - x/2 +

$$\frac{3/2}{512} - \frac{1156639 \sqrt{23} \operatorname{atan}(4 \sqrt{23} x / 23 - \sqrt{23} / 23)}{5888}$$

GIAC/XCAS [A] time = 0.266343, size = 85, normalized size = 1.01

$$\begin{aligned} & \frac{625}{14} x^7 + \frac{3625}{24} x^6 + \frac{1855}{8} x^5 + \frac{6245}{64} x^4 - \frac{21229}{96} x^3 - \frac{28747}{128} x^2 \\ & - \frac{1156639}{5888} \sqrt{23} \operatorname{arctan}\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{122691}{128} x + \frac{307461}{512} \ln(2x^2 - x + 3) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3),x, algorithm="giac")`

[Out] `625/14*x^7 + 3625/24*x^6 + 1855/8*x^5 + 6245/64*x^4 - 21229/96*x^3 - 28747/128*x^2 - 1156639/5888*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 122691/128*x + 307461/512*ln(2*x^2 - x + 3)`

$$3.38 \quad \int \frac{(2+3x+5x^2)^3}{3-x+2x^2} dx$$

Optimal. Leaf size=70

$$\frac{25x^5}{2} + \frac{575x^4}{16} + \frac{965x^3}{24} - \frac{829x^2}{32} + \frac{1331}{128} \log(2x^2 - x + 3) - \frac{4795x}{32} - \frac{59895 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{23}}$$

[Out] $(-4795*x)/32 - (829*x^2)/32 + (965*x^3)/24 + (575*x^4)/16 + (25*x^5)/2 - (59895*ArcTan[(1 - 4*x)/Sqrt[23]])/(64*Sqrt[23]) + (1331*Log[3 - x + 2*x^2])/128$

Rubi [A] time = 0.0968413, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{25x^5}{2} + \frac{575x^4}{16} + \frac{965x^3}{24} - \frac{829x^2}{32} + \frac{1331}{128} \log(2x^2 - x + 3) - \frac{4795x}{32} - \frac{59895 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{23}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2), x]$

[Out] $(-4795*x)/32 - (829*x^2)/32 + (965*x^3)/24 + (575*x^4)/16 + (25*x^5)/2 - (59895*ArcTan[(1 - 4*x)/Sqrt[23]])/(64*Sqrt[23]) + (1331*Log[3 - x + 2*x^2])/128$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{7x^3}{12} + \frac{(40x + 67)(5x^2 + 3x + 2)^2}{80} + \frac{1331 \log(2x^2 - x + 3)}{128} + \frac{59895\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{1472} - \frac{\int \frac{25903}{2} dx}{80} - \frac{8991 \int x dx}{80}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{rubi_integrate}((5*x**2+3*x+2)**3/(2*x**2-x+3), x)$

[Out] $7*x**3/12 + (40*x + 67)*(5*x**2 + 3*x + 2)**2/80 + 1331*log(2*x**2 - x + 3)/128 + 59895*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/14$

72 - Integral(25903/2, x)/80 - 8991*Integral(x, x)/80

Mathematica [A] time = 0.0436943, size = 63, normalized size = 0.9

$$\frac{1}{384} (3993 \log(2x^2 - x + 3) + 4x(1200x^4 + 3450x^3 + 3860x^2 - 2487x - 14385)) + \frac{59895 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{64\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2), x]

[Out] (59895*ArcTan[(-1 + 4*x)/Sqrt[23]])/(64*Sqrt[23]) + (4*x*(-14385 - 2487*x + 3860*x^2 + 3450*x^3 + 1200*x^4) + 3993*Log[3 - x + 2*x^2])/384

Maple [A] time = 0.005, size = 54, normalized size = 0.8

$$\frac{25x^5}{2} + \frac{575x^4}{16} + \frac{965x^3}{24} - \frac{829x^2}{32} - \frac{4795x}{32} + \frac{1331 \ln(2x^2 - x + 3)}{128} + \frac{59895\sqrt{23}}{1472} \arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^3/(2*x^2-x+3), x)

[Out] 25/2*x^5+575/16*x^4+965/24*x^3-829/32*x^2-4795/32*x+1331/128*ln(2*x^2-x+3)+59895/1472*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))

Maxima [A] time = 0.772582, size = 72, normalized size = 1.03

$$\frac{25}{2}x^5 + \frac{575}{16}x^4 + \frac{965}{24}x^3 - \frac{829}{32}x^2 + \frac{59895}{1472}\sqrt{23} \arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \frac{4795}{32}x + \frac{1331}{128} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 25/2*x^5 + 575/16*x^4 + 965/24*x^3 - 829/32*x^2 + 59895/1472*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 4795/32*x + 1331/128*log(2

*x² - x + 3)

Fricas [A] time = 0.260527, size = 86, normalized size = 1.23

$$\frac{1}{8832} \sqrt{23} \left(4 \sqrt{23} (1200 x^5 + 3450 x^4 + 3860 x^3 - 2487 x^2 - 14385 x) + 3993 \sqrt{23} \log(2 x^2 - x + 3) + 359370 \arctan\left(\frac{1}{23} \sqrt{23}\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3), x, algorithm="fricas")

[Out] 1/8832*sqrt(23)*(4*sqrt(23)*(1200*x^5 + 3450*x^4 + 3860*x^3 - 2487*x^2 - 14385*x) + 3993*sqrt(23)*log(2*x^2 - x + 3) + 359370*arctan(1/23*sqrt(23)*(4*x - 1)))

Sympy [A] time = 0.156804, size = 73, normalized size = 1.04

$$\frac{25x^5}{2} + \frac{575x^4}{16} + \frac{965x^3}{24} - \frac{829x^2}{32} - \frac{4795x}{32} + \frac{1331 \log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{128} + \frac{59895\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{1472}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**3/(2*x**2-x+3), x)

[Out] 25*x**5/2 + 575*x**4/16 + 965*x**3/24 - 829*x**2/32 - 4795*x/32 + 1331*log(x**2 - x/2 + 3/2)/128 + 59895*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/1472

GIAC/XCAS [A] time = 0.26472, size = 72, normalized size = 1.03

$$\frac{25}{2} x^5 + \frac{575}{16} x^4 + \frac{965}{24} x^3 - \frac{829}{32} x^2 + \frac{59895}{1472} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{4795}{32} x + \frac{1331}{128} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3), x, algorithm="giac")

[Out] 25/2*x^5 + 575/16*x^4 + 965/24*x^3 - 829/32*x^2 + 59895/1472*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 4795/32*x + 1331/128*ln(2*x^2 - x + 3)

$$3.39 \quad \int \frac{(2+3x+5x^2)^2}{3-x+2x^2} dx$$

Optimal. Leaf size=56

$$\frac{25x^3}{6} + \frac{85x^2}{8} - \frac{363}{32} \log(2x^2 - x + 3) + \frac{51x}{8} + \frac{847 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16\sqrt{23}}$$

[Out] (51*x)/8 + (85*x^2)/8 + (25*x^3)/6 + (847*ArcTan[(1 - 4*x)/Sqrt[23]])/(16*Sqrt[23]) - (363*Log[3 - x + 2*x^2])/32

Rubi [A] time = 0.0878965, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{25x^3}{6} + \frac{85x^2}{8} - \frac{363}{32} \log(2x^2 - x + 3) + \frac{51x}{8} + \frac{847 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2), x]

[Out] (51*x)/8 + (85*x^2)/8 + (25*x^3)/6 + (847*ArcTan[(1 - 4*x)/Sqrt[23]])/(16*Sqrt[23]) - (363*Log[3 - x + 2*x^2])/32

Rubi in Sympy [A] time = 27.1914, size = 58, normalized size = 1.04

$$-\frac{x}{6} + \left(\frac{5x}{6} + \frac{13}{8}\right)(5x^2 + 3x + 2) - \frac{363 \log(2x^2 - x + 3)}{32} - \frac{847\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{368}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3), x)

[Out] -x/6 + (5*x/6 + 13/8)*(5*x**2 + 3*x + 2) - 363*log(2*x**2 - x + 3)/32 - 847*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/368

Mathematica [A] time = 0.0317148, size = 52, normalized size = 0.93

$$\frac{1}{24}x(100x^2 + 255x + 153) - \frac{363}{32}\log(2x^2 - x + 3) - \frac{847 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{16\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2), x]

[Out] (x*(153 + 255*x + 100*x^2))/24 - (847*ArcTan[(-1 + 4*x)/Sqrt[23]])/(16*Sqrt[23]) - (363*Log[3 - x + 2*x^2])/32

Maple [A] time = 0.005, size = 44, normalized size = 0.8

$$\frac{25x^3}{6} + \frac{85x^2}{8} + \frac{51x}{8} - \frac{363 \ln(2x^2 - x + 3)}{32} - \frac{847\sqrt{23}}{368} \arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^2/(2*x^2-x+3), x)

[Out] 25/6*x^3+85/8*x^2+51/8*x-363/32*ln(2*x^2-x+3)-847/368*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))

Maxima [A] time = 0.766298, size = 58, normalized size = 1.04

$$\frac{25}{6}x^3 + \frac{85}{8}x^2 - \frac{847}{368}\sqrt{23} \arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{51}{8}x - \frac{363}{32}\log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 25/6*x^3 + 85/8*x^2 - 847/368*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 51/8*x - 363/32*log(2*x^2 - x + 3)

Fricas [A] time = 0.270894, size = 73, normalized size = 1.3

$$\frac{1}{2208}\sqrt{23}\left(4\sqrt{23}(100x^3 + 255x^2 + 153x) - 1089\sqrt{23}\log(2x^2 - x + 3) - 5082 \arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3),x, algorithm="fricas")`

[Out] `1/2208*sqrt(23)*(4*sqrt(23)*(100*x^3 + 255*x^2 + 153*x) - 1089*sqrt(23)*log(2*x^2 - x + 3) - 5082*arctan(1/23*sqrt(23)*(4*x - 1)))`

Sympy [A] time = 0.153796, size = 60, normalized size = 1.07

$$\frac{25x^3}{6} + \frac{85x^2}{8} + \frac{51x}{8} - \frac{363 \log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{32} - \frac{847\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{368}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)**2/(2*x**2-x+3),x)`

[Out] `25*x**3/6 + 85*x**2/8 + 51*x/8 - 363*log(x**2 - x/2 + 3/2)/32 - 847*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/368`

GIAC/XCAS [A] time = 0.264858, size = 58, normalized size = 1.04

$$\frac{25}{6}x^3 + \frac{85}{8}x^2 - \frac{847}{368}\sqrt{23} \operatorname{arctan}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{51}{8}x - \frac{363}{32}\ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3),x, algorithm="giac")`

[Out] `25/6*x^3 + 85/8*x^2 - 847/368*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 51/8*x - 363/32*ln(2*x^2 - x + 3)`

$$3.40 \quad \int \frac{2+3x+5x^2}{3-x+2x^2} dx$$

Optimal. Leaf size=42

$$\frac{11}{8} \log(2x^2 - x + 3) + \frac{5x}{2} + \frac{33 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{23}}$$

[Out] (5*x)/2 + (33*ArcTan[(1 - 4*x)/Sqrt[23]])/(4*Sqrt[23]) + (11*Log[3 - x + 2*x^2])/8

Rubi [A] time = 0.0672588, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$

$$\frac{11}{8} \log(2x^2 - x + 3) + \frac{5x}{2} + \frac{33 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2), x]

[Out] (5*x)/2 + (33*ArcTan[(1 - 4*x)/Sqrt[23]])/(4*Sqrt[23]) + (11*Log[3 - x + 2*x^2])/8

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{11 \log(2x^2 - x + 3)}{8} - \frac{33\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{92} + \int \frac{5}{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3), x)

[Out] 11*log(2*x**2 - x + 3)/8 - 33*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/92 + Integral(5/2, x)

Mathematica [A] time = 0.0197414, size = 42, normalized size = 1.

$$\frac{11}{8} \log(2x^2 - x + 3) + \frac{5x}{2} - \frac{33 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{4\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2), x]

[Out] (5*x)/2 - (33*ArcTan[(-1 + 4*x)/Sqrt[23]])/(4*Sqrt[23]) + (11*Log[3 - x + 2*x^2])/8

Maple [A] time = 0.004, size = 34, normalized size = 0.8

$$\frac{5x}{2} + \frac{11 \ln(2x^2 - x + 3)}{8} - \frac{33\sqrt{23}}{92} \arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)/(2*x^2-x+3), x)

[Out] 5/2*x+11/8*ln(2*x^2-x+3)-33/92*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))

Maxima [A] time = 0.769842, size = 45, normalized size = 1.07

$$-\frac{33}{92} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{5}{2}x + \frac{11}{8} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3), x, algorithm="maxima")

[Out] -33/92*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 5/2*x + 11/8*log(2*x^2 - x + 3)

Fricas [A] time = 0.268168, size = 55, normalized size = 1.31

$$\frac{1}{184} \sqrt{23} \left(20 \sqrt{23} x + 11 \sqrt{23} \log(2x^2 - x + 3) - 66 \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3), x, algorithm="fricas")

[Out] $1/184*\sqrt{23}*(20*\sqrt{23}*x + 11*\sqrt{23}*\log(2*x^2 - x + 3) - 66*\arctan(1/23*\sqrt{23}*(4*x - 1)))$

Sympy [A] time = 0.135538, size = 46, normalized size = 1.1

$$\frac{5x}{2} + \frac{11 \log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{8} - \frac{33\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{92}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)/(2*x**2-x+3),x)`

[Out] $5*x/2 + 11*\log(x**2 - x/2 + 3/2)/8 - 33*\sqrt{23}*\operatorname{atan}(4*\sqrt{23}*x/23 - \sqrt{23}/23)/92$

GIAC/XCAS [A] time = 0.264574, size = 45, normalized size = 1.07

$$-\frac{33}{92}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{5}{2}x + \frac{11}{8}\ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3),x, algorithm="giac")`

[Out] $-33/92*\sqrt{23}*\arctan(1/23*\sqrt{23}*(4*x - 1)) + 5/2*x + 11/8*\ln(2*x^2 - x + 3)$

$$3.41 \quad \int \frac{1}{(3-x+2x^2)(2+3x+5x^2)} dx$$

Optimal. Leaf size=73

$$-\frac{1}{44} \log(2x^2 - x + 3) + \frac{1}{44} \log(5x^2 + 3x + 2) + \frac{3 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{22\sqrt{23}} + \frac{13 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{22\sqrt{31}}$$

[Out] (3*ArcTan[(1 - 4*x)/Sqrt[23]])/(22*Sqrt[23]) + (13*ArcTan[(3 + 10*x)/Sqrt[31]])/(22*Sqrt[31]) - Log[3 - x + 2*x^2]/44 + Log[2 + 3*x + 5*x^2]/44

Rubi [A] time = 0.115147, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{1}{44} \log(2x^2 - x + 3) + \frac{1}{44} \log(5x^2 + 3x + 2) + \frac{3 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{22\sqrt{23}} + \frac{13 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{22\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)), x]

[Out] (3*ArcTan[(1 - 4*x)/Sqrt[23]])/(22*Sqrt[23]) + (13*ArcTan[(3 + 10*x)/Sqrt[31]])/(22*Sqrt[31]) - Log[3 - x + 2*x^2]/44 + Log[2 + 3*x + 5*x^2]/44

Rubi in Sympy [A] time = 27.3021, size = 71, normalized size = 0.97

$$-\frac{\log(2x^2 - x + 3)}{44} + \frac{\log(5x^2 + 3x + 2)}{44} - \frac{3\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{506} + \frac{13\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{682}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2), x)

[Out] -log(2*x**2 - x + 3)/44 + log(5*x**2 + 3*x + 2)/44 - 3*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/506 + 13*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/682

Mathematica [A] time = 0.065768, size = 73, normalized size = 1.

$$-\frac{1}{44} \log(2x^2 - x + 3) + \frac{1}{44} \log(5x^2 + 3x + 2) - \frac{3 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{22\sqrt{23}} + \frac{13 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{22\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)), x]

[Out] (-3*ArcTan[(-1 + 4*x)/Sqrt[23]])/(22*Sqrt[23]) + (13*ArcTan[(3 + 10*x)/Sqrt[31]])/(22*Sqrt[31]) - Log[3 - x + 2*x^2]/44 + Log[2 + 3*x + 5*x^2]/44

Maple [A] time = 0.005, size = 60, normalized size = 0.8

$$\frac{\ln(5x^2 + 3x + 2)}{44} + \frac{13\sqrt{31}}{682} \arctan\left(\frac{(3 + 10x)\sqrt{31}}{31}\right) - \frac{\ln(2x^2 - x + 3)}{44} - \frac{3\sqrt{23}}{506} \arctan\left(\frac{(4x - 1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(2*x^2-x+3)/(5*x^2+3*x+2), x)

[Out] 1/44*ln(5*x^2+3*x+2)+13/682*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/2)-1/44*ln(2*x^2-x+3)-3/506*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))

Maxima [A] time = 0.772028, size = 80, normalized size = 1.1

$$\frac{13}{682} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{3}{506} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{1}{44} \log(5x^2 + 3x + 2) - \frac{1}{44} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)), x, algorithm="maxima")

[Out] 13/682*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 3/506*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/44*log(5*x^2 + 3*x + 2) - 1/44*log(2*x^2 - x + 3)

Fricas [A] time = 0.270253, size = 105, normalized size = 1.44

$$\frac{1}{31372} \sqrt{31} \sqrt{23} \left(\sqrt{31} \sqrt{23} \log(5x^2 + 3x + 2) - \sqrt{31} \sqrt{23} \log(2x^2 - x + 3) + 26 \sqrt{23} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - 6 \sqrt{31} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)),x, algorithm="fricas")

[Out] 1/31372*sqrt(31)*sqrt(23)*(sqrt(31)*sqrt(23)*log(5*x^2 + 3*x + 2) - sqrt(31)*sqrt(23)*log(2*x^2 - x + 3) + 26*sqrt(23)*arctan(1/31*sqrt(31)*(10*x + 3)) - 6*sqrt(31)*arctan(1/23*sqrt(23)*(4*x - 1)))

Sympy [A] time = 0.319944, size = 83, normalized size = 1.14

$$-\frac{\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{44} + \frac{\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{44} - \frac{3\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{506} + \frac{13\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{682}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2),x)

[Out] -log(x**2 - x/2 + 3/2)/44 + log(x**2 + 3*x/5 + 2/5)/44 - 3*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/506 + 13*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/682

GIAC/XCAS [A] time = 0.265433, size = 80, normalized size = 1.1

$$\frac{13}{682} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{3}{506} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{1}{44} \ln(5x^2 + 3x + 2) - \frac{1}{44} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)),x, algorithm="giac")

[Out] 13/682*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 3/506*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/44*ln(5*x^2 + 3*x + 2) - 1/44*ln(2*x^2 - x + 3)

$$3.42 \quad \int \frac{1}{(3-x+2x^2)(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=94

$$\frac{65x+4}{682(5x^2+3x+2)} + \frac{3}{968} \log(2x^2-x+3) - \frac{3}{968} \log(5x^2+3x+2) + \frac{7 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{484\sqrt{23}} + \frac{2891 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15004\sqrt{31}}$$

[Out] (4 + 65*x)/(682*(2 + 3*x + 5*x^2)) + (7*ArcTan[(1 - 4*x)/Sqrt[23]])/(484*Sqrt[23]) + (2891*ArcTan[(3 + 10*x)/Sqrt[31]])/(15004*Sqrt[31]) + (3*Log[3 - x + 2*x^2])/968 - (3*Log[2 + 3*x + 5*x^2])/968

Rubi [A] time = 0.185965, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{65x+4}{682(5x^2+3x+2)} + \frac{3}{968} \log(2x^2-x+3) - \frac{3}{968} \log(5x^2+3x+2) + \frac{7 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{484\sqrt{23}} + \frac{2891 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15004\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2), x]

[Out] (4 + 65*x)/(682*(2 + 3*x + 5*x^2)) + (7*ArcTan[(1 - 4*x)/Sqrt[23]])/(484*Sqrt[23]) + (2891*ArcTan[(3 + 10*x)/Sqrt[31]])/(15004*Sqrt[31]) + (3*Log[3 - x + 2*x^2])/968 - (3*Log[2 + 3*x + 5*x^2])/968

Rubi in Sympy [A] time = 50.3403, size = 90, normalized size = 0.96

$$\frac{715x+44}{7502(5x^2+3x+2)} + \frac{3 \log(2x^2-x+3)}{968} - \frac{3 \log(5x^2+3x+2)}{968} - \frac{7\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{11132} + \frac{2891\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{465124}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**2, x)

[Out] (715*x + 44)/(7502*(5*x**2 + 3*x + 2)) + 3*log(2*x**2 - x + 3)/968 - 3*log(5*x**2 + 3*x + 2)/968 - 7*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23)) + 2891*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))

$$\frac{3 - 1/23)}{11132} + 2891 \cdot \sqrt{31} \cdot \operatorname{atan}(\sqrt{31} \cdot (10 \cdot x/31 + 3/31)) / 465124$$

Mathematica [A] time = 0.160035, size = 94, normalized size = 1.

$$\frac{65x + 4}{682(5x^2 + 3x + 2)} + \frac{3}{968} \log(2x^2 - x + 3) - \frac{3}{968} \log(5x^2 + 3x + 2) - \frac{7 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{484\sqrt{23}} + \frac{2891 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15004\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2), x]

[Out] (4 + 65*x)/(682*(2 + 3*x + 5*x^2)) - (7*ArcTan[(-1 + 4*x)/Sqrt[23]])/(484*Sqrt[23]) + (2891*ArcTan[(3 + 10*x)/Sqrt[31]])/(15004*Sqrt[31]) + (3*Log[3 - x + 2*x^2])/968 - (3*Log[2 + 3*x + 5*x^2])/968

Maple [A] time = 0.008, size = 77, normalized size = 0.8

$$-\frac{1}{484} \left(-\frac{286x}{31} - \frac{88}{155} \right) \left(x^2 + \frac{3x}{5} + \frac{2}{5} \right)^{-1} - \frac{3 \ln(25x^2 + 15x + 10)}{968} + \frac{2891 \sqrt{31}}{465124} \arctan\left(\frac{(50x + 15)\sqrt{31}}{155}\right) + \frac{3 \ln(2x^2 - x + 3)}{968} - \frac{7\sqrt{23}}{11132} \arctan\left(\frac{(4x - 1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(2*x^2-x+3)/(5*x^2+3*x+2)^2, x)

[Out] -1/484*(-286/31*x-88/155)/(x^2+3/5*x+2/5)-3/968*ln(25*x^2+15*x+10)+2891/465124*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))+3/968*ln(2*x^2-x+3)-7/11132*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))

Maxima [A] time = 0.769735, size = 105, normalized size = 1.12

$$\frac{2891}{465124} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{7}{11132} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{65x + 4}{682(5x^2 + 3x + 2)} - \frac{3}{968} \log(5x^2 + 3x + 2) + \frac{3}{968} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)),x, algorithm="maxima")

[Out] 2891/465124*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 7/11132*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/682*(65*x + 4)/(5*x^2 + 3*x + 2) - 3/968*log(5*x^2 + 3*x + 2) + 3/968*log(2*x^2 - x + 3)

Fricas [A] time = 0.272644, size = 194, normalized size = 2.06

$$\frac{\sqrt{31}\sqrt{23}\left(93\sqrt{31}\sqrt{23}(5x^2 + 3x + 2)\log(5x^2 + 3x + 2) - 93\sqrt{31}\sqrt{23}(5x^2 + 3x + 2)\log(2x^2 - x + 3) - 5782\sqrt{23}(5x^2 + 3x + 2)\right)}{21395704(5x^2 + 3x + 2)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)),x, algorithm="fricas")

[Out] -1/21395704*sqrt(31)*sqrt(23)*(93*sqrt(31)*sqrt(23)*(5*x^2 + 3*x + 2)*log(5*x^2 + 3*x + 2) - 93*sqrt(31)*sqrt(23)*(5*x^2 + 3*x + 2)*log(2*x^2 - x + 3) - 5782*sqrt(23)*(5*x^2 + 3*x + 2)*arctan(1/31*sqrt(31)*(10*x + 3)) + 434*sqrt(31)*(5*x^2 + 3*x + 2)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(65*x + 4))/(5*x^2 + 3*x + 2)

Sympy [A] time = 0.427136, size = 102, normalized size = 1.09

$$\frac{65x + 4}{3410x^2 + 2046x + 1364} + \frac{3\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{968} - \frac{3\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{968} - \frac{7\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{11132} + \frac{2891\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{465124}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**2,x)

[Out] (65*x + 4)/(3410*x**2 + 2046*x + 1364) + 3*log(x**2 - x/2 + 3/2)/968 - 3*log(x**2 + 3*x/5 + 2/5)/968 - 7*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/11132 + 2891*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/465124

GIAC/XCAS [A] time = 0.26642, size = 105, normalized size = 1.12

$$\frac{2891}{465124} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{7}{11132} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{65x + 4}{682(5x^2 + 3x + 2)} - \frac{3}{968} \ln(5x^2 + 3x + 2) + \frac{3}{968} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)),x, algorithm="giac")

[Out] 2891/465124*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 7/11132*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/682*(65*x + 4)/(5*x^2 + 3*x + 2) - 3/968*ln(5*x^2 + 3*x + 2) + 3/968*ln(2*x^2 - x + 3)

$$3.43 \quad \int \frac{1}{(3-x+2x^2)(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=115

$$\begin{aligned} & \frac{65x+4}{1364(5x^2+3x+2)^2} + \frac{21605x+7923}{465124(5x^2+3x+2)} - \frac{\log(2x^2-x+3)}{21296} \\ & + \frac{\log(5x^2+3x+2)}{21296} - \frac{45 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{10648\sqrt{23}} + \frac{847793 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10232728\sqrt{31}} \end{aligned}$$

[Out] (4 + 65*x)/(1364*(2 + 3*x + 5*x^2)^2) + (7923 + 21605*x)/(465124*(2 + 3*x + 5*x^2)) - (45*ArcTan[(1 - 4*x)/Sqrt[23]])/(10648*Sqrt[23]) + (847793*ArcTan[(3 + 10*x)/Sqrt[31]])/(10232728*Sqrt[31]) - Log[3 - x + 2*x^2]/21296 + Log[2 + 3*x + 5*x^2]/21296

Rubi [A] time = 0.270809, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\begin{aligned} & \frac{65x+4}{1364(5x^2+3x+2)^2} + \frac{21605x+7923}{465124(5x^2+3x+2)} - \frac{\log(2x^2-x+3)}{21296} \\ & + \frac{\log(5x^2+3x+2)}{21296} - \frac{45 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{10648\sqrt{23}} + \frac{847793 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10232728\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3), x]

[Out] (4 + 65*x)/(1364*(2 + 3*x + 5*x^2)^2) + (7923 + 21605*x)/(465124*(2 + 3*x + 5*x^2)) - (45*ArcTan[(1 - 4*x)/Sqrt[23]])/(10648*Sqrt[23]) + (847793*ArcTan[(3 + 10*x)/Sqrt[31]])/(10232728*Sqrt[31]) - Log[3 - x + 2*x^2]/21296 + Log[2 + 3*x + 5*x^2]/21296

Rubi in Sympy [A] time = 74.2623, size = 105, normalized size = 0.91

$$\begin{aligned} & \frac{715x+44}{15004(5x^2+3x+2)^2} + \frac{5228410x+1917366}{112560008(5x^2+3x+2)} - \frac{\log(2x^2-x+3)}{21296} + \frac{\log(5x^2+3x+2)}{21296} \\ & + \frac{45\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{244904} + \frac{847793\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{317214568} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**3,x)`

[Out] $(715x + 44)/(15004(5x^2 + 3x + 2)^2) + (5228410x + 1917366)/(112560008(5x^2 + 3x + 2)) - \log(2x^2 - x + 3)/21296 + \log(5x^2 + 3x + 2)/21296 + 45\sqrt{23}\operatorname{atan}(\sqrt{23}(4x/23 - 1/23))/244904 + 847793\sqrt{31}\operatorname{atan}(\sqrt{31}(10x/31 + 3/31))/317214568$

Mathematica [A] time = 0.285927, size = 104, normalized size = 0.9

$$31 \left(-961 \log(2x^2 - x + 3) + 961 \log(5x^2 + 3x + 2) + \frac{44(108025x^3 + 104430x^2 + 89144x + 17210)}{(5x^2 + 3x + 2)^2} \right) + 1695586\sqrt{31} \tan^{-1} \left(\frac{10x+3}{\sqrt{31}} \right) \\ \frac{634429136}{45 \tan^{-1} \left(\frac{4x-1}{\sqrt{23}} \right)} + \frac{10648\sqrt{23}}$$

Antiderivative was successfully verified.

[In] `Integrate[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3),x]`

[Out] $(45 \operatorname{ArcTan}[-1 + 4x]/\sqrt{23})/(10648\sqrt{23}) + (1695586\sqrt{31} \operatorname{ArcTan}[(3 + 10x)/\sqrt{31}] + 31((44(17210 + 89144x + 104430x^2 + 108025x^3))/(2 + 3x + 5x^2)^2 - 961 \operatorname{Log}[3 - x + 2x^2] + 961 \operatorname{Log}[2 + 3x + 5x^2]))/634429136$

Maple [A] time = 0.01, size = 89, normalized size = 0.8

$$\frac{25}{10648(5x^2 + 3x + 2)^2} \left(\frac{95062x^3}{961} + \frac{459492x^2}{4805} + \frac{1961168x}{24025} + \frac{75724}{4805} \right) + \frac{\ln(125x^2 + 75x + 50)}{21296} \\ + \frac{847793\sqrt{31}}{317214568} \arctan \left(\frac{(250x + 75)\sqrt{31}}{775} \right) - \frac{\ln(2x^2 - x + 3)}{21296} + \frac{45\sqrt{23}}{244904} \arctan \left(\frac{(4x - 1)\sqrt{23}}{23} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)/(5*x^2+3*x+2)^3,x)`

[Out] $25/10648(95062/961x^3 + 459492/4805x^2 + 1961168/24025x + 75724/4805)/(5x^2 + 3x + 2)^2 + 1/21296 \ln(125x^2 + 75x + 50) + 847793/317214568 31^{1/2} \arctan(1/775(250x + 75) 31^{1/2}) - 1/21296 \ln(2x^2 - x + 3) + 45/244904 23^{1/2} \arctan(1/23(4x - 1) 23^{1/2})$

Maxima [A] time = 0.77007, size = 132, normalized size = 1.15

$$\frac{847793}{317214568} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{45}{244904} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{108025x^3 + 104430x^2 + 89144x + 17210}{465124(25x^4 + 30x^3 + 29x^2 + 12x + 4)} + \frac{1}{21296} \log(5x^2 + 3x + 2) - \frac{1}{21296} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)),x, algorithm="maxima")

[Out] 847793/317214568*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 45/244904*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/465124*(108025*x^3 + 104430*x^2 + 89144*x + 17210)/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 1/21296*log(5*x^2 + 3*x + 2) - 1/21296*log(2*x^2 - x + 3)

Fricas [A] time = 0.274712, size = 275, normalized size = 2.39

$$\frac{\sqrt{31}\sqrt{23}\left(961\sqrt{31}\sqrt{23}(25x^4 + 30x^3 + 29x^2 + 12x + 4) \log(5x^2 + 3x + 2) - 961\sqrt{31}\sqrt{23}(25x^4 + 30x^3 + 29x^2 + 12x + 4)\right)}{21296(25x^4 + 30x^3 + 29x^2 + 12x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)),x, algorithm="fricas")

[Out] 1/14591870128*sqrt(31)*sqrt(23)*(961*sqrt(31)*sqrt(23)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*log(5*x^2 + 3*x + 2) - 961*sqrt(31)*sqrt(23)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*log(2*x^2 - x + 3) + 1695586*sqrt(23)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(1/31*sqrt(31)*(10*x + 3)) + 86490*sqrt(31)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(1/23*sqrt(23)*(4*x - 1)) + 44*sqrt(31)*sqrt(23)*(108025*x^3 + 104430*x^2 + 89144*x + 17210))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)

Sympy [A] time = 0.507479, size = 119, normalized size = 1.03

$$\frac{108025x^3 + 104430x^2 + 89144x + 17210}{11628100x^4 + 13953720x^3 + 13488596x^2 + 5581488x + 1860496} - \frac{\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{21296} + \frac{\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{21296} + \frac{45\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{244904} + \frac{847793\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{317214568}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**3,x)`

[Out] $(108025x^3 + 104430x^2 + 89144x + 17210)/(11628100x^4 + 13953720x^3 + 13488596x^2 + 5581488x + 1860496) - \log(x^2 - x/2 + 3/2)/21296 + \log(x^2 + 3x/5 + 2/5)/21296 + 45\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)/244904 + 847793\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)/317214568$

GIAC/XCAS [A] time = 0.26658, size = 119, normalized size = 1.03

$$\frac{847793}{317214568} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{45}{244904} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{108025x^3 + 104430x^2 + 89144x + 17210}{465124(5x^2 + 3x + 2)^2} + \frac{1}{21296} \ln(5x^2 + 3x + 2) - \frac{1}{21296} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)),x, algorithm="giac")`

[Out] $847793/317214568\sqrt{31}\operatorname{arctan}(1/31\sqrt{31}(10x + 3)) + 45/244904\sqrt{23}\operatorname{arctan}(1/23\sqrt{23}(4x - 1)) + 1/465124(108025x^3 + 104430x^2 + 89144x + 17210)/(5x^2 + 3x + 2)^2 + 1/21296\ln(5x^2 + 3x + 2) - 1/21296\ln(2x^2 - x + 3)$

$$3.44 \quad \int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^2} dx$$

Optimal. Leaf size=91

$$\begin{aligned} & \frac{125x^5}{4} + \frac{2125x^4}{16} + \frac{9775x^3}{48} - \frac{1185x^2}{8} - \frac{14641(79x+101)}{2944(2x^2-x+3)} \\ & - \frac{30613}{128} \log(2x^2-x+3) - \frac{89359x}{64} - \frac{13292697 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1472\sqrt{23}} \end{aligned}$$

[Out] $(-89359*x)/64 - (1185*x^2)/8 + (9775*x^3)/48 + (2125*x^4)/16 + (125*x^5)/4 - (14641*(101 + 79*x))/(2944*(3 - x + 2*x^2)) - (13292697*ArcTan[(1 - 4*x)/Sqrt[23]])/(1472*Sqrt[23]) - (30613*Log[3 - x + 2*x^2])/128$

Rubi [A] time = 0.14216, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\begin{aligned} & \frac{125x^5}{4} + \frac{2125x^4}{16} + \frac{9775x^3}{48} - \frac{1185x^2}{8} - \frac{14641(79x+101)}{2944(2x^2-x+3)} \\ & - \frac{30613}{128} \log(2x^2-x+3) - \frac{89359x}{64} - \frac{13292697 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1472\sqrt{23}} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^2, x]$

[Out] $(-89359*x)/64 - (1185*x^2)/8 + (9775*x^3)/48 + (2125*x^4)/16 + (125*x^5)/4 - (14641*(101 + 79*x))/(2944*(3 - x + 2*x^2)) - (13292697*ArcTan[(1 - 4*x)/Sqrt[23]])/(1472*Sqrt[23]) - (30613*Log[3 - x + 2*x^2])/128$

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & -\frac{1250x^7}{23} - \frac{6625x^6}{46} - \frac{6025x^5}{46} + \frac{42445x^4}{368} + \frac{185467x^3}{552} - \frac{(-4x+1)(5x^2+3x+2)^4}{23(2x^2-x+3)} \\ & - \frac{30613 \log(2x^2-x+3)}{128} + \frac{13292697\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{33856} - \frac{\int \frac{1164693}{32} dx}{23} - \frac{72755 \int x dx}{368} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**2,x)`

[Out] $-1250x^7/23 - 6625x^6/46 - 6025x^5/46 + 42445x^4/368 + 185467x^3/552 - (-4x + 1)(5x^2 + 3x + 2)^4/(23(2x^2 - x + 3)) - 30613 \log(2x^2 - x + 3)/128 + 13292697 \sqrt{23} \operatorname{atan}(\sqrt{23}(4x/23 - 1/23))/33856 - \operatorname{Integral}(1164693/32, x)/23 - 72755 \operatorname{Integral}(x, x)/368$

Mathematica [A] time = 0.107934, size = 91, normalized size = 1.

$$\frac{125x^5}{4} + \frac{2125x^4}{16} + \frac{9775x^3}{48} - \frac{1185x^2}{8} - \frac{14641(79x + 101)}{2944(2x^2 - x + 3)} - \frac{30613}{128} \log(2x^2 - x + 3) - \frac{89359x}{64} + \frac{13292697 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{1472\sqrt{23}}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^2,x]`

[Out] $(-89359x)/64 - (1185x^2)/8 + (9775x^3)/48 + (2125x^4)/16 + (125x^5)/4 - (14641(101 + 79x))/(2944(3 - x + 2x^2)) + (13292697 \operatorname{ArcTan}((-1 + 4x)/\sqrt{23}))/ (1472 \sqrt{23}) - (30613 \operatorname{Log}[3 - x + 2x^2])/128$

Maple [A] time = 0.011, size = 71, normalized size = 0.8

$$\frac{125x^5}{4} + \frac{2125x^4}{16} + \frac{9775x^3}{48} - \frac{1185x^2}{8} - \frac{89359x}{64} - \frac{1331}{64} \left(\frac{869x}{92} + \frac{1111}{92} \right) \left(x^2 - \frac{x}{2} + \frac{3}{2} \right)^{-1} - \frac{30613 \ln(4x^2 - 2x + 6)}{128} + \frac{13292697 \sqrt{23}}{33856} \arctan\left(\frac{(8x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4/(2*x^2-x+3)^2,x)`

[Out] $125/4x^5 + 2125/16x^4 + 9775/48x^3 - 1185/8x^2 - 89359/64x - 1331/64 \left(\frac{869x + 1111}{92} \right) / (x^2 - 1/2x + 3/2) - 30613/128 \ln(4x^2 - 2x + 6) + 13292697/33856 \cdot 23^{1/2} \arctan(1/46 \cdot (8x - 2) \cdot 23^{1/2})$

Maxima [A] time = 0.778631, size = 97, normalized size = 1.07

$$\frac{125}{4}x^5 + \frac{2125}{16}x^4 + \frac{9775}{48}x^3 - \frac{1185}{8}x^2 + \frac{13292697}{33856}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \frac{89359}{64}x - \frac{14641(79x+101)}{2944(2x^2-x+3)} - \frac{30613}{128}\log(2x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^2,x, algorithm="maxima")

[Out] 125/4*x^5 + 2125/16*x^4 + 9775/48*x^3 - 1185/8*x^2 + 13292697/33856*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 89359/64*x - 14641/2944*(79*x + 101)/(2*x^2 - x + 3) - 30613/128*log(2*x^2 - x + 3)

Fricas [A] time = 0.26568, size = 144, normalized size = 1.58

$$\frac{\sqrt{23}\left(2112297\sqrt{23}(2x^2-x+3)\log(2x^2-x+3) - 79756182(2x^2-x+3)\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \sqrt{23}(552000x^7 - 203136(2x^2-x+3))\right)}{203136(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^2,x, algorithm="fricas")

[Out] -1/203136*sqrt(23)*(2112297*sqrt(23)*(2*x^2 - x + 3)*log(2*x^2 - x + 3) - 79756182*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x - 1)) - sqrt(23)*(552000*x^7 + 2070000*x^6 + 3252200*x^5 - 896080*x^4 - 17959044*x^3 + 8406822*x^2 - 40464543*x - 4436223))/(2*x^2 - x + 3)

Sympy [A] time = 0.227643, size = 88, normalized size = 0.97

$$\frac{125x^5}{4} + \frac{2125x^4}{16} + \frac{9775x^3}{48} - \frac{1185x^2}{8} - \frac{89359x}{64} - \frac{1156639x + 1478741}{5888x^2 - 2944x + 8832} - \frac{30613\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{128} + \frac{13292697\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{33856}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**2,x)

[Out] $125*x^{5/4} + 2125*x^{4/16} + 9775*x^{3/48} - 1185*x^{2/8} - 89359*x/64 - (1156639*x + 1478741)/(5888*x^2 - 2944*x + 8832) - 30613*\log(x^2 - x/2 + 3/2)/128 + 13292697*\sqrt{23}*\operatorname{atan}(4*\sqrt{23}*x/23 - \sqrt{23}/23)/33856$

GIAC/XCAS [A] time = 0.264532, size = 97, normalized size = 1.07

$$\frac{125}{4}x^5 + \frac{2125}{16}x^4 + \frac{9775}{48}x^3 - \frac{1185}{8}x^2 + \frac{13292697}{33856}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \frac{89359}{64}x - \frac{14641(79x+101)}{2944(2x^2-x+3)} - \frac{30613}{128}\ln(2x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^2,x, algorithm="giac")`

[Out] $125/4*x^5 + 2125/16*x^4 + 9775/48*x^3 - 1185/8*x^2 + 13292697/33856*\sqrt{23}*\arctan(1/23*\sqrt{23}*(4*x - 1)) - 89359/64*x - 14641/2944*(79*x + 101)/(2*x^2 - x + 3) - 30613/128*\ln(2*x^2 - x + 3)$

$$3.45 \quad \int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^2} dx$$

Optimal. Leaf size=77

$$\frac{125x^3}{12} + \frac{175x^2}{4} - \frac{1331(17-45x)}{736(2x^2-x+3)} - \frac{2057}{32} \log(2x^2-x+3) + \frac{915x}{16} + \frac{223971 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{368\sqrt{23}}$$

[Out] (915*x)/16 + (175*x^2)/4 + (125*x^3)/12 - (1331*(17 - 45*x))/(736*(3 - x + 2*x^2)) + (223971*ArcTan[(1 - 4*x)/Sqrt[23]])/(368*Sqrt[23]) - (2057*Log[3 - x + 2*x^2])/32

Rubi [A] time = 0.125291, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{125x^3}{12} + \frac{175x^2}{4} - \frac{1331(17-45x)}{736(2x^2-x+3)} - \frac{2057}{32} \log(2x^2-x+3) + \frac{915x}{16} + \frac{223971 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{368\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^2, x]

[Out] (915*x)/16 + (175*x^2)/4 + (125*x^3)/12 - (1331*(17 - 45*x))/(736*(3 - x + 2*x^2)) + (223971*ArcTan[(1 - 4*x)/Sqrt[23]])/(368*Sqrt[23]) - (2057*Log[3 - x + 2*x^2])/32

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & -\frac{250x^5}{23} - \frac{1025x^4}{46} - \frac{595x^3}{138} - \frac{(-4x+1)(5x^2+3x+2)^3}{23(2x^2-x+3)} - \frac{2057 \log(2x^2-x+3)}{32} \\ & - \frac{223971\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{8464} - \frac{\int\left(-\frac{14903}{8}\right) dx}{23} + \frac{10673 \int x dx}{92} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**2, x)

[Out] -250*x**5/23 - 1025*x**4/46 - 595*x**3/138 - (-4*x + 1)*(5*x**2 + 3*x + 2)**3/(23*(2*x**2 - x + 3)) - 2057*log(2*x**2 - x + 3)/32

- 223971*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/8464 - Integral(-14903/8, x)/23 + 10673*Integral(x, x)/92

Mathematica [A] time = 0.0523671, size = 77, normalized size = 1.

$$\frac{125x^3}{12} + \frac{175x^2}{4} + \frac{1331(45x - 17)}{736(2x^2 - x + 3)} - \frac{2057}{32} \log(2x^2 - x + 3) + \frac{915x}{16} - \frac{223971 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{368\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^2, x]

[Out] (915*x)/16 + (175*x^2)/4 + (125*x^3)/12 + (1331*(-17 + 45*x))/(736*(3 - x + 2*x^2)) - (223971*ArcTan[(-1 + 4*x)/Sqrt[23]])/(368*Sqrt[23]) - (2057*Log[3 - x + 2*x^2])/32

Maple [A] time = 0.009, size = 61, normalized size = 0.8

$$\frac{125x^3}{12} + \frac{175x^2}{4} + \frac{915x}{16} - \frac{121}{16} \left(-\frac{495x}{92} + \frac{187}{92} \right) \left(x^2 - \frac{x}{2} + \frac{3}{2} \right)^{-1} - \frac{2057 \ln(4x^2 - 2x + 6)}{32} - \frac{223971\sqrt{23}}{8464} \arctan\left(\frac{(8x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^3/(2*x^2-x+3)^2, x)

[Out] 125/12*x^3+175/4*x^2+915/16*x-121/16*(-495/92*x+187/92)/(x^2-1/2*x+3/2)-2057/32*ln(4*x^2-2*x+6)-223971/8464*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))

Maxima [A] time = 0.771388, size = 84, normalized size = 1.09

$$\frac{125}{12}x^3 + \frac{175}{4}x^2 - \frac{223971}{8464}\sqrt{23} \arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{915}{16}x + \frac{1331(45x-17)}{736(2x^2-x+3)} - \frac{2057}{32} \log(2x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^2,x, algorithm="maxima")

[Out] $125/12*x^3 + 175/4*x^2 - 223971/8464*\sqrt{23}*\arctan(1/23*\sqrt{23}*(4*x - 1)) + 915/16*x + 1331/736*(45*x - 17)/(2*x^2 - x + 3) - 2057/32*\log(2*x^2 - x + 3)$

Fricas [A] time = 0.264602, size = 131, normalized size = 1.7

$$\frac{\sqrt{23}\left(141933\sqrt{23}(2x^2 - x + 3)\log(2x^2 - x + 3) + 1343826(2x^2 - x + 3)\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) - \sqrt{23}(46000x^5 + 170200x^4 + 224940x^3 + 163530x^2 + 558495x - 67881)\right)}{50784(2x^2 - x + 3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^2,x, algorithm="fricas")

[Out] $-1/50784*\sqrt{23}*(141933*\sqrt{23}*(2*x^2 - x + 3)*\log(2*x^2 - x + 3) + 1343826*(2*x^2 - x + 3)*\arctan(1/23*\sqrt{23}*(4*x - 1)) - \sqrt{23}*(46000*x^5 + 170200*x^4 + 224940*x^3 + 163530*x^2 + 558495*x - 67881))/(2*x^2 - x + 3)$

Sympy [A] time = 0.220337, size = 75, normalized size = 0.97

$$\frac{125x^3}{12} + \frac{175x^2}{4} + \frac{915x}{16} + \frac{59895x - 22627}{1472x^2 - 736x + 2208} - \frac{2057\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{32} - \frac{223971\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{8464}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**2,x)

[Out] $125*x**3/12 + 175*x**2/4 + 915*x/16 + (59895*x - 22627)/(1472*x**2 - 736*x + 2208) - 2057*\log(x**2 - x/2 + 3/2)/32 - 223971*\sqrt{23}*\operatorname{atan}(4*\sqrt{23}*x/23 - \sqrt{23}/23)/8464$

GIAC/XCAS [A] time = 0.266306, size = 84, normalized size = 1.09

$$\frac{125}{12}x^3 + \frac{175}{4}x^2 - \frac{223971}{8464}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) + \frac{915}{16}x + \frac{1331(45x - 17)}{736(2x^2 - x + 3)} - \frac{2057}{32}\ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 125/12*x^3 + 175/4*x^2 - 223971/8464*sqrt(23)*arctan(1/23*sqrt(23)
)*(4*x - 1)) + 915/16*x + 1331/736*(45*x - 17)/(2*x^2 - x + 3) -
2057/32*ln(2*x^2 - x + 3)
```

$$3.46 \quad \int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^2} dx$$

Optimal. Leaf size=63

$$\frac{121(19-7x)}{184(2x^2-x+3)} + \frac{55}{8} \log(2x^2-x+3) + \frac{25x}{4} + \frac{1859 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{92\sqrt{23}}$$

[Out] (25*x)/4 + (121*(19 - 7*x))/(184*(3 - x + 2*x^2)) + (1859*ArcTan[(1 - 4*x)/Sqrt[23]])/(92*Sqrt[23]) + (55*Log[3 - x + 2*x^2])/8

Rubi [A] time = 0.110354, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(19-7x)}{184(2x^2-x+3)} + \frac{55}{8} \log(2x^2-x+3) + \frac{25x}{4} + \frac{1859 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{92\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^2, x]

[Out] (25*x)/4 + (121*(19 - 7*x))/(184*(3 - x + 2*x^2)) + (1859*ArcTan[(1 - 4*x)/Sqrt[23]])/(92*Sqrt[23]) + (55*Log[3 - x + 2*x^2])/8

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{50x^3}{23} - \frac{(-4x+1)(5x^2+3x+2)^2}{23(2x^2-x+3)} + \frac{55 \log(2x^2-x+3)}{8} - \frac{1859\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{2116} - \frac{\int(-\frac{279}{2}) dx}{23} - \frac{145 \int x dx}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**2, x)

[Out] -50*x**3/23 - (-4*x + 1)*(5*x**2 + 3*x + 2)**2/(23*(2*x**2 - x + 3)) + 55*log(2*x**2 - x + 3)/8 - 1859*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/2116 - Integral(-279/2, x)/23 - 145*Integral(x, x)/23

Mathematica [A] time = 0.0592621, size = 63, normalized size = 1.

$$-\frac{121(7x-19)}{184(2x^2-x+3)} + \frac{55}{8} \log(2x^2-x+3) + \frac{25x}{4} - \frac{1859 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{92\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^2, x]

[Out] (25*x)/4 - (121*(-19 + 7*x))/(184*(3 - x + 2*x^2)) - (1859*ArcTan[(-1 + 4*x)/Sqrt[23]])/(92*Sqrt[23]) + (55*Log[3 - x + 2*x^2])/8

Maple [A] time = 0.009, size = 51, normalized size = 0.8

$$\frac{25x}{4} + \frac{11}{4} \left(-\frac{77x}{92} + \frac{209}{92} \right) \left(x^2 - \frac{x}{2} + \frac{3}{2} \right)^{-1} + \frac{55 \ln(4x^2 - 2x + 6)}{8} - \frac{1859\sqrt{23}}{2116} \arctan\left(\frac{(8x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^2/(2*x^2-x+3)^2, x)

[Out] 25/4*x+11/4*(-77/92*x+209/92)/(x^2-1/2*x+3/2)+55/8*ln(4*x^2-2*x+6)-1859/2116*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))

Maxima [A] time = 0.769517, size = 70, normalized size = 1.11

$$-\frac{1859}{2116} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{25}{4} x - \frac{121(7x-19)}{184(2x^2-x+3)} + \frac{55}{8} \log(2x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^2, x, algorithm="maxima")

[Out] -1859/2116*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 25/4*x - 12/184*(7*x - 19)/(2*x^2 - x + 3) + 55/8*log(2*x^2 - x + 3)

Fricas [A] time = 0.260563, size = 116, normalized size = 1.84

$$\frac{\sqrt{23} \left(1265 \sqrt{23} (2x^2 - x + 3) \log(2x^2 - x + 3) - 3718 (2x^2 - x + 3) \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \sqrt{23} (2300x^3 - 1150x^2 + 2603x + 2299) \right)}{4232(2x^2 - x + 3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^2, x, algorithm="fricas")

[Out] 1/4232*sqrt(23)*(1265*sqrt(23)*(2*x^2 - x + 3)*log(2*x^2 - x + 3) - 3718*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x - 1)) + sqrt(23)*(2300*x^3 - 1150*x^2 + 2603*x + 2299))/(2*x^2 - x + 3)

Sympy [A] time = 0.208861, size = 61, normalized size = 0.97

$$\frac{25x}{4} - \frac{847x - 2299}{368x^2 - 184x + 552} + \frac{55 \log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{8} - \frac{1859\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{2116}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**2, x)

[Out] 25*x/4 - (847*x - 2299)/(368*x**2 - 184*x + 552) + 55*log(x**2 - x/2 + 3/2)/8 - 1859*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/2116

GIAC/XCAS [A] time = 0.265023, size = 70, normalized size = 1.11

$$-\frac{1859}{2116} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{25}{4} x - \frac{121(7x - 19)}{184(2x^2 - x + 3)} + \frac{55}{8} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^2, x, algorithm="giac")

[Out] -1859/2116*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 25/4*x - 121/184*(7*x - 19)/(2*x^2 - x + 3) + 55/8*ln(2*x^2 - x + 3)

$$3.47 \quad \int \frac{2+3x+5x^2}{(3-x+2x^2)^2} dx$$

Optimal. Leaf size=43

$$-\frac{11(3x+5)}{46(2x^2-x+3)} - \frac{82 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{23\sqrt{23}}$$

[Out] (-11*(5 + 3*x))/(46*(3 - x + 2*x^2)) - (82*ArcTan[(1 - 4*x)/Sqrt[23]])/(23*Sqrt[23])

Rubi [A] time = 0.0488336, antiderivative size = 43, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$

$$-\frac{11(3x+5)}{46(2x^2-x+3)} - \frac{82 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{23\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^2, x]

[Out] (-11*(5 + 3*x))/(46*(3 - x + 2*x^2)) - (82*ArcTan[(1 - 4*x)/Sqrt[23]])/(23*Sqrt[23])

Rubi in Sympy [A] time = 9.56137, size = 37, normalized size = 0.86

$$-\frac{33x+55}{46(2x^2-x+3)} + \frac{82\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{529}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**2, x)

[Out] -(33*x + 55)/(46*(2*x**2 - x + 3)) + 82*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/529

Mathematica [A] time = 0.0302141, size = 43, normalized size = 1.

$$\frac{82 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{23\sqrt{23}} - \frac{11(3x+5)}{46(2x^2-x+3)}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^2, x]

[Out] (-11*(5 + 3*x))/(46*(3 - x + 2*x^2)) + (82*ArcTan[(-1 + 4*x)/Sqrt[23]])/(23*Sqrt[23])

Maple [A] time = 0.007, size = 34, normalized size = 0.8

$$1 \left(-\frac{33x}{92} - \frac{55}{92} \right) \left(x^2 - \frac{x}{2} + \frac{3}{2} \right)^{-1} + \frac{82\sqrt{23}}{529} \arctan\left(\frac{(8x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)/(2*x^2-x+3)^2, x)

[Out] (-33/92*x-55/92)/(x^2-1/2*x+3/2)+82/529*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))

Maxima [A] time = 0.765322, size = 49, normalized size = 1.14

$$\frac{82}{529} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) - \frac{11(3x+5)}{46(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^2, x, algorithm="maxima")

[Out] 82/529*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/46*(3*x + 5)/(2*x^2 - x + 3)

Fricas [A] time = 0.258337, size = 69, normalized size = 1.6

$$\frac{\sqrt{23}\left(164(2x^2-x+3)\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - 11\sqrt{23}(3x+5)\right)}{1058(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^2,x, algorithm="fricas")`

[Out] $1/1058*\sqrt{23}*(164*(2*x^2 - x + 3)*\arctan(1/23*\sqrt{23}*(4*x - 1)) - 11*\sqrt{23}*(3*x + 5))/(2*x^2 - x + 3)$

Sympy [A] time = 0.170158, size = 41, normalized size = 0.95

$$-\frac{33x + 55}{92x^2 - 46x + 138} + \frac{82\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{529}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)/(2*x**2-x+3)**2,x)`

[Out] $-(33*x + 55)/(92*x**2 - 46*x + 138) + 82*\sqrt{23}*\operatorname{atan}(4*\sqrt{23}*x/23 - \sqrt{23}/23)/529$

GIAC/XCAS [A] time = 0.26524, size = 49, normalized size = 1.14

$$\frac{82}{529} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{11(3x + 5)}{46(2x^2 - x + 3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^2,x, algorithm="giac")`

[Out] $82/529*\sqrt{23}*\arctan(1/23*\sqrt{23}*(4*x - 1)) - 11/46*(3*x + 5)/(2*x^2 - x + 3)$

$$3.48 \quad \int \frac{1}{(3-x+2x^2)^2(2+3x+5x^2)} dx$$

Optimal. Leaf size=94

$$\frac{13-6x}{506(2x^2-x+3)} - \frac{13}{968} \log(2x^2-x+3) + \frac{13}{968} \log(5x^2+3x+2) + \frac{241 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{11132\sqrt{23}} + \frac{69 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{484\sqrt{31}}$$

[Out] (13 - 6*x)/(506*(3 - x + 2*x^2)) + (241*ArcTan[(1 - 4*x)/Sqrt[23]])/(11132*Sqrt[23]) + (69*ArcTan[(3 + 10*x)/Sqrt[31]])/(484*Sqrt[31]) - (13*Log[3 - x + 2*x^2])/968 + (13*Log[2 + 3*x + 5*x^2])/968

Rubi [A] time = 0.193253, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{13-6x}{506(2x^2-x+3)} - \frac{13}{968} \log(2x^2-x+3) + \frac{13}{968} \log(5x^2+3x+2) + \frac{241 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{11132\sqrt{23}} + \frac{69 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{484\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)), x]

[Out] (13 - 6*x)/(506*(3 - x + 2*x^2)) + (241*ArcTan[(1 - 4*x)/Sqrt[23]])/(11132*Sqrt[23]) + (69*ArcTan[(3 + 10*x)/Sqrt[31]])/(484*Sqrt[31]) - (13*Log[3 - x + 2*x^2])/968 + (13*Log[2 + 3*x + 5*x^2])/968

Rubi in Sympy [A] time = 50.4487, size = 90, normalized size = 0.96

$$\frac{-66x + 143}{5566(2x^2 - x + 3)} - \frac{13 \log(2x^2 - x + 3)}{968} + \frac{13 \log(5x^2 + 3x + 2)}{968} - \frac{241\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{256036} + \frac{69\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{15004}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2), x)

[Out] (-66*x + 143)/(5566*(2*x**2 - x + 3)) - 13*log(2*x**2 - x + 3)/968 + 13*log(5*x**2 + 3*x + 2)/968 - 241*sqrt(23)*atan(sqrt(23)*(4*x - 1)/23)/256036 + 69*sqrt(31)*atan(sqrt(31)*(10*x + 3)/31)/15004

$$\frac{x/23 - 1/23}{256036} + 69 \cdot \sqrt{31} \cdot \operatorname{atan}(\sqrt{31}) \cdot (10x/31 + 3/31) / 15004$$

Mathematica [A] time = 0.110443, size = 94, normalized size = 1.

$$\frac{13 - 6x}{506(2x^2 - x + 3)} - \frac{13}{968} \log(2x^2 - x + 3) + \frac{13}{968} \log(5x^2 + 3x + 2) - \frac{241 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{11132\sqrt{23}} + \frac{69 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{484\sqrt{31}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)), x]

[Out] (13 - 6*x)/(506*(3 - x + 2*x^2)) - (241*ArcTan[(-1 + 4*x)/Sqrt[23]])/(11132*Sqrt[23]) + (69*ArcTan[(3 + 10*x)/Sqrt[31]])/(484*Sqrt[31]) - (13*Log[3 - x + 2*x^2])/968 + (13*Log[2 + 3*x + 5*x^2])/968

Maple [A] time = 0.008, size = 77, normalized size = 0.8

$$\frac{13 \ln(5x^2 + 3x + 2)}{968} + \frac{69\sqrt{31}}{15004} \arctan\left(\frac{(3 + 10x)\sqrt{31}}{31}\right) - \frac{1}{484} \left(\frac{66x}{23} - \frac{143}{23}\right) \left(x^2 - \frac{x}{2} + \frac{3}{2}\right)^{-1} - \frac{13 \ln(4x^2 - 2x + 6)}{968} - \frac{241\sqrt{23}}{256036} \arctan\left(\frac{(8x - 2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(2*x^2-x+3)^2/(5*x^2+3*x+2), x)

[Out] 13/968*ln(5*x^2+3*x+2)+69/15004*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/2)-1/484*(66/23*x-143/23)/(x^2-1/2*x+3/2)-13/968*ln(4*x^2-2*x+6)-241/256036*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))

Maxima [A] time = 0.773167, size = 105, normalized size = 1.12

$$\frac{69}{15004} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{241}{256036} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{6x - 13}{506(2x^2 - x + 3)} + \frac{13}{968} \log(5x^2 + 3x + 2) - \frac{13}{968} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2),x, algorithm="maxima")

[Out] 69/15004*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 241/256036*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/506*(6*x - 13)/(2*x^2 - x + 3) + 13/968*log(5*x^2 + 3*x + 2) - 13/968*log(2*x^2 - x + 3)

Fricas [A] time = 0.277864, size = 194, normalized size = 2.06

$$\frac{\sqrt{31}\sqrt{23}\left(299\sqrt{31}\sqrt{23}(2x^2 - x + 3)\log(5x^2 + 3x + 2) - 299\sqrt{31}\sqrt{23}(2x^2 - x + 3)\log(2x^2 - x + 3) + 3174\sqrt{23}(2x^2 - x + 3)\log(5x^2 + 3x + 2) - 299\sqrt{31}\sqrt{23}(2x^2 - x + 3)\log(2x^2 - x + 3) + 3174\sqrt{23}(2x^2 - x + 3)\arctan\left(\frac{10\sqrt{31}x + 3\sqrt{31}}{31}\right) - 482\sqrt{31}\sqrt{23}(2x^2 - x + 3)\arctan\left(\frac{4\sqrt{23}x - \sqrt{23}}{23}\right) - 44\sqrt{31}\sqrt{23}(6x - 13)\right)}{15874232(2x^2 - x + 3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2),x, algorithm="fricas")

[Out] 1/15874232*sqrt(31)*sqrt(23)*(299*sqrt(31)*sqrt(23)*(2*x^2 - x + 3)*log(5*x^2 + 3*x + 2) - 299*sqrt(31)*sqrt(23)*(2*x^2 - x + 3)*log(2*x^2 - x + 3) + 3174*sqrt(23)*(2*x^2 - x + 3)*arctan(1/31*sqrt(31)*(10*x + 3)) - 482*sqrt(31)*sqrt(23)*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(6*x - 13)/(2*x^2 - x + 3))

Sympy [A] time = 0.413215, size = 102, normalized size = 1.09

$$\begin{aligned} & -\frac{6x - 13}{1012x^2 - 506x + 1518} - \frac{13\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{968} + \frac{13\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{968} \\ & - \frac{241\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x - \sqrt{23}}{23}\right)}{256036} + \frac{69\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x + 3\sqrt{31}}{31}\right)}{15004} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2),x)

[Out] -(6*x - 13)/(1012*x**2 - 506*x + 1518) - 13*log(x**2 - x/2 + 3/2)/968 + 13*log(x**2 + 3*x/5 + 2/5)/968 - 241*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/256036 + 69*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/15004

GIAC/XCAS [A] time = 0.264435, size = 105, normalized size = 1.12

$$\frac{69}{15004} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{241}{256036} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{6x - 13}{506(2x^2 - x + 3)} + \frac{13}{968} \ln(5x^2 + 3x + 2) - \frac{13}{968} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2),x, algorithm="giac")

[Out] 69/15004*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 241/256036*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/506*(6*x - 13)/(2*x^2 - x + 3) + 13/968*ln(5*x^2 + 3*x + 2) - 13/968*ln(2*x^2 - x + 3)

$$3.49 \quad \int \frac{1}{(3-x+2x^2)^2(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=127

$$\begin{aligned} & -\frac{25(117-137x)}{172546(5x^2+3x+2)} + \frac{13-6x}{506(2x^2-x+3)(5x^2+3x+2)} + \frac{19\log(2x^2-x+3)}{10648} \\ & -\frac{19\log(5x^2+3x+2)}{10648} + \frac{2769\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{122452\sqrt{23}} + \frac{12643\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{165044\sqrt{31}} \end{aligned}$$

[Out] $(-25*(117-137*x))/(172546*(2+3*x+5*x^2)) + (13-6*x)/(506*(3-x+2*x^2)*(2+3*x+5*x^2)) + (2769*ArcTan[(1-4*x)/Sqrt[23]])/(122452*Sqrt[23]) + (12643*ArcTan[(3+10*x)/Sqrt[31]])/(165044*Sqrt[31]) + (19*Log[3-x+2*x^2])/10648 - (19*Log[2+3*x+5*x^2])/10648$

Rubi [A] time = 0.27894, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\begin{aligned} & -\frac{25(117-137x)}{172546(5x^2+3x+2)} + \frac{13-6x}{506(2x^2-x+3)(5x^2+3x+2)} + \frac{19\log(2x^2-x+3)}{10648} \\ & -\frac{19\log(5x^2+3x+2)}{10648} + \frac{2769\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{122452\sqrt{23}} + \frac{12643\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{165044\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3-x+2*x^2)^2*(2+3*x+5*x^2)^2),x]

[Out] $(-25*(117-137*x))/(172546*(2+3*x+5*x^2)) + (13-6*x)/(506*(3-x+2*x^2)*(2+3*x+5*x^2)) + (2769*ArcTan[(1-4*x)/Sqrt[23]])/(122452*Sqrt[23]) + (12643*ArcTan[(3+10*x)/Sqrt[31]])/(165044*Sqrt[31]) + (19*Log[3-x+2*x^2])/10648 - (19*Log[2+3*x+5*x^2])/10648$

Rubi in Sympy [A] time = 75.7914, size = 116, normalized size = 0.91

$$\begin{aligned} & -\frac{-331540x+647834}{41756132(2x^2-x+3)} + \frac{715x+44}{7502(2x^2-x+3)(5x^2+3x+2)} + \frac{19\log(2x^2-x+3)}{10648} \\ & -\frac{19\log(5x^2+3x+2)}{10648} - \frac{2769\sqrt{23}\operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{2816396} + \frac{12643\sqrt{31}\operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{5116364} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**2,x)`

[Out]
$$\begin{aligned} & -(-331540x + 647834)/(41756132(2x^2 - x + 3)) + (715x + 44)/ \\ & (7502(2x^2 - x + 3)(5x^2 + 3x + 2)) + 19\log(2x^2 - x + 3)/10648 - 19\log(5x^2 + 3x + 2)/10648 - 2769\sqrt{23}\operatorname{atan}(\sqrt{23}) \\ & (4x/23 - 1/23)/2816396 + 12643\sqrt{31}\operatorname{atan}(\sqrt{31})(10x/31 + 3/31)/5116364 \end{aligned}$$

Mathematica [A] time = 0.101342, size = 106, normalized size = 0.83

$$\frac{9659011 \log(2x^2 - x + 3) - 9659011 \log(5x^2 + 3x + 2) + \frac{31372(6850x^3 - 9275x^2 + 11154x - 4342)}{10x^4 + x^3 + 16x^2 + 7x + 6} - 5322018\sqrt{23} \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right) + 13376294\sqrt{31} \operatorname{ArcTan}\left(\frac{3+10x}{\sqrt{31}}\right) + 9659011 \operatorname{Log}[3 - x + 2x^2] - 9659011 \operatorname{Log}[2 + 3x + 5x^2]}{5413113112}$$

Antiderivative was successfully verified.

[In] `Integrate[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2),x]`

[Out]
$$\begin{aligned} & ((31372(-4342 + 11154x - 9275x^2 + 6850x^3))/(6 + 7x + 16x^2 + x^3 + 10x^4) - 5322018\sqrt{23}\operatorname{ArcTan}[(-1 + 4x)/\sqrt{23}] \\ & + 13376294\sqrt{31}\operatorname{ArcTan}[(3 + 10x)/\sqrt{31}] + 9659011\operatorname{Log}[3 - x + 2x^2] - 9659011\operatorname{Log}[2 + 3x + 5x^2])/5413113112 \end{aligned}$$

Maple [A] time = 0.013, size = 94, normalized size = 0.7

$$\begin{aligned} & -\frac{1}{5324} \left(-\frac{759x}{31} + \frac{1078}{155} \right) \left(x^2 + \frac{3x}{5} + \frac{2}{5} \right)^{-1} - \frac{19 \ln(25x^2 + 15x + 10)}{10648} \\ & + \frac{12643\sqrt{31}}{5116364} \operatorname{arctan}\left(\frac{(50x + 15)\sqrt{31}}{155}\right) + \frac{1}{5324} \left(-\frac{77x}{23} - \frac{341}{46} \right) \left(x^2 - \frac{x}{2} + \frac{3}{2} \right)^{-1} \\ & + \frac{19 \ln(4x^2 - 2x + 6)}{10648} - \frac{2769\sqrt{23}}{2816396} \operatorname{arctan}\left(\frac{(8x - 2)\sqrt{23}}{46}\right) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^2/(5*x^2+3*x+2)^2,x)`

[Out]
$$\begin{aligned} & -1/5324*(-759/31*x+1078/155)/(x^2+3/5*x+2/5)-19/10648*\ln(25*x^2+15*x+10)+12643/5116364*31^(1/2)*\operatorname{arctan}(1/155*(50*x+15)*31^(1/2))+1 \\ & /5324*(-77/23*x-341/46)/(x^2-1/2*x+3/2)+19/10648*\ln(4*x^2-2*x+6)-2769/2816396*23^(1/2)*\operatorname{arctan}(1/46*(8*x-2)*23^(1/2)) \end{aligned}$$

Maxima [A] time = 0.770609, size = 130, normalized size = 1.02

$$\frac{12643}{5116364} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) - \frac{2769}{2816396} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{6850x^3 - 9275x^2 + 11154x - 4342}{172546(10x^4 + x^3 + 16x^2 + 7x + 6)} - \frac{19}{10648} \log(5x^2 + 3x + 2) + \frac{19}{10648} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2),x, algorithm="maxima")

[Out] 12643/5116364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2769/2816396*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/172546*(6850*x^3 - 9275*x^2 + 11154*x - 4342)/(10*x^4 + x^3 + 16*x^2 + 7*x + 6) - 19/10648*log(5*x^2 + 3*x + 2) + 19/10648*log(2*x^2 - x + 3)

Fricas [A] time = 0.272488, size = 262, normalized size = 2.06

$$\sqrt{31}\sqrt{23}\left(13547\sqrt{31}\sqrt{23}(10x^4 + x^3 + 16x^2 + 7x + 6) \log(5x^2 + 3x + 2) - 13547\sqrt{31}\sqrt{23}(10x^4 + x^3 + 16x^2 + 7x + 6) \log(2x^2 - x + 3)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2),x, algorithm="fricas")

[Out] -1/5413113112*sqrt(31)*sqrt(23)*(13547*sqrt(31)*sqrt(23)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*log(5*x^2 + 3*x + 2) - 13547*sqrt(31)*sqrt(23)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*log(2*x^2 - x + 3) - 581578*sqrt(23)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*arctan(1/31*sqrt(31)*(10*x + 3)) + 171678*sqrt(31)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(6850*x^3 - 9275*x^2 + 11154*x - 4342))/(10*x^4 + x^3 + 16*x^2 + 7*x + 6)

Sympy [A] time = 0.493037, size = 122, normalized size = 0.96

$$\frac{6850x^3 - 9275x^2 + 11154x - 4342}{1725460x^4 + 172546x^3 + 2760736x^2 + 1207822x + 1035276} + \frac{19 \log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{10648} - \frac{19 \log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{10648} - \frac{2769\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{2816396} + \frac{12643\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{5116364}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**2,x)`

[Out] $(6850x^3 - 9275x^2 + 11154x - 4342)/(1725460x^4 + 172546x^3 + 2760736x^2 + 1207822x + 1035276) + 19\log(x^2 - x/2 + 3/2)/10648 - 19\log(x^2 + 3x/5 + 2/5)/10648 - 2769\sqrt{23}\operatorname{atan}(4\sqrt{23}x/23 - \sqrt{23}/23)/2816396 + 12643\sqrt{31}\operatorname{atan}(10\sqrt{31}x/31 + 3\sqrt{31}/31)/5116364$

GIAC/XCAS [A] time = 0.265824, size = 130, normalized size = 1.02

$$\frac{12643}{5116364} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{2769}{2816396} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{6850x^3 - 9275x^2 + 11154x - 4342}{172546(10x^4 + x^3 + 16x^2 + 7x + 6)} - \frac{19}{10648} \ln(5x^2 + 3x + 2) + \frac{19}{10648} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2),x, algorithm="giac")`

[Out] $12643/5116364\sqrt{31}\operatorname{arctan}(1/31\sqrt{31}(10x + 3)) - 2769/2816396\sqrt{23}\operatorname{arctan}(1/23\sqrt{23}(4x - 1)) + 1/172546(6850x^3 - 9275x^2 + 11154x - 4342)/(10x^4 + x^3 + 16x^2 + 7x + 6) - 19/10648\ln(5x^2 + 3x + 2) + 19/10648\ln(2x^2 - x + 3)$

$$3.50 \quad \int \frac{1}{(3-x+2x^2)^2(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=148

$$\begin{aligned} & -\frac{9446 - 5765x}{690184(5x^2 + 3x + 2)^2} + \frac{3996965x + 1765599}{235352744(5x^2 + 3x + 2)} + \frac{13 - 6x}{506(2x^2 - x + 3)(5x^2 + 3x + 2)^2} \\ & + \frac{97 \log(2x^2 - x + 3)}{468512} - \frac{97 \log(5x^2 + 3x + 2)}{468512} - \frac{25557 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5387888\sqrt{23}} + \frac{4464079 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{225120016\sqrt{31}} \end{aligned}$$

[Out] $-(9446 - 5765*x)/(690184*(2 + 3*x + 5*x^2)^2) + (13 - 6*x)/(506*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (1765599 + 3996965*x)/(235352744*(2 + 3*x + 5*x^2)) - (25557*ArcTan[(1 - 4*x)/Sqrt[23]])/(5387888*Sqrt[23]) + (4464079*ArcTan[(3 + 10*x)/Sqrt[31]])/(225120016*Sqrt[31]) + (97*Log[3 - x + 2*x^2])/468512 - (97*Log[2 + 3*x + 5*x^2])/468512$

Rubi [A] time = 0.365485, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\begin{aligned} & -\frac{9446 - 5765x}{690184(5x^2 + 3x + 2)^2} + \frac{3996965x + 1765599}{235352744(5x^2 + 3x + 2)} + \frac{13 - 6x}{506(2x^2 - x + 3)(5x^2 + 3x + 2)^2} \\ & + \frac{97 \log(2x^2 - x + 3)}{468512} - \frac{97 \log(5x^2 + 3x + 2)}{468512} - \frac{25557 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5387888\sqrt{23}} + \frac{4464079 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{225120016\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3), x]$

[Out] $-(9446 - 5765*x)/(690184*(2 + 3*x + 5*x^2)^2) + (13 - 6*x)/(506*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (1765599 + 3996965*x)/(235352744*(2 + 3*x + 5*x^2)) - (25557*ArcTan[(1 - 4*x)/Sqrt[23]])/(5387888*Sqrt[23]) + (4464079*ArcTan[(3 + 10*x)/Sqrt[31]])/(225120016*Sqrt[31]) + (97*Log[3 - x + 2*x^2])/468512 - (97*Log[2 + 3*x + 5*x^2])/468512$

Rubi in Sympy [A] time = 106.206, size = 143, normalized size = 0.97

$$\begin{aligned} & -\frac{-279026x + 764115}{83512264(2x^2 - x + 3)(5x^2 + 3x + 2)} + \frac{715x + 44}{15004(2x^2 - x + 3)(5x^2 + 3x + 2)^2} \\ & + \frac{10639920830x + 4700024538}{626509004528(5x^2 + 3x + 2)} + \frac{97 \log(2x^2 - x + 3)}{468512} - \frac{97 \log(5x^2 + 3x + 2)}{468512} \\ & + \frac{25557\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{123921424} + \frac{4464079\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{6978720496} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)`

[Out] `-(-279026*x + 764115)/(83512264*(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)) + (715*x + 44)/(15004*(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2) + (10639920830*x + 4700024538)/(626509004528*(5*x**2 + 3*x + 2)) + 97*log(2*x**2 - x + 3)/468512 - 97*log(5*x**2 + 3*x + 2)/468512 + 25557*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/123921424 + 4464079*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/6978720496`

Mathematica [A] time = 0.127716, size = 136, normalized size = 0.92

$$\begin{aligned} & \frac{90x - 11}{244904(2x^2 - x + 3)} + \frac{164380x + 67573}{10232728(5x^2 + 3x + 2)} + \frac{345x - 98}{30008(5x^2 + 3x + 2)^2} + \frac{97 \log(2x^2 - x + 3)}{468512} \\ & - \frac{97 \log(5x^2 + 3x + 2)}{468512} + \frac{25557 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{5387888\sqrt{23}} + \frac{4464079 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{225120016\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] `Integrate[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3),x]`

[Out] `(-11 + 90*x)/(244904*(3 - x + 2*x^2)) + (-98 + 345*x)/(30008*(2 + 3*x + 5*x^2)^2) + (67573 + 164380*x)/(10232728*(2 + 3*x + 5*x^2)) + (25557*ArcTan[(-1 + 4*x)/Sqrt[23]])/(5387888*Sqrt[23]) + (4464079*ArcTan[(3 + 10*x)/Sqrt[31]])/(225120016*Sqrt[31]) + (97*Log[3 - x + 2*x^2])/468512 - (97*Log[2 + 3*x + 5*x^2])/468512`

Maple [A] time = 0.013, size = 106, normalized size = 0.7

$$\begin{aligned} & -\frac{25}{234256 (5x^2 + 3x + 2)^2} \left(-\frac{723272x^3}{961} - \frac{3656422x^2}{4805} - \frac{14280728x}{24025} - \frac{2238016}{24025} \right) \\ & - \frac{97 \ln(125x^2 + 75x + 50)}{468512} + \frac{4464079\sqrt{31}}{6978720496} \arctan\left(\frac{(250x + 75)\sqrt{31}}{775}\right) \\ & + \frac{1}{234256} \left(\frac{990x}{23} - \frac{121}{23} \right) \left(x^2 - \frac{x}{2} + \frac{3}{2} \right)^{-1} \\ & + \frac{97 \ln(4x^2 - 2x + 6)}{468512} + \frac{25557\sqrt{23}}{123921424} \arctan\left(\frac{(8x - 2)\sqrt{23}}{46}\right) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^2/(5*x^2+3*x+2)^3,x)`

[Out] `-25/234256*(-723272/961*x^3-3656422/4805*x^2-14280728/24025*x-2238016/24025)/(5*x^2+3*x+2)^2-97/468512*ln(125*x^2+75*x+50)+4464079/6978720496*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))+1/234256*(990/23*x-121/23)/(x^2-1/2*x+3/2)+97/468512*ln(4*x^2-2*x+6)+25557/123921424*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))`

Maxima [A] time = 0.766927, size = 159, normalized size = 1.07

$$\begin{aligned} & \frac{4464079}{6978720496} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{25557}{123921424} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) \\ & + \frac{39969650x^5 + 21652955x^4 + 69648769x^3 + 47820302x^2 + 42668920x + 6976948}{235352744(50x^6 + 35x^5 + 103x^4 + 85x^3 + 83x^2 + 32x + 12)} \\ & - \frac{97}{468512} \log(5x^2 + 3x + 2) + \frac{97}{468512} \log(2x^2 - x + 3) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2),x, algorithm="maxima")`

[Out] `4464079/6978720496*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 25557/123921424*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/235352744*(39969650*x^5 + 21652955*x^4 + 69648769*x^3 + 47820302*x^2 + 42668920*x + 6976948)/(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12) - 97/468512*log(5*x^2 + 3*x + 2) + 97/468512*log(2*x^2 - x + 3)`

Fricas [A] time = 0.275344, size = 356, normalized size = 2.41

$$\frac{\sqrt{31}\sqrt{23}\left(2143991\sqrt{31}\sqrt{23}(50x^6 + 35x^5 + 103x^4 + 85x^3 + 83x^2 + 32x + 12)\log(5x^2 + 3x + 2) - 2143991\sqrt{31}\sqrt{23}(50x^6 + 35x^5 + 103x^4 + 85x^3 + 83x^2 + 32x + 12)\log(2x^2 - x + 3) - 205347634\sqrt{23}\sqrt{31}(50x^6 + 35x^5 + 103x^4 + 85x^3 + 83x^2 + 32x + 12)\arctan\left(\frac{1}{31}\sqrt{31}(10x + 3)\right) - 49120554\sqrt{31}\sqrt{23}(50x^6 + 35x^5 + 103x^4 + 85x^3 + 83x^2 + 32x + 12)\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) - 44\sqrt{31}\sqrt{23}(39969650x^5 + 21652955x^4 + 69648769x^3 + 47820302x^2 + 42668920x + 6976948)\right)}{(50x^6 + 35x^5 + 103x^4 + 85x^3 + 83x^2 + 32x + 12)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2),x, algorithm="fricas")

[Out] -1/7383486284768*sqrt(31)*sqrt(23)*(2143991*sqrt(31)*sqrt(23)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*log(5*x^2 + 3*x + 2) - 2143991*sqrt(31)*sqrt(23)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*log(2*x^2 - x + 3) - 205347634*sqrt(23)*sqrt(31)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*arctan(1/31*sqrt(31)*(10*x + 3)) - 49120554*sqrt(31)*sqrt(23)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(39969650*x^5 + 21652955*x^4 + 69648769*x^3 + 47820302*x^2 + 42668920*x + 6976948))/(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)

Sympy [A] time = 0.578618, size = 143, normalized size = 0.97

$$\frac{39969650x^5 + 21652955x^4 + 69648769x^3 + 47820302x^2 + 42668920x + 6976948}{11767637200x^6 + 8237346040x^5 + 24241332632x^4 + 20004983240x^3 + 19534277752x^2 + 7531287808x + 2824232928} + \frac{97\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{468512} - \frac{97\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{468512} + \frac{25557\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{123921424} + \frac{4464079\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{6978720496}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)

[Out] (39969650*x**5 + 21652955*x**4 + 69648769*x**3 + 47820302*x**2 + 42668920*x + 6976948)/(11767637200*x**6 + 8237346040*x**5 + 24241332632*x**4 + 20004983240*x**3 + 19534277752*x**2 + 7531287808*x + 2824232928) + 97*log(x**2 - x/2 + 3/2)/468512 - 97*log(x**2 + 3*x/5 + 2/5)/468512 + 25557*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/123921424 + 4464079*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/6978720496

GIAC/XCAS [A] time = 0.266338, size = 149, normalized size = 1.01

$$\begin{aligned} & \frac{4464079}{6978720496} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) + \frac{25557}{123921424} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) \\ & + \frac{39969650x^5 + 21652955x^4 + 69648769x^3 + 47820302x^2 + 42668920x + 6976948}{235352744(5x^2 + 3x + 2)^2(2x^2 - x + 3)} \\ & - \frac{97}{468512} \ln(5x^2 + 3x + 2) + \frac{97}{468512} \ln(2x^2 - x + 3) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2),x, algorithm="giac")

[Out] 4464079/6978720496*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 25557/123921424*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/235352744*(39969650*x^5 + 21652955*x^4 + 69648769*x^3 + 47820302*x^2 + 42668920*x + 6976948)/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)) - 97/468512*ln(5*x^2 + 3*x + 2) + 97/468512*ln(2*x^2 - x + 3)

$$3.51 \quad \int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^3} dx$$

Optimal. Leaf size=98

$$\begin{aligned} & \frac{625x^3}{24} + \frac{4875x^2}{32} + \frac{1331(76420x + 5229)}{135424(2x^2 - x + 3)} - \frac{14641(79x + 101)}{5888(2x^2 - x + 3)^2} \\ & - \frac{13915}{64} \log(2x^2 - x + 3) + \frac{2725x}{8} + \frac{63799791 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16928\sqrt{23}} \end{aligned}$$

[Out] (2725*x)/8 + (4875*x^2)/32 + (625*x^3)/24 - (14641*(101 + 79*x))/(5888*(3 - x + 2*x^2)^2) + (1331*(5229 + 76420*x))/(135424*(3 - x + 2*x^2)) + (63799791*ArcTan[(1 - 4*x)/Sqrt[23]])/(16928*Sqrt[23]) - (13915*Log[3 - x + 2*x^2])/64

Rubi [A] time = 0.17256, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\begin{aligned} & \frac{625x^3}{24} + \frac{4875x^2}{32} + \frac{1331(76420x + 5229)}{135424(2x^2 - x + 3)} - \frac{14641(79x + 101)}{5888(2x^2 - x + 3)^2} \\ & - \frac{13915}{64} \log(2x^2 - x + 3) + \frac{2725x}{8} + \frac{63799791 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16928\sqrt{23}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^3, x]

[Out] (2725*x)/8 + (4875*x^2)/32 + (625*x^3)/24 - (14641*(101 + 79*x))/(5888*(3 - x + 2*x^2)^2) + (1331*(5229 + 76420*x))/(135424*(3 - x + 2*x^2)) + (63799791*ArcTan[(1 - 4*x)/Sqrt[23]])/(16928*Sqrt[23]) - (13915*Log[3 - x + 2*x^2])/64

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & -\frac{625x^5}{46} - \frac{7875x^4}{184} - \frac{8575x^3}{552} - \frac{1331(-8249x + 1677)}{33856(2x^2 - x + 3)} - \frac{(-4x + 1)(5x^2 + 3x + 2)^4}{46(2x^2 - x + 3)^2} \\ & - \frac{13915 \log(2x^2 - x + 3)}{64} - \frac{63799791\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{389344} - \frac{\int\left(-\frac{335319}{16}\right) dx}{46} + \frac{35215 \int x dx}{92} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**3,x)`

[Out] $-625x^5/46 - 7875x^4/184 - 8575x^3/552 - 1331(-8249x + 1677)/(33856(2x^2 - x + 3)) - (-4x + 1)(5x^2 + 3x + 2)^4/(46(2x^2 - x + 3)^2) - 13915 \log(2x^2 - x + 3)/64 - 63799791 \sqrt{23} \operatorname{atan}(\sqrt{23}(4x/23 - 1/23))/389344 - \operatorname{Integral}(-335319/16, x)/46 + 35215 \operatorname{Integral}(x, x)/92$

Mathematica [A] time = 0.0706951, size = 98, normalized size = 1.

$$\frac{625x^3}{24} + \frac{4875x^2}{32} + \frac{1331(76420x + 5229)}{135424(2x^2 - x + 3)} - \frac{14641(79x + 101)}{5888(2x^2 - x + 3)^2} - \frac{13915}{64} \log(2x^2 - x + 3) + \frac{2725x}{8} - \frac{63799791 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{16928\sqrt{23}}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^3,x]`

[Out] $(2725x)/8 + (4875x^2)/32 + (625x^3)/24 - (14641(101 + 79x))/(5888(3 - x + 2x^2)^2) + (1331(5229 + 76420x))/(135424(3 - x + 2x^2)) - (63799791 \operatorname{ArcTan}[-1 + 4x]/\operatorname{Sqrt}[23])/(16928 \operatorname{Sqrt}[23]) - (13915 \operatorname{Log}[3 - x + 2x^2])/64$

Maple [A] time = 0.012, size = 73, normalized size = 0.7

$$\frac{625x^3}{24} + \frac{4875x^2}{32} + \frac{2725x}{8} - \frac{121}{4(2x^2 - x + 3)^2} \left(-\frac{210155x^3}{4232} + \frac{362791x^2}{16928} - \frac{561121x}{8464} + \frac{54263}{16928} \right) - \frac{13915 \ln(8x^2 - 4x + 12)}{64} - \frac{63799791 \sqrt{23}}{389344} \arctan\left(\frac{(16x - 4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4/(2*x^2-x+3)^3,x)`

[Out] $625/24x^3 + 4875/32x^2 + 2725/8x - 121/4(-210155/4232x^3 + 362791/16928x^2 - 561121/8464x + 54263/16928)/(2x^2 - x + 3)^2 - 13915/64 \ln(8x^2 - 4x + 12) - 63799791/389344 \cdot 23^{1/2} \arctan(1/92(16x - 4) \cdot 23^{1/2})$

Maxima [A] time = 0.774088, size = 111, normalized size = 1.13

$$\frac{625}{24}x^3 + \frac{4875}{32}x^2 - \frac{63799791}{389344}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{2725}{8}x$$

$$+ \frac{1331(76420x^3 - 32981x^2 + 102022x - 4933)}{67712(4x^4 - 4x^3 + 13x^2 - 6x + 9)} - \frac{13915}{64}\log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^3,x, algorithm="maxima")

[Out] 625/24*x^3 + 4875/32*x^2 - 63799791/389344*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 2725/8*x + 1331/67712*(76420*x^3 - 32981*x^2 + 102022*x - 4933)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9) - 13915/64*log(2*x^2 - x + 3)

Fricas [A] time = 0.263768, size = 185, normalized size = 1.89

$$\frac{\sqrt{23}\left(44166210\sqrt{23}(4x^4 - 4x^3 + 13x^2 - 6x + 9)\log(2x^2 - x + 3) + 765597492(4x^4 - 4x^3 + 13x^2 - 6x + 9)\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)\right)}{46721228}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^3,x, algorithm="fricas")

[Out] -1/46721228*sqrt(23)*(44166210*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(2*x^2 - x + 3) + 765597492*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(1/23*sqrt(23)*(4*x - 1)) - sqrt(23)*(21160000*x^4 + 102626000*x^6 + 221756800*x^5 + 93791700*x^4 + 1066587660*x^3 - 268333833*x^2 + 1030112646*x - 19697469))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

Sympy [A] time = 0.285192, size = 95, normalized size = 0.97

$$\frac{625x^3}{24} + \frac{4875x^2}{32} + \frac{2725x}{8} + \frac{101715020x^3 - 43897711x^2 + 135791282x - 6565823}{270848x^4 - 270848x^3 + 880256x^2 - 406272x + 609408}$$

$$- \frac{13915\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{64} - \frac{63799791\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{389344}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**3,x)

[Out] 625*x**3/24 + 4875*x**2/32 + 2725*x/8 + (101715020*x**3 - 43897711*x**2 + 135791282*x - 6565823)/(270848*x**4 - 270848*x**3 + 880256*x**2 - 406272*x + 609408) - 13915*log(x**2 - x/2 + 3/2)/64 - 63799791*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/389344

GIAC/XCAS [A] time = 0.265993, size = 97, normalized size = 0.99

$$\frac{625}{24}x^3 + \frac{4875}{32}x^2 - \frac{63799791}{389344}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{2725}{8}x + \frac{1331(76420x^3 - 32981x^2 + 102022x - 4933)}{67712(2x^2 - x + 3)^2} - \frac{13915}{64}\ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^3,x, algorithm="giac")

[Out] 625/24*x^3 + 4875/32*x^2 - 63799791/389344*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 2725/8*x + 1331/67712*(76420*x^3 - 32981*x^2 + 102022*x - 4933)/(2*x^2 - x + 3)^2 - 13915/64*ln(2*x^2 - x + 3)

$$3.52 \quad \int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^3} dx$$

Optimal. Leaf size=84

$$\frac{121(21193 - 12828x)}{33856(2x^2 - x + 3)} - \frac{1331(17 - 45x)}{1472(2x^2 - x + 3)^2} + \frac{825}{32} \log(2x^2 - x + 3) + \frac{125x}{8} + \frac{165099 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8464\sqrt{23}}$$

[Out] (125*x)/8 - (1331*(17 - 45*x))/(1472*(3 - x + 2*x^2)^2) + (121*(21193 - 12828*x))/(33856*(3 - x + 2*x^2)) + (165099*ArcTan[(1 - 4*x)/Sqrt[23]])/(8464*Sqrt[23]) + (825*Log[3 - x + 2*x^2])/32

Rubi [A] time = 0.149614, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(21193 - 12828x)}{33856(2x^2 - x + 3)} - \frac{1331(17 - 45x)}{1472(2x^2 - x + 3)^2} + \frac{825}{32} \log(2x^2 - x + 3) + \frac{125x}{8} + \frac{165099 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8464\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^3, x]

[Out] (125*x)/8 - (1331*(17 - 45*x))/(1472*(3 - x + 2*x^2)^2) + (121*(21193 - 12828*x))/(33856*(3 - x + 2*x^2)) + (165099*ArcTan[(1 - 4*x)/Sqrt[23]])/(8464*Sqrt[23]) + (825*Log[3 - x + 2*x^2])/32

Rubi in Sympy [F] time = 0., size = 0, normalized size = 0.

$$\begin{aligned} & -\frac{125x^3}{46} + \frac{14883(-7x + 19)}{8464(2x^2 - x + 3)} - \frac{(-4x + 1)(5x^2 + 3x + 2)^3}{46(2x^2 - x + 3)^2} + \frac{825 \log(2x^2 - x + 3)}{32} \\ & - \frac{165099\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{194672} - \frac{\int\left(-\frac{1155}{2}\right) dx}{46} - \frac{1275 \int x dx}{92} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**3, x)

[Out] -125*x**3/46 + 14883*(-7*x + 19)/(8464*(2*x**2 - x + 3)) - (-4*x + 1)*(5*x**2 + 3*x + 2)**3/(46*(2*x**2 - x + 3)**2) + 825*log(2*x

$**2 - x + 3)/32 - 165099*\text{sqrt}(23)*\text{atan}(\text{sqrt}(23)*(4*x/23 - 1/23))/$
 $194672 - \text{Integral}(-1155/2, x)/46 - 1275*\text{Integral}(x, x)/92$

Mathematica [A] time = 0.0696539, size = 84, normalized size = 1.

$$-\frac{121(12828x - 21193)}{33856(2x^2 - x + 3)} + \frac{1331(45x - 17)}{1472(2x^2 - x + 3)^2} + \frac{825}{32} \log(2x^2 - x + 3) + \frac{125x}{8} - \frac{165099 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{8464\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^3, x]

[Out] (125*x)/8 + (1331*(-17 + 45*x))/(1472*(3 - x + 2*x^2)^2) - (121*(-21193 + 12828*x))/(33856*(3 - x + 2*x^2)) - (165099*ArcTan[(-1 + 4*x)/Sqrt[23]])/(8464*Sqrt[23]) + (825*Log[3 - x + 2*x^2])/32

Maple [A] time = 0.01, size = 63, normalized size = 0.8

$$\frac{125x}{8} + \frac{11}{2(2x^2 - x + 3)^2} \left(-\frac{35277x^3}{2116} + \frac{303677x^2}{8464} - \frac{132803x}{4232} + \frac{326029}{8464} \right) + \frac{825 \ln(8x^2 - 4x + 12)}{32} - \frac{165099\sqrt{23}}{194672} \arctan\left(\frac{(16x - 4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^3/(2*x^2-x+3)^3, x)

[Out] 125/8*x+11/2*(-35277/2116*x^3+303677/8464*x^2-132803/4232*x+326029/8464)/(2*x^2-x+3)^2+825/32*ln(8*x^2-4*x+12)-165099/194672*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))

Maxima [A] time = 0.769468, size = 97, normalized size = 1.15

$$-\frac{165099}{194672} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{125}{8} x - \frac{121(12828x^3 - 27607x^2 + 24146x - 29639)}{16928(4x^4 - 4x^3 + 13x^2 - 6x + 9)} + \frac{825}{32} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^3,x, algorithm="maxima")

[Out] -165099/194672*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 125/8*x
 - 121/16928*(12828*x^3 - 27607*x^2 + 24146*x - 29639)/(4*x^4 - 4
 *x^3 + 13*x^2 - 6*x + 9) + 825/32*log(2*x^2 - x + 3)

Fricas [A] time = 0.265633, size = 170, normalized size = 2.02

$$\frac{\sqrt{23}\left(436425\sqrt{23}(4x^4 - 4x^3 + 13x^2 - 6x + 9)\log(2x^2 - x + 3) - 330198(4x^4 - 4x^3 + 13x^2 - 6x + 9)\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right)\right)}{389344(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^3,x, algorithm="fricas")

[Out] 1/389344*sqrt(23)*(436425*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x
 + 9)*log(2*x^2 - x + 3) - 330198*(4*x^4 - 4*x^3 + 13*x^2 - 6*x +
 9)*arctan(1/23*sqrt(23)*(4*x - 1)) + sqrt(23)*(1058000*x^5 - 1058
 000*x^4 + 1886312*x^3 + 1753447*x^2 - 541166*x + 3586319))/(4*x^4
 - 4*x^3 + 13*x^2 - 6*x + 9)

Sympy [A] time = 0.281622, size = 82, normalized size = 0.98

$$\frac{125x}{8} - \frac{1552188x^3 - 3340447x^2 + 2921666x - 3586319}{67712x^4 - 67712x^3 + 220064x^2 - 101568x + 152352} + \frac{825\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{32} - \frac{165099\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{194672}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**3,x)

[Out] 125*x/8 - (1552188*x**3 - 3340447*x**2 + 2921666*x - 3586319)/(67
 712*x**4 - 67712*x**3 + 220064*x**2 - 101568*x + 152352) + 825*lo
 g(x**2 - x/2 + 3/2)/32 - 165099*sqrt(23)*atan(4*sqrt(23)*x/23 - s
 qrt(23)/23)/194672

GIAC/XCAS [A] time = 0.265513, size = 84, normalized size = 1.

$$-\frac{165099}{194672} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{125}{8} x - \frac{121(12828x^3 - 27607x^2 + 24146x - 29639)}{16928(2x^2 - x + 3)^2} + \frac{825}{32} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^3,x, algorithm="giac")

[Out] -165099/194672*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 125/8*x - 121/16928*(12828*x^3 - 27607*x^2 + 24146*x - 29639)/(2*x^2 - x + 3)^2 + 825/32*ln(2*x^2 - x + 3)

$$3.53 \quad \int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^3} dx$$

Optimal. Leaf size=64

$$\frac{121(19-7x)}{368(2x^2-x+3)^2} - \frac{55(332x+975)}{8464(2x^2-x+3)} - \frac{4330 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

[Out] (121*(19 - 7*x))/(368*(3 - x + 2*x^2)^2) - (55*(975 + 332*x))/(8464*(3 - x + 2*x^2)) - (4330*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt[23])

Rubi [A] time = 0.0964378, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{121(19-7x)}{368(2x^2-x+3)^2} - \frac{55(332x+975)}{8464(2x^2-x+3)} - \frac{4330 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^3, x]

[Out] (121*(19 - 7*x))/(368*(3 - x + 2*x^2)^2) - (55*(975 + 332*x))/(8464*(3 - x + 2*x^2)) - (4330*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt[23])

Rubi in Sympy [A] time = 45.7313, size = 71, normalized size = 1.11

$$-\frac{25x}{46} - \frac{(-4x+1)(5x^2+3x+2)^2}{46(2x^2-x+3)^2} - \frac{11(323x+201)}{2116(2x^2-x+3)} + \frac{4330\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**3, x)

[Out] -25*x/46 - (-4*x + 1)*(5*x**2 + 3*x + 2)**2/(46*(2*x**2 - x + 3)**2) - 11*(323*x + 201)/(2116*(2*x**2 - x + 3)) + 4330*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/12167

Mathematica [A] time = 0.0610723, size = 51, normalized size = 0.8

$$\frac{4330 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{529\sqrt{23}} - \frac{11(1660x^3 + 4045x^2 + 938x + 4909)}{4232(-2x^2 + x - 3)^2}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^3, x]

[Out] (-11*(4909 + 938*x + 4045*x^2 + 1660*x^3))/(4232*(-3 + x - 2*x^2)^2) + (4330*ArcTan[(-1 + 4*x)/Sqrt[23]])/(529*Sqrt[23])

Maple [A] time = 0.008, size = 47, normalized size = 0.7

$$4 \frac{1}{(2x^2 - x + 3)^2} \left(-\frac{4565x^3}{4232} - \frac{44495x^2}{16928} - \frac{5159x}{8464} - \frac{53999}{16928} \right) + \frac{4330\sqrt{23}}{12167} \arctan\left(\frac{(16x-4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^2/(2*x^2-x+3)^3, x)

[Out] 4*(-4565/4232*x^3-44495/16928*x^2-5159/8464*x-53999/16928)/(2*x^2-x+3)^2+4330/12167*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))

Maxima [A] time = 0.76933, size = 76, normalized size = 1.19

$$\frac{4330}{12167} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) - \frac{11(1660x^3 + 4045x^2 + 938x + 4909)}{4232(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^3, x, algorithm="maxima")

[Out] 4330/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/4232*(1660*x^3 + 4045*x^2 + 938*x + 4909)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

Fricas [A] time = 0.265559, size = 109, normalized size = 1.7

$$\frac{\sqrt{23} \left(34640 (4x^4 - 4x^3 + 13x^2 - 6x + 9) \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - 11 \sqrt{23} (1660x^3 + 4045x^2 + 938x + 4909) \right)}{97336 (4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^3,x, algorithm="fricas")

[Out] 1/97336*sqrt(23)*(34640*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11*sqrt(23)*(1660*x^3 + 4045*x^2 + 938*x + 4909))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

Sympy [A] time = 0.243519, size = 61, normalized size = 0.95

$$-\frac{18260x^3 + 44495x^2 + 10318x + 53999}{16928x^4 - 16928x^3 + 55016x^2 - 25392x + 38088} + \frac{4330\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**3,x)

[Out] -(18260*x**3 + 44495*x**2 + 10318*x + 53999)/(16928*x**4 - 16928*x**3 + 55016*x**2 - 25392*x + 38088) + 4330*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/12167

GIAC/XCAS [A] time = 0.263694, size = 62, normalized size = 0.97

$$\frac{4330}{12167} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{11 (1660x^3 + 4045x^2 + 938x + 4909)}{4232(2x^2 - x + 3)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^3,x, algorithm="giac")

[Out] 4330/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/4232*(1660*x^3 + 4045*x^2 + 938*x + 4909)/(2*x^2 - x + 3)^2

$$3.54 \quad \int \frac{2+3x+5x^2}{(3-x+2x^2)^3} dx$$

Optimal. Leaf size=64

$$-\frac{131(1-4x)}{2116(2x^2-x+3)} - \frac{11(3x+5)}{92(2x^2-x+3)^2} - \frac{262 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

[Out] $(-11*(5 + 3*x))/(92*(3 - x + 2*x^2)^2) - (131*(1 - 4*x))/(2116*(3 - x + 2*x^2)) - (262*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt[23])$

Rubi [A] time = 0.0648295, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$

$$-\frac{131(1-4x)}{2116(2x^2-x+3)} - \frac{11(3x+5)}{92(2x^2-x+3)^2} - \frac{262 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^3, x]

[Out] $(-11*(5 + 3*x))/(92*(3 - x + 2*x^2)^2) - (131*(1 - 4*x))/(2116*(3 - x + 2*x^2)) - (262*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt[23])$

Rubi in Sympy [A] time = 10.737, size = 54, normalized size = 0.84

$$-\frac{131(-4x+1)}{2116(2x^2-x+3)} - \frac{33x+55}{92(2x^2-x+3)^2} + \frac{262\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**3, x)

[Out] $-131*(-4*x + 1)/(2116*(2*x**2 - x + 3)) - (33*x + 55)/(92*(2*x**2 - x + 3)**2) + 262*\sqrt{23}*\operatorname{atan}(\sqrt{23}*(4*x/23 - 1/23))/12167$

Mathematica [A] time = 0.0531866, size = 51, normalized size = 0.8

$$\frac{\frac{46(524x^3 - 393x^2 + 472x - 829)}{(-2x^2 + x - 3)^2} + 1048\sqrt{23} \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{48668}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^3, x]

[Out] ((46*(-829 + 472*x - 393*x^2 + 524*x^3))/(-3 + x - 2*x^2)^2 + 1048*sqrt[23]*ArcTan[(-1 + 4*x)/sqrt[23]])/48668

Maple [A] time = 0.008, size = 47, normalized size = 0.7

$$4 \frac{1}{(2x^2 - x + 3)^2} \left(\frac{131x^3}{1058} - \frac{393x^2}{4232} + \frac{59x}{529} - \frac{829}{4232} \right) + \frac{262\sqrt{23}}{12167} \arctan\left(\frac{(16x-4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)/(2*x^2-x+3)^3, x)

[Out] 4*(131/1058*x^3-393/4232*x^2+59/529*x-829/4232)/(2*x^2-x+3)^2+262/12167*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))

Maxima [A] time = 0.762616, size = 76, normalized size = 1.19

$$\frac{262}{12167} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{524x^3 - 393x^2 + 472x - 829}{1058(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^3, x, algorithm="maxima")

[Out] 262/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/1058*(524*x^3 - 393*x^2 + 472*x - 829)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

Fricas [A] time = 0.26332, size = 108, normalized size = 1.69

$$\frac{\sqrt{23}\left(524(4x^4 - 4x^3 + 13x^2 - 6x + 9) \arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \sqrt{23}(524x^3 - 393x^2 + 472x - 829)\right)}{24334(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^3,x, algorithm="fricas")`

[Out] $\frac{1}{24334} \sqrt{23} (524(4x^4 - 4x^3 + 13x^2 - 6x + 9) \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \sqrt{23}(524x^3 - 393x^2 + 472x - 829)) / (4x^4 - 4x^3 + 13x^2 - 6x + 9)$

Sympy [A] time = 0.232826, size = 61, normalized size = 0.95

$$\frac{524x^3 - 393x^2 + 472x - 829}{4232x^4 - 4232x^3 + 13754x^2 - 6348x + 9522} + \frac{262\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)/(2*x**2-x+3)**3,x)`

[Out] $(524x^3 - 393x^2 + 472x - 829) / (4232x^4 - 4232x^3 + 13754x^2 - 6348x + 9522) + 262 \sqrt{23} \operatorname{atan}(4 \sqrt{23} x / 23 - \sqrt{23} / 23) / 12167$

GIAC/XCAS [A] time = 0.26231, size = 62, normalized size = 0.97

$$\frac{262}{12167} \sqrt{23} \operatorname{arctan}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{524x^3 - 393x^2 + 472x - 829}{1058(2x^2 - x + 3)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^3,x, algorithm="giac")`

[Out] $\frac{262}{12167} \sqrt{23} \operatorname{arctan}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{1}{1058} (524x^3 - 393x^2 + 472x - 829) / (2x^2 - x + 3)^2$

$$3.55 \quad \int \frac{1}{(3-x+2x^2)^3(2+3x+5x^2)} dx$$

Optimal. Leaf size=115

$$\begin{aligned} & \frac{3625 - 746x}{256036(2x^2 - x + 3)} + \frac{13 - 6x}{1012(2x^2 - x + 3)^2} - \frac{119 \log(2x^2 - x + 3)}{21296} \\ & + \frac{119 \log(5x^2 + 3x + 2)}{21296} - \frac{53403 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5632792\sqrt{23}} + \frac{247 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10648\sqrt{31}} \end{aligned}$$

[Out] (13 - 6*x)/(1012*(3 - x + 2*x^2)^2) + (3625 - 746*x)/(256036*(3 - x + 2*x^2)) - (53403*ArcTan[(1 - 4*x)/Sqrt[23]])/(5632792*Sqrt[23]) + (247*ArcTan[(3 + 10*x)/Sqrt[31]])/(10648*Sqrt[31]) - (119*Log[3 - x + 2*x^2])/21296 + (119*Log[2 + 3*x + 5*x^2])/21296

Rubi [A] time = 0.280958, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\begin{aligned} & \frac{3625 - 746x}{256036(2x^2 - x + 3)} + \frac{13 - 6x}{1012(2x^2 - x + 3)^2} - \frac{119 \log(2x^2 - x + 3)}{21296} \\ & + \frac{119 \log(5x^2 + 3x + 2)}{21296} - \frac{53403 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5632792\sqrt{23}} + \frac{247 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10648\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)), x]

[Out] (13 - 6*x)/(1012*(3 - x + 2*x^2)^2) + (3625 - 746*x)/(256036*(3 - x + 2*x^2)) - (53403*ArcTan[(1 - 4*x)/Sqrt[23]])/(5632792*Sqrt[23]) + (247*ArcTan[(3 + 10*x)/Sqrt[31]])/(10648*Sqrt[31]) - (119*Log[3 - x + 2*x^2])/21296 + (119*Log[2 + 3*x + 5*x^2])/21296

Rubi in Sympy [A] time = 77.8536, size = 107, normalized size = 0.93

$$\begin{aligned} & \frac{-180532x + 877250}{61960712(2x^2 - x + 3)} + \frac{-66x + 143}{11132(2x^2 - x + 3)^2} - \frac{119 \log(2x^2 - x + 3)}{21296} \\ & + \frac{119 \log(5x^2 + 3x + 2)}{21296} + \frac{53403\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{129554216} + \frac{247\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{330088} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2), x)`

[Out] $(-180532x + 877250)/(61960712(2x^2 - x + 3)) + (-66x + 143)/(11132(2x^2 - x + 3)^2) - 119 \log(2x^2 - x + 3)/21296 + 119 \log(5x^2 + 3x + 2)/21296 + 53403 \sqrt{23} \operatorname{atan}(\sqrt{23}(4x/23 - 1/23))/129554216 + 247 \sqrt{31} \operatorname{atan}(\sqrt{31}(10x/31 + 3/31))/330088$

Mathematica [A] time = 0.33811, size = 99, normalized size = 0.86

$$\frac{713 \left(-62951 \log(2x^2 - x + 3) + 62951 \log(5x^2 + 3x + 2) - \frac{44(1492x^3 - 7996x^2 + 7381x - 14164)}{(-2x^2 + x - 3)^2} \right) + 3310986\sqrt{23} \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right) + 60}{8032361392}$$

Antiderivative was successfully verified.

[In] `Integrate[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)), x]`

[Out] $(3310986 \sqrt{23} \operatorname{ArcTan}[-1 + 4x]/\sqrt{23}] + 6010498 \sqrt{31} \operatorname{ArcTan}[3 + 10x]/\sqrt{31}] + 713 \left((-44(-14164 + 7381x - 7996x^2 + 1492x^3))/(-3 + x - 2x^2)^2 - 62951 \operatorname{Log}[3 - x + 2x^2] + 62951 \operatorname{Log}[2 + 3x + 5x^2] \right) / 8032361392$

Maple [A] time = 0.01, size = 89, normalized size = 0.8

$$\begin{aligned} & \frac{119 \ln(5x^2 + 3x + 2)}{21296} + \frac{247 \sqrt{31}}{330088} \arctan\left(\frac{(3 + 10x) \sqrt{31}}{31}\right) \\ & - \frac{1}{2662 (2x^2 - x + 3)^2} \left(\frac{8206 x^3}{529} - \frac{43978 x^2}{529} + \frac{81191 x}{1058} - \frac{77902}{529} \right) \\ & - \frac{119 \ln(8x^2 - 4x + 12)}{21296} + \frac{53403 \sqrt{23}}{129554216} \arctan\left(\frac{(16x - 4) \sqrt{23}}{92}\right) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^3/(5*x^2+3*x+2), x)`

[Out] $119/21296 \ln(5x^2 + 3x + 2) + 247/330088 \arctan(1/31(3 + 10x)) \sqrt{31}^{1/2} - 1/2662 \left(\frac{8206}{529} x^3 - \frac{43978}{529} x^2 + \frac{81191}{1058} x - \frac{77902}{529} \right) / (2x^2 - x + 3)^2 - 119/21296 \ln(8x^2 - 4x + 12) + 53403/129554216 \sqrt{23} \arctan(1/92(16x - 4)) \sqrt{23}^{1/2}$

Maxima [A] time = 0.767025, size = 132, normalized size = 1.15

$$\frac{247}{330088} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) + \frac{53403}{129554216} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) - \frac{1492x^3 - 7996x^2 + 7381x - 14164}{256036(4x^4 - 4x^3 + 13x^2 - 6x + 9)} + \frac{119}{21296} \log(5x^2 + 3x + 2) - \frac{119}{21296} \log(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3),x, algorithm="maxima")

[Out] 247/330088*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 53403/129554216*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/256036*(1492*x^3 - 7996*x^2 + 7381*x - 14164)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9) + 119/21296*log(5*x^2 + 3*x + 2) - 119/21296*log(2*x^2 - x + 3)

Fricas [A] time = 0.271669, size = 275, normalized size = 2.39

$$\sqrt{31}\sqrt{23}\left(62951\sqrt{31}\sqrt{23}(4x^4 - 4x^3 + 13x^2 - 6x + 9)\log(5x^2 + 3x + 2) - 62951\sqrt{31}\sqrt{23}(4x^4 - 4x^3 + 13x^2 - 6x + 9)\log(2x^2 - x + 3)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3),x, algorithm="fricas")

[Out] 1/8032361392*sqrt(31)*sqrt(23)*(62951*sqrt(31)*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(5*x^2 + 3*x + 2) - 62951*sqrt(31)*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(2*x^2 - x + 3) + 261326*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(1/31*sqrt(31)*(10*x + 3)) + 106806*sqrt(31)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(1492*x^3 - 7996*x^2 + 7381*x - 14164))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

Sympy [A] time = 0.486023, size = 122, normalized size = 1.06

$$-\frac{1492x^3 - 7996x^2 + 7381x - 14164}{1024144x^4 - 1024144x^3 + 3328468x^2 - 1536216x + 2304324} - \frac{119 \log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{21296} + \frac{119 \log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{21296} + \frac{53403\sqrt{23} \operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{129554216} + \frac{247\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{330088}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2),x)

[Out] $-(1492x^3 - 7996x^2 + 7381x - 14164)/(1024144x^4 - 1024144x^3 + 3328468x^2 - 1536216x + 2304324) - 119 \log(x^2 - x/2 + 3/2)/21296 + 119 \log(x^2 + 3x/5 + 2/5)/21296 + 53403 \sqrt{23} \operatorname{atan}(4 \sqrt{23} x/23 - \sqrt{23}/23)/129554216 + 247 \sqrt{31} \operatorname{atan}(10 \sqrt{31} x/31 + 3 \sqrt{31}/31)/330088$

GIAC/XCAS [A] time = 0.265309, size = 119, normalized size = 1.03

$$\frac{247}{330088} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) + \frac{53403}{129554216} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{1492x^3 - 7996x^2 + 7381x - 14164}{256036(2x^2 - x + 3)^2} + \frac{119}{21296} \ln(5x^2 + 3x + 2) - \frac{119}{21296} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3),x, algorithm="giac")

[Out] $247/330088 \sqrt{31} \operatorname{arctan}(1/31 \sqrt{31} (10x + 3)) + 53403/129554216 \sqrt{23} \operatorname{arctan}(1/23 \sqrt{23} (4x - 1)) - 1/256036 (1492x^3 - 7996x^2 + 7381x - 14164)/(2x^2 - x + 3)^2 + 119/21296 \ln(5x^2 + 3x + 2) - 119/21296 \ln(2x^2 - x + 3)$

$$3.56 \quad \int \frac{1}{(3-x+2x^2)^3(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=160

$$\begin{aligned} & \frac{9665 - 1446x}{512072(2x^2 - x + 3)(5x^2 + 3x + 2)} - \frac{252815x + 2328909}{174616552(5x^2 + 3x + 2)} + \frac{13 - 6x}{1012(2x^2 - x + 3)^2(5x^2 + 3x + 2)} \\ & + \frac{181 \log(2x^2 - x + 3)}{468512} - \frac{181 \log(5x^2 + 3x + 2)}{468512} + \frac{2038497 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{123921424\sqrt{23}} + \frac{246757 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{7261936\sqrt{31}} \end{aligned}$$

[Out] $-(2328909 + 252815*x)/(174616552*(2 + 3*x + 5*x^2)) + (13 - 6*x)/(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)) + (9665 - 1446*x)/(512072*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)) + (2038497*ArcTan[(1 - 4*x)/Sqrt[23]])/(123921424*Sqrt[23]) + (246757*ArcTan[(3 + 10*x)/Sqrt[31]])/(7261936*Sqrt[31]) + (181*Log[3 - x + 2*x^2])/468512 - (181*Log[2 + 3*x + 5*x^2])/468512$

Rubi [A] time = 0.36646, antiderivative size = 160, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\begin{aligned} & \frac{9665 - 1446x}{512072(2x^2 - x + 3)(5x^2 + 3x + 2)} - \frac{252815x + 2328909}{174616552(5x^2 + 3x + 2)} + \frac{13 - 6x}{1012(2x^2 - x + 3)^2(5x^2 + 3x + 2)} \\ & + \frac{181 \log(2x^2 - x + 3)}{468512} - \frac{181 \log(5x^2 + 3x + 2)}{468512} + \frac{2038497 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{123921424\sqrt{23}} + \frac{246757 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{7261936\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2), x]

[Out] $-(2328909 + 252815*x)/(174616552*(2 + 3*x + 5*x^2)) + (13 - 6*x)/(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)) + (9665 - 1446*x)/(512072*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)) + (2038497*ArcTan[(1 - 4*x)/Sqrt[23]])/(123921424*Sqrt[23]) + (246757*ArcTan[(3 + 10*x)/Sqrt[31]])/(7261936*Sqrt[31]) + (181*Log[3 - x + 2*x^2])/468512 - (181*Log[2 + 3*x + 5*x^2])/468512$

Rubi in Sympy [A] time = 101.504, size = 134, normalized size = 0.84

$$\begin{aligned} & -\frac{-715594x + 1179387}{83512264(2x^2 - x + 3)^2} + \frac{715x + 44}{7502(2x^2 - x + 3)^2(5x^2 + 3x + 2)} \\ & - \frac{269197412x + 2183705150}{464829261424(2x^2 - x + 3)} + \frac{181 \log(2x^2 - x + 3)}{468512} - \frac{181 \log(5x^2 + 3x + 2)}{468512} \\ & - \frac{2038497\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{2850192752} + \frac{246757\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{225120016} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)`

[Out] `-(-715594*x + 1179387)/(83512264*(2*x**2 - x + 3)**2) + (715*x + 44)/(7502*(2*x**2 - x + 3)**2*(5*x**2 + 3*x + 2)) - (269197412*x + 2183705150)/(464829261424*(2*x**2 - x + 3)) + 181*log(2*x**2 - x + 3)/468512 - 181*log(5*x**2 + 3*x + 2)/468512 - 2038497*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/2850192752 + 246757*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/225120016`

Mathematica [A] time = 0.204017, size = 136, normalized size = 0.85

$$\begin{aligned} & \frac{-2923x - 1782}{1408198(2x^2 - x + 3)} + \frac{1235x - 1474}{330088(5x^2 + 3x + 2)} + \frac{-14x - 31}{22264(2x^2 - x + 3)^2} + \frac{181 \log(2x^2 - x + 3)}{468512} \\ & - \frac{181 \log(5x^2 + 3x + 2)}{468512} - \frac{2038497 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{123921424\sqrt{23}} + \frac{246757 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{7261936\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] `Integrate[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2),x]`

[Out] `(-31 - 14*x)/(22264*(3 - x + 2*x^2)^2) + (-1782 - 2923*x)/(1408198*(3 - x + 2*x^2)) + (-1474 + 1235*x)/(330088*(2 + 3*x + 5*x^2)) - (2038497*ArcTan[(-1 + 4*x)/Sqrt[23]])/(123921424*Sqrt[23]) + (246757*ArcTan[(3 + 10*x)/Sqrt[31]])/(7261936*Sqrt[31]) + (181*Log[3 - x + 2*x^2])/468512 - (181*Log[2 + 3*x + 5*x^2])/468512`

Maple [A] time = 0.013, size = 106, normalized size = 0.7

$$\begin{aligned}
 & -\frac{1}{234256} \left(-\frac{5434x}{31} + \frac{32428}{155} \right) \left(x^2 + \frac{3x}{5} + \frac{2}{5} \right)^{-1} \\
 & - \frac{181 \ln(25x^2 + 15x + 10)}{468512} + \frac{246757\sqrt{31}}{225120016} \arctan\left(\frac{(50x + 15)\sqrt{31}}{155}\right) \\
 & + \frac{1}{58564(2x^2 - x + 3)^2} \left(-\frac{128612x^3}{529} - \frac{14102x^2}{529} - \frac{173195x}{529} - \frac{321497}{1058} \right) \\
 & + \frac{181 \ln(8x^2 - 4x + 12)}{468512} - \frac{2038497\sqrt{23}}{2850192752} \arctan\left(\frac{(16x - 4)\sqrt{23}}{92}\right)
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^3/(5*x^2+3*x+2)^2,x)`

[Out] `-1/234256*(-5434/31*x+32428/155)/(x^2+3/5*x+2/5)-181/468512*ln(25*x^2+15*x+10)+246757/225120016*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))+1/58564*(-128612/529*x^3-14102/529*x^2-173195/529*x-321497/1058)/(2*x^2-x+3)^2+181/468512*ln(8*x^2-4*x+12)-2038497/2850192752*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))`

Maxima [A] time = 0.764744, size = 157, normalized size = 0.98

$$\begin{aligned}
 & \frac{246757}{225120016} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x + 3)\right) - \frac{2038497}{2850192752} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) \\
 & - \frac{1011260x^5 + 8304376x^4 - 5042869x^3 + 21674311x^2 - 5887820x + 8829788}{174616552(20x^6 - 8x^5 + 61x^4 + x^3 + 53x^2 + 15x + 18)} \\
 & - \frac{181}{468512} \log(5x^2 + 3x + 2) + \frac{181}{468512} \log(2x^2 - x + 3)
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3),x, algorithm="maxima")`

[Out] `246757/225120016*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2038497/2850192752*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/174616552*(1011260*x^5 + 8304376*x^4 - 5042869*x^3 + 21674311*x^2 - 5887820*x + 8829788)/(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18) - 181/468512*log(5*x^2 + 3*x + 2) + 181/468512*log(2*x^2 - x + 3)`

Fricas [A] time = 0.272332, size = 343, normalized size = 2.14

$$\frac{\sqrt{31}\sqrt{23}\left(2968219\sqrt{31}\sqrt{23}(20x^6 - 8x^5 + 61x^4 + x^3 + 53x^2 + 15x + 18)\log(5x^2 + 3x + 2) - 2968219\sqrt{31}\sqrt{23}(20x^6 - \right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3),x, algorithm="fricas")

[Out] -1/5478070469344*sqrt(31)*sqrt(23)*(2968219*sqrt(31)*sqrt(23)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*log(5*x^2 + 3*x + 2) - 2968219*sqrt(31)*sqrt(23)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*log(2*x^2 - x + 3) - 261068906*sqrt(23)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*arctan(1/31*sqrt(31)*(10*x + 3)) + 126386814*sqrt(31)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*arctan(1/23*sqrt(23)*(4*x - 1)) + 44*sqrt(31)*sqrt(23)*(1011260*x^5 + 8304376*x^4 - 5042869*x^3 + 21674311*x^2 - 5887820*x + 8829788))/(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)

Sympy [A] time = 0.595515, size = 143, normalized size = 0.89

$$\frac{1011260x^5 + 8304376x^4 - 5042869x^3 + 21674311x^2 - 5887820x + 8829788}{3492331040x^6 - 1396932416x^5 + 10651609672x^4 + 174616552x^3 + 9254677256x^2 + 2619248280x + 3143097936} + \frac{181\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{468512} - \frac{181\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{468512} - \frac{2038497\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{2850192752} + \frac{246757\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{225120016}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)

[Out] -(1011260*x**5 + 8304376*x**4 - 5042869*x**3 + 21674311*x**2 - 5887820*x + 8829788)/(3492331040*x**6 - 1396932416*x**5 + 10651609672*x**4 + 174616552*x**3 + 9254677256*x**2 + 2619248280*x + 3143097936) + 181*log(x**2 - x/2 + 3/2)/468512 - 181*log(x**2 + 3*x/5 + 2/5)/468512 - 2038497*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/2850192752 + 246757*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/225120016

GIAC/XCAS [A] time = 0.267255, size = 149, normalized size = 0.93

$$\begin{aligned} & \frac{246757}{225120016} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) - \frac{2038497}{2850192752} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) \\ & - \frac{1011260x^5 + 8304376x^4 - 5042869x^3 + 21674311x^2 - 5887820x + 8829788}{174616552(5x^2 + 3x + 2)(2x^2 - x + 3)^2} \\ & - \frac{181}{468512} \ln(5x^2 + 3x + 2) + \frac{181}{468512} \ln(2x^2 - x + 3) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3),x, algorithm="giac")

[Out] 246757/225120016*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2038497/2850192752*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/174616552*(1011260*x^5 + 8304376*x^4 - 5042869*x^3 + 21674311*x^2 - 5887820*x + 8829788)/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2) - 181/468512*ln(5*x^2 + 3*x + 2) + 181/468512*ln(2*x^2 - x + 3)

$$3.57 \quad \int \frac{1}{(3-x+2x^2)^3(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=181

$$\begin{aligned} & \frac{5(302-35x)}{64009(2x^2-x+3)(5x^2+3x+2)^2} + \frac{15(7140435x+2618306)}{14886061058(5x^2+3x+2)} \\ & - \frac{5(77020x+223707)}{87308276(5x^2+3x+2)^2} + \frac{13-6x}{1012(2x^2-x+3)^2(5x^2+3x+2)^2} + \frac{405 \log(2x^2-x+3)}{1288408} \\ & - \frac{405 \log(5x^2+3x+2)}{1288408} - \frac{880575 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{340783916\sqrt{23}} + \frac{2768835 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{619080044\sqrt{31}} \end{aligned}$$

[Out] $(-5*(223707 + 77020*x))/(87308276*(2 + 3*x + 5*x^2)^2) + (13 - 6*x)/(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2) + (5*(302 - 35*x))/(64009*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (15*(2618306 + 7140435*x))/(14886061058*(2 + 3*x + 5*x^2)) - (880575*ArcTan[(1 - 4*x)/Sqrt[23]])/(340783916*Sqrt[23]) + (2768835*ArcTan[(3 + 10*x)/Sqrt[31]])/(619080044*Sqrt[31]) + (405*Log[3 - x + 2*x^2])/1288408 - (405*Log[2 + 3*x + 5*x^2])/1288408$

Rubi [A] time = 0.454219, antiderivative size = 181, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\begin{aligned} & \frac{5(302-35x)}{64009(2x^2-x+3)(5x^2+3x+2)^2} + \frac{15(7140435x+2618306)}{14886061058(5x^2+3x+2)} \\ & - \frac{5(77020x+223707)}{87308276(5x^2+3x+2)^2} + \frac{13-6x}{1012(2x^2-x+3)^2(5x^2+3x+2)^2} + \frac{405 \log(2x^2-x+3)}{1288408} \\ & - \frac{405 \log(5x^2+3x+2)}{1288408} - \frac{880575 \tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{340783916\sqrt{23}} + \frac{2768835 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{619080044\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3), x]

[Out] $(-5*(223707 + 77020*x))/(87308276*(2 + 3*x + 5*x^2)^2) + (13 - 6*x)/(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2) + (5*(302 - 35*x))/(64009*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (15*(2618306 + 7140435*x))/(14886061058*(2 + 3*x + 5*x^2)) - (880575*ArcTan[(1 - 4*x)/Sqrt[23]])/(340783916*Sqrt[23]) + (2768835*ArcTan[(3 + 10*x)/Sqrt[31]])/(619080044*Sqrt[31]) + (405*Log[3 - x + 2*x^2])/1288408 - (405*Log[2 + 3*x + 5*x^2])/1288408$

Rubi in Sympy [A] time = 126.545, size = 172, normalized size = 0.95

$$\begin{aligned} & \frac{-663080x + 1295668}{167024528(2x^2 - x + 3)^2(5x^2 + 3x + 2)} + \frac{715x + 44}{15004(2x^2 - x + 3)^2(5x^2 + 3x + 2)^2} \\ & - \frac{1640217920x + 2959824560}{929658522848(2x^2 - x + 3)(5x^2 + 3x + 2)} + \frac{50180692240800x + 18400616710080}{6974298238405696(5x^2 + 3x + 2)} \\ & + \frac{405 \log(2x^2 - x + 3)}{1288408} - \frac{405 \log(5x^2 + 3x + 2)}{1288408} \\ & + \frac{880575\sqrt{23} \operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23} - \frac{1}{23}\right)\right)}{7838030068} + \frac{2768835\sqrt{31} \operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31} + \frac{3}{31}\right)\right)}{19191481364} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)`

[Out]
$$\begin{aligned} & -(-663080x + 1295668)/(167024528(2x^2 - x + 3)^2(5x^2 + 3x + 2)) + (715x + 44)/(15004(2x^2 - x + 3)^2(5x^2 + 3x + 2)^2) \\ & - (1640217920x + 2959824560)/(929658522848(2x^2 - x + 3)(5x^2 + 3x + 2)) + (50180692240800x + 18400616710080)/(6974298238405696(5x^2 + 3x + 2)) \\ & + 405 \log(2x^2 - x + 3)/1288408 - 405 \log(5x^2 + 3x + 2)/1288408 + 880575 \sqrt{23} \operatorname{atan}(\sqrt{23}(4x/23 - 1/23))/7838030068 \\ & + 2768835 \sqrt{31} \operatorname{atan}(\sqrt{31}(10x/31 + 3/31))/19191481364 \end{aligned}$$

Mathematica [A] time = 0.164006, size = 151, normalized size = 0.83

$$\begin{aligned} & \frac{405 \log(2x^2 - x + 3)}{1288408} - \frac{405 \log(5x^2 + 3x + 2)}{1288408} + \frac{6850x^3 - 9275x^2 + 11154x - 4342}{345092(10x^4 + x^3 + 16x^2 + 7x + 6)^2} \\ & + \frac{5(42842610x^3 - 5711469x^2 + 51156233x + 14085977)}{14886061058(10x^4 + x^3 + 16x^2 + 7x + 6)} \\ & + \frac{880575 \tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{340783916\sqrt{23}} + \frac{2768835 \tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{619080044\sqrt{31}} \end{aligned}$$

Antiderivative was successfully verified.

[In] `Integrate[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3),x]`

[Out]
$$\begin{aligned} & (-4342 + 11154x - 9275x^2 + 6850x^3)/(345092(6 + 7x + 16x^2 + x^3 + 10x^4)^2) + (5(14085977 + 51156233x - 5711469x^2 + 42842610x^3))/(14886061058(6 + 7x + 16x^2 + x^3 + 10x^4)) \\ & + (880575 \operatorname{ArcTan}[-1 + 4x]/\operatorname{Sqrt}[23])/(340783916 \operatorname{Sqrt}[23]) + (2768835 \operatorname{ArcTan}[(3 + 10x)/\operatorname{Sqrt}[31]])/(619080044 \operatorname{Sqrt}[31]) \\ & + (405 \operatorname{Log}[3 - x + 2x^2])/1288408 - (405 \operatorname{Log}[2 + 3x + 5x^2])/1288408 \end{aligned}$$

Maple [A] time = 0.014, size = 118, normalized size = 0.7

$$\begin{aligned}
 & -\frac{25}{2576816(5x^2+3x+2)^2} \left(-\frac{3013197x^3}{961} - \frac{14516062x^2}{4805} - \frac{51193868x}{24025} - \frac{5423968}{24025} \right) \\
 & - \frac{405 \ln(125x^2+75x+50)}{1288408} + \frac{2768835\sqrt{31}}{19191481364} \arctan\left(\frac{(250x+75)\sqrt{31}}{775}\right) \\
 & + \frac{1}{644204(2x^2-x+3)^2} \left(\frac{302907x^3}{529} - \frac{368291x^2}{529} + \frac{2501587x}{2116} - \frac{665819}{1058} \right) \\
 & + \frac{405 \ln(8x^2-4x+12)}{1288408} + \frac{880575\sqrt{23}}{7838030068} \arctan\left(\frac{(16x-4)\sqrt{23}}{92}\right)
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^3/(5*x^2+3*x+2)^3,x)`

[Out] `-25/2576816*(-3013197/961*x^3-14516062/4805*x^2-51193868/24025*x-5423968/24025)/(5*x^2+3*x+2)^2-405/1288408*ln(125*x^2+75*x+50)+2768835/19191481364*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))+1/644204*(302907/529*x^3-368291/529*x^2+2501587/2116*x-665819/1058)/(2*x^2-x+3)^2+405/1288408*ln(8*x^2-4*x+12)+880575/7838030068*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))`

Maxima [A] time = 0.768326, size = 186, normalized size = 1.03

$$\begin{aligned}
 & \frac{2768835}{19191481364} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) + \frac{880575}{7838030068} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) \\
 & + \frac{4284261000x^7 - 142720800x^6 + 11913326210x^5 + 4005307690x^4 + 11087580870x^3 + 4691822415x^2 + 5017681412x + 470561254}{29772122116(100x^8 + 20x^7 + 321x^6 + 172x^5 + 390x^4 + 236x^3 + 241x^2 + 84x + 36)} \\
 & - \frac{405}{1288408} \log(5x^2+3x+2) + \frac{405}{1288408} \log(2x^2-x+3)
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2+3*x+2)^3*(2*x^2-x+3)^3),x,algorithm="maxima")`

[Out] `2768835/19191481364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x+3))+880575/7838030068*sqrt(23)*arctan(1/23*sqrt(23)*(4*x-1))+1/29772122116*(4284261000*x^7-142720800*x^6+11913326210*x^5+4005307690*x^4+11087580870*x^3+4691822415*x^2+5017681412*x+470561254)/(100*x^8+20*x^7+321*x^6+172*x^5+390*x^4+236*x^3+241*x^2+84*x+36)-405/1288408*log(5*x^2+3*x+2)+405/1288408*log(2*x^2-x+3)`

Fricas [A] time = 0.279969, size = 437, normalized size = 2.41

$$\frac{\sqrt{31}\sqrt{23}\left(205889445\sqrt{31}\sqrt{23}\left(100x^8 + 20x^7 + 321x^6 + 172x^5 + 390x^4 + 236x^3 + 241x^2 + 84x + 36\right)\log\left(5x^2 + 3x + 2\right)\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3),x, algorithm="fricas")

[Out]
$$\begin{aligned} & -1/467005507511576*\sqrt{31}*\sqrt{23}*(205889445*\sqrt{31}*\sqrt{23}) \\ & *(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36)*\log(5*x^2 + 3*x + 2) - 205889445*\sqrt{31}*\sqrt{23} \\ & *(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36)*\log(2*x^2 - x + 3) - 2929427430*\sqrt{23}*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36)*\arctan(1/31*\sqrt{31}*(10*x + 3)) - 1692465150*\sqrt{31} \\ & *(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36)*\arctan(1/23*\sqrt{23}*(4*x - 1)) - 22*\sqrt{31}*\sqrt{23} \\ & *(4284261000*x^7 - 142720800*x^6 + 11913326210*x^5 + 4005307690*x^4 + 11087580870*x^3 + 4691822415*x^2 + 5017681412*x + 470561254)/(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36) \end{aligned}$$

Sympy [A] time = 0.69941, size = 163, normalized size = 0.9

$$\begin{aligned} & \frac{4284261000x^7 - 142720800x^6 + 11913326210x^5 + 4005307690x^4 + 11087580870x^3 + 4691822415x^2 + 5017681412x + 470561254}{2977212211600x^8 + 595442442320x^7 + 9556851199236x^6 + 5120805003952x^5 + 11611127625240x^4 + 7026220819376x^3 + 7175081429956x^2 + 2500858257744x + 1071796396176} + \frac{405\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{1288408} - \frac{405\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{1288408} \\ & + \frac{880575\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{7838030068} + \frac{2768835\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{19191481364} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)

[Out]
$$\begin{aligned} & (4284261000*x**7 - 142720800*x**6 + 11913326210*x**5 + 4005307690*x**4 + 11087580870*x**3 + 4691822415*x**2 + 5017681412*x + 470561254)/(2977212211600*x**8 + 595442442320*x**7 + 9556851199236*x**6 + 5120805003952*x**5 + 11611127625240*x**4 + 7026220819376*x**3 + 7175081429956*x**2 + 2500858257744*x + 1071796396176) + 405*\log(x**2 - x/2 + 3/2)/1288408 - 405*\log(x**2 + 3*x/5 + 2/5)/1288408 \\ & + 880575*\sqrt{23}*\operatorname{atan}(4*\sqrt{23}*x/23 - \sqrt{23}/23)/7838030068 \end{aligned}$$

+ 2768835*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/19191481364

GIAC/XCAS [A] time = 0.267992, size = 157, normalized size = 0.87

$$\frac{2768835}{19191481364} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10x+3)\right) + \frac{880575}{7838030068} \sqrt{23} \arctan\left(\frac{1}{23} \sqrt{23}(4x-1)\right) + \frac{4284261000x^7 - 142720800x^6 + 11913326210x^5 + 4005307690x^4 + 11087580870x^3 + 4691822415x^2 + 5017681412x + 470561254}{29772122116(10x^4 + x^3 + 16x^2 + 7x + 6)^2} - \frac{405}{1288408} \ln(5x^2 + 3x + 2) + \frac{405}{1288408} \ln(2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3),x, algorithm="giac")

[Out] 2768835/19191481364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 880575/7838030068*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/29772122116*(4284261000*x^7 - 142720800*x^6 + 11913326210*x^5 + 4005307690*x^4 + 11087580870*x^3 + 4691822415*x^2 + 5017681412*x + 470561254)/(10*x^4 + x^3 + 16*x^2 + 7*x + 6)^2 - 405/1288408*ln(5*x^2 + 3*x + 2) + 405/1288408*ln(2*x^2 - x + 3)

$$3.58 \quad \int \sqrt{3 - x + 2x^2} (2 + 3x + 5x^2)^4 dx$$

Optimal. Leaf size=208

$$\begin{aligned} & -\frac{83948353 (2x^2 - x + 3)^{3/2} x^2}{2293760} + \frac{804243809 (2x^2 - x + 3)^{3/2} x}{36700160} \\ & + \frac{27185733541 (2x^2 - x + 3)^{3/2}}{440401920} - \frac{359471503(1 - 4x)\sqrt{2x^2 - x + 3}}{67108864} \\ & + \frac{125}{4} (2x^2 - x + 3)^{3/2} x^7 + \frac{14125}{144} (2x^2 - x + 3)^{3/2} x^6 + \frac{233225 (2x^2 - x + 3)^{3/2} x^5}{1536} + \frac{4796405 (2x^2 - x + 3)^{3/2} x^4}{43008} + \frac{8325631 (2x^2 - x + 3)^{3/2} x^3}{1032192} \end{aligned}$$

[Out] $(-359471503*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/67108864 + (27185733541*(3 - x + 2*x^2)^{(3/2)})/440401920 + (804243809*x*(3 - x + 2*x^2)^{(3/2)})/36700160 - (83948353*x^2*(3 - x + 2*x^2)^{(3/2)})/2293760 + (8325631*x^3*(3 - x + 2*x^2)^{(3/2)})/1032192 + (4796405*x^4*(3 - x + 2*x^2)^{(3/2)})/43008 + (233225*x^5*(3 - x + 2*x^2)^{(3/2)})/1536 + (14125*x^6*(3 - x + 2*x^2)^{(3/2)})/144 + (125*x^7*(3 - x + 2*x^2)^{(3/2)})/4 - (8267844569*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(134217728*\text{Sqrt}[2])$

Rubi [A] time = 0.483532, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & -\frac{83948353 (2x^2 - x + 3)^{3/2} x^2}{2293760} + \frac{804243809 (2x^2 - x + 3)^{3/2} x}{36700160} \\ & + \frac{27185733541 (2x^2 - x + 3)^{3/2}}{440401920} - \frac{359471503(1 - 4x)\sqrt{2x^2 - x + 3}}{67108864} \\ & + \frac{125}{4} (2x^2 - x + 3)^{3/2} x^7 + \frac{14125}{144} (2x^2 - x + 3)^{3/2} x^6 + \frac{233225 (2x^2 - x + 3)^{3/2} x^5}{1536} + \frac{4796405 (2x^2 - x + 3)^{3/2} x^4}{43008} + \frac{8325631 (2x^2 - x + 3)^{3/2} x^3}{1032192} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[\text{Sqrt}[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^4, x]$

[Out] $(-359471503*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/67108864 + (27185733541*(3 - x + 2*x^2)^{(3/2)})/440401920 + (804243809*x*(3 - x + 2*x^2)^{(3/2)})/36700160 - (83948353*x^2*(3 - x + 2*x^2)^{(3/2)})/2293760 + (8325631*x^3*(3 - x + 2*x^2)^{(3/2)})/1032192 + (4796405*x^4*(3 - x + 2*x^2)^{(3/2)})/43008 + (233225*x^5*(3 - x + 2*x^2)^{(3/2)})/1536 + (14125*x^6*(3 - x + 2*x^2)^{(3/2)})/144 + (125*x^7*(3 - x + 2*x^2)^{(3/2)})/4 - (8267844569*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(134217728*\text{Sqrt}[2])$

Rubi in Sympy [A] time = 102.482, size = 192, normalized size = 0.92

$$\begin{aligned}
& - \frac{\left(-\frac{3847264125x}{8} + \frac{6356151165}{32}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2}{604800000} \\
& - \frac{\left(-\frac{170205x}{2} + \frac{6162015}{8}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^3}{1008000} \\
& + \frac{(90x + \frac{241}{2}) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^3}{360} \\
& + \frac{\left(\frac{31895887634775x}{32} + \frac{185297635332855}{128}\right) \left(-\frac{2126392508985x^2}{64} - \frac{440352854355x}{64} + \frac{122592566805}{32}\right) \sqrt{2x^2 - x + 3}}{964531642075596000000} \\
& + \frac{\left(\frac{1259687335261370714967506625x}{8192} + \frac{43862534956680368824216701675}{32768}\right) \sqrt{2x^2 - x + 3}}{7716253136604768000000} \\
& + \frac{8267844569\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{268435456}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4*(2*x**2-x+3)**(1/2),x)`

[Out] `-(-3847264125*x/8 + 6356151165/32)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2/604800000 - (-170205*x/2 + 6162015/8)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3/1008000 + (90*x + 241/2)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**3/360 + (31895887634775*x/32 + 185297635332855/128)*(-2126392508985*x**2/64 - 440352854355*x/64 + 122592566805/32)*sqrt(2*x**2 - x + 3)/964531642075596000000 + (1259687335261370714967506625*x/8192 + 43862534956680368824216701675/32768)*sqrt(2*x**2 - x + 3)/7716253136604768000000 + 8267844569*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/268435456`

Mathematica [A] time = 0.112816, size = 85, normalized size = 0.41

$$4\sqrt{2x^2 - x + 3} (1321205760000x^9 + 3486515200000x^8 + 6327795712000x^7 + 7725962035200x^6 + 7612808028160x^5 + 5354741991424x^4 + 7612808028160x^3 + 5354741991424x^2 + 2211683657856x + 268435456)$$

84557

Antiderivative was successfully verified.

[In] `Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^4,x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(3801512106459 + 537752185764*x - 174418077792*x^2 + 2211683657856*x^3 + 5354741991424*x^4 + 7612808028160*x^5 + 5354741991424*x^6 + 7612808028160*x^7 + 3486515200000*x^8 + 1321205760000*x^9))`

$$x^5 + 7725962035200x^6 + 6327795712000x^7 + 3486515200000x^8 + 1321205760000x^9) + 2604371039235\sqrt{2}\operatorname{ArcSinh}\left(\frac{-1 + 4x}{\sqrt{23}}\right)/84557168640$$

Maple [A] time = 0.039, size = 166, normalized size = 0.8

$$\begin{aligned} & \frac{1437886012x - 359471503}{67108864} \sqrt{2x^2 - x + 3} + \frac{8267844569\sqrt{2}}{268435456} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) \\ & + \frac{27185733541}{440401920} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{804243809x}{36700160} (2x^2 - x + 3)^{\frac{3}{2}} \\ & - \frac{83948353x^2}{2293760} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{8325631x^3}{1032192} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{4796405x^4}{43008} (2x^2 - x + 3)^{\frac{3}{2}} \\ & + \frac{233225x^5}{1536} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{14125x^6}{144} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{125x^7}{4} (2x^2 - x + 3)^{\frac{3}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4*(2*x^2-x+3)^(1/2),x)`

[Out] $359471503/67108864*(4*x-1)*(2*x^2-x+3)^(1/2)+8267844569/268435456*2^(1/2)*\operatorname{arcsinh}(4/23*23^(1/2)*(x-1/4))+27185733541/440401920*(2*x^2-x+3)^(3/2)+804243809/36700160*x*(2*x^2-x+3)^(3/2)-83948353/2293760*x^2*(2*x^2-x+3)^(3/2)+8325631/1032192*x^3*(2*x^2-x+3)^(3/2)+4796405/43008*x^4*(2*x^2-x+3)^(3/2)+233225/1536*x^5*(2*x^2-x+3)^(3/2)+14125/144*x^6*(2*x^2-x+3)^(3/2)+125/4*x^7*(2*x^2-x+3)^(3/2)$

Maxima [A] time = 0.795224, size = 239, normalized size = 1.15

$$\begin{aligned} & \frac{125}{4} (2x^2 - x + 3)^{\frac{3}{2}} x^7 + \frac{14125}{144} (2x^2 - x + 3)^{\frac{3}{2}} x^6 + \frac{233225}{1536} (2x^2 - x + 3)^{\frac{3}{2}} x^5 \\ & + \frac{4796405}{43008} (2x^2 - x + 3)^{\frac{3}{2}} x^4 + \frac{8325631}{1032192} (2x^2 - x + 3)^{\frac{3}{2}} x^3 - \frac{83948353}{2293760} (2x^2 - x + 3)^{\frac{3}{2}} x^2 \\ & + \frac{804243809}{36700160} (2x^2 - x + 3)^{\frac{3}{2}} x + \frac{27185733541}{440401920} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{359471503}{16777216} \sqrt{2x^2 - x + 3x} \\ & + \frac{8267844569}{268435456} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{359471503}{67108864} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4*sqrt(2*x^2 - x + 3),x, algorithm="maxima")`

[Out] $125/4*(2*x^2 - x + 3)^(3/2)*x^7 + 14125/144*(2*x^2 - x + 3)^(3/2)*x^6 + 233225/1536*(2*x^2 - x + 3)^(3/2)*x^5 + 4796405/43008*(2*x$

$$\begin{aligned} &^2 - x + 3)^{(3/2)} * x^4 + 8325631/1032192 * (2 * x^2 - x + 3)^{(3/2)} * x^3 \\ &- 83948353/2293760 * (2 * x^2 - x + 3)^{(3/2)} * x^2 + 804243809/3670016 \\ &0 * (2 * x^2 - x + 3)^{(3/2)} * x + 27185733541/440401920 * (2 * x^2 - x + 3) \\ &^{(3/2)} + 359471503/16777216 * \text{sqrt}(2 * x^2 - x + 3) * x + 8267844569/26 \\ &8435456 * \text{sqrt}(2) * \text{arcsinh}(1/23 * \text{sqrt}(23) * (4 * x - 1)) - 359471503/6710 \\ &8864 * \text{sqrt}(2 * x^2 - x + 3) \end{aligned}$$

Fricas [A] time = 0.283938, size = 143, normalized size = 0.69

$$\frac{1}{169114337280} \sqrt{2} \left(4 \sqrt{2} (1321205760000 x^9 + 3486515200000 x^8 + 6327795712000 x^7 + 7725962035200 x^6 + 76128080281600 x^5 + 5354741991424 x^4 + 2211683657856 x^3 - 174418077792 x^2 + 537752185764 x + 3801512106459) * \text{sqrt}(2 * x^2 - x + 3) + 2604371039235 * \log(-\text{sqrt}(2) * (32 * x^2 - 16 * x + 25) - 8 * \text{sqrt}(2 * x^2 - x + 3) * (4 * x - 1)) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*sqrt(2*x^2 - x + 3),x, algorithm="fricas")

[Out] 1/169114337280*sqrt(2)*(4*sqrt(2)*(1321205760000*x^9 + 3486515200000*x^8 + 6327795712000*x^7 + 7725962035200*x^6 + 7612808028160*x^5 + 5354741991424*x^4 + 2211683657856*x^3 - 174418077792*x^2 + 537752185764*x + 3801512106459)*sqrt(2*x^2 - x + 3) + 2604371039235*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))

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

$$\int \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^4 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**4*(2*x**2-x+3)**(1/2),x)

[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**4, x)

GIAC/XCAS [A] time = 0.270402, size = 126, normalized size = 0.61

$$\begin{aligned} &\frac{1}{21139292160} (4(8(4(16(20(40(140(160(36x + 95)x + 27587)x + 4715553)x + 185859571)x + 2614620113)x + 1727877857 \\ &- \frac{8267844569}{268435456} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4*sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/21139292160*(4*(8*(4*(16*(20*(40*(140*(160*(36*x + 95)*x + 2758
7)*x + 4715553)*x + 185859571)*x + 2614620113)*x + 17278778577)*x
- 5450564931)*x + 134438046441)*x + 3801512106459)*sqrt(2*x^2 -
x + 3) - 8267844569/268435456*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x -
sqrt(2*x^2 - x + 3)) + 1)
```

$$3.59 \quad \int \sqrt{3 - x + 2x^2} (2 + 3x + 5x^2)^3 dx$$

Optimal. Leaf size=166

$$\frac{531681 (2x^2 - x + 3)^{3/2} x^2}{71680} - \frac{9627393 (2x^2 - x + 3)^{3/2} x}{1146880} - \frac{22548119 (2x^2 - x + 3)^{3/2}}{4587520} - \frac{6766097(1 - 4x)\sqrt{2x^2 - x + 3}}{2097152} + \frac{125}{16} (2x^2 - x + 3)^{3/2} x^5 + \frac{8825}{448} (2x^2 - x + 3)^{3/2} x^4 + \frac{247435 (2x^2 - x + 3)^{3/2} x^3}{10752} - \frac{155620231 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4194304\sqrt{2}}$$

[Out] (-6766097*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/2097152 - (22548119*(3 - x + 2*x^2)^(3/2))/4587520 - (9627393*x*(3 - x + 2*x^2)^(3/2))/1146880 + (531681*x^2*(3 - x + 2*x^2)^(3/2))/71680 + (247435*x^3*(3 - x + 2*x^2)^(3/2))/10752 + (8825*x^4*(3 - x + 2*x^2)^(3/2))/448 + (125*x^5*(3 - x + 2*x^2)^(3/2))/16 - (155620231*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4194304*Sqrt[2])

Rubi [A] time = 0.311495, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{531681 (2x^2 - x + 3)^{3/2} x^2}{71680} - \frac{9627393 (2x^2 - x + 3)^{3/2} x}{1146880} - \frac{22548119 (2x^2 - x + 3)^{3/2}}{4587520} - \frac{6766097(1 - 4x)\sqrt{2x^2 - x + 3}}{2097152} + \frac{125}{16} (2x^2 - x + 3)^{3/2} x^5 + \frac{8825}{448} (2x^2 - x + 3)^{3/2} x^4 + \frac{247435 (2x^2 - x + 3)^{3/2} x^3}{10752} - \frac{155620231 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4194304\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3,x]

[Out] (-6766097*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/2097152 - (22548119*(3 - x + 2*x^2)^(3/2))/4587520 - (9627393*x*(3 - x + 2*x^2)^(3/2))/1146880 + (531681*x^2*(3 - x + 2*x^2)^(3/2))/71680 + (247435*x^3*(3 - x + 2*x^2)^(3/2))/10752 + (8825*x^4*(3 - x + 2*x^2)^(3/2))/448 + (125*x^5*(3 - x + 2*x^2)^(3/2))/16 - (155620231*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4194304*Sqrt[2])

Rubi in Sympy [A] time = 68.4031, size = 153, normalized size = 0.92

$$\frac{\left(-\frac{836463255x}{8} + \frac{1760991321}{32}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)}{80640000} - \frac{\left(-\frac{83975x}{2} + \frac{2357587}{8}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2}{336000} + \frac{\left(70x + \frac{185}{2}\right) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^2}{224} - \frac{\left(\frac{306519103821x}{32} + \frac{1490800160271}{128}\right) \sqrt{2x^2 - x + 3}}{645120000} + \frac{155620231\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8388608}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**3*(2*x**2-x+3)**(1/2),x)`

[Out] `-(-836463255*x/8 + 1760991321/32)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/80640000 - (-83975*x/2 + 2357587/8)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2/336000 + (70*x + 185/2)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2/224 - (306519103821*x/32 + 1490800160271/128)*sqrt(2*x**2 - x + 3)/645120000 + 155620231*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/8388608`

Mathematica [A] time = 0.0900378, size = 75, normalized size = 0.45

$$\frac{4\sqrt{2x^2 - x + 3} (3440640000x^7 + 6955008000x^6 + 10958233600x^5 + 11212171264x^4 + 9872163456x^3 + 4583812128x^2 - 162880803840)}{880803840}$$

Antiderivative was successfully verified.

[In] `Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3,x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(-3957369321 - 1621307916*x + 4583812128*x^2 + 9872163456*x^3 + 11212171264*x^4 + 10958233600*x^5 + 6955008000*x^6 + 3440640000*x^7) + 16340124255*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/880803840`

Maple [A] time = 0.01, size = 132, normalized size = 0.8

$$\frac{27064388x - 6766097}{2097152} \sqrt{2x^2 - x + 3} + \frac{155620231\sqrt{2}}{8388608} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) - \frac{22548119}{4587520} (2x^2 - x + 3)^{\frac{3}{2}} - \frac{9627393x}{1146880} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{531681x^2}{71680} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{247435x^3}{10752} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{8825x^4}{448} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{125x^5}{16} (2x^2 - x + 3)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^3*(2*x^2-x+3)^(1/2),x)`

[Out] $6766097/2097152*(4*x-1)*(2*x^2-x+3)^(1/2)+155620231/8388608*2^(1/2)*\operatorname{arcsinh}(4/23*23^(1/2)*(x-1/4))-22548119/4587520*(2*x^2-x+3)^(3/2)-9627393/1146880*x*(2*x^2-x+3)^(3/2)+531681/71680*x^2*(2*x^2-x+3)^(3/2)+247435/10752*x^3*(2*x^2-x+3)^(3/2)+8825/448*x^4*(2*x^2-x+3)^(3/2)+125/16*x^5*(2*x^2-x+3)^(3/2)$

Maxima [A] time = 0.77788, size = 193, normalized size = 1.16

$$\begin{aligned} & \frac{125}{16}(2x^2-x+3)^{\frac{3}{2}}x^5 + \frac{8825}{448}(2x^2-x+3)^{\frac{3}{2}}x^4 + \frac{247435}{10752}(2x^2-x+3)^{\frac{3}{2}}x^3 \\ & + \frac{531681}{71680}(2x^2-x+3)^{\frac{3}{2}}x^2 - \frac{9627393}{1146880}(2x^2-x+3)^{\frac{3}{2}}x - \frac{22548119}{4587520}(2x^2-x+3)^{\frac{3}{2}} \\ & + \frac{6766097}{524288}\sqrt{2x^2-x+3}x + \frac{155620231}{8388608}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \frac{6766097}{2097152}\sqrt{2x^2-x+3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3),x, algorithm="maxima")`

[Out] $125/16*(2*x^2-x+3)^(3/2)*x^5 + 8825/448*(2*x^2-x+3)^(3/2)*x^4 + 247435/10752*(2*x^2-x+3)^(3/2)*x^3 + 531681/71680*(2*x^2-x+3)^(3/2)*x^2 - 9627393/1146880*(2*x^2-x+3)^(3/2)*x - 22548119/4587520*(2*x^2-x+3)^(3/2) + 6766097/524288*sqrt(2*x^2-x+3)*x + 155620231/8388608*sqrt(2)*\operatorname{arcsinh}(1/23*sqrt(23)*(4*x-1)) - 6766097/2097152*sqrt(2*x^2-x+3)$

Fricas [A] time = 0.281996, size = 130, normalized size = 0.78

$$\frac{1}{1761607680}\sqrt{2}\left(4\sqrt{2}(3440640000x^7 + 6955008000x^6 + 10958233600x^5 + 11212171264x^4 + 9872163456x^3 + 4583812128x^2 - 1621307916x - 3957369321)*\sqrt{2x^2-x+3} + 16340124255*\log(-\sqrt{2}*(32x^2-16x+25)) - 8*\sqrt{2x^2-x+3}*(4x^2-x+3)^{3/2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3),x, algorithm="fricas")`

[Out] $1/1761607680*sqrt(2)*(4*sqrt(2)*(3440640000*x^7 + 6955008000*x^6 + 10958233600*x^5 + 11212171264*x^4 + 9872163456*x^3 + 4583812128*x^2 - 1621307916*x - 3957369321)*sqrt(2*x^2-x+3) + 16340124255*log(-sqrt(2)*(32*x^2-16*x+25)) - 8*sqrt(2*x^2-x+3)*(4*x^2-x+3)^{3/2})$

- 1)))

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

$$\int \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**3*(2*x**2-x+3)**(1/2),x)

[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3, x)

GIAC/XCAS [A] time = 0.270052, size = 112, normalized size = 0.67

$$\frac{1}{220200960} (4(8(4(16(100(120(140x + 283)x + 53507)x + 5474693)x + 77126277)x + 143244129)x - 405326979)x - 395736932) - \frac{155620231}{8388608} \sqrt{2} \ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3),x, algorithm="giac")

[Out] 1/220200960*(4*(8*(4*(16*(100*(120*(140*x + 283)*x + 53507)*x + 5474693)*x + 77126277)*x + 143244129)*x - 405326979)*x - 395736932
1)*sqrt(2*x^2 - x + 3) - 155620231/8388608*sqrt(2)*ln(-2*sqrt(2)*
(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.60 \quad \int \sqrt{3 - x + 2x^2} (2 + 3x + 5x^2)^2 dx$$

Optimal. Leaf size=124

$$\begin{aligned} & \frac{63}{16} (2x^2 - x + 3)^{3/2} x^2 + \frac{769}{256} (2x^2 - x + 3)^{3/2} x - \frac{2107 (2x^2 - x + 3)^{3/2}}{3072} \\ & + \frac{12371(1 - 4x)\sqrt{2x^2 - x + 3}}{16384} + \frac{25}{12} (2x^2 - x + 3)^{3/2} x^3 + \frac{284533 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32768\sqrt{2}} \end{aligned}$$

[Out] (12371*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/16384 - (2107*(3 - x + 2*x^2)^(3/2))/3072 + (769*x*(3 - x + 2*x^2)^(3/2))/256 + (63*x^2*(3 - x + 2*x^2)^(3/2))/16 + (25*x^3*(3 - x + 2*x^2)^(3/2))/12 + (284533*ArcSinh[(1 - 4*x)/Sqrt[23]])/(32768*Sqrt[2])

Rubi [A] time = 0.174966, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{63}{16} (2x^2 - x + 3)^{3/2} x^2 + \frac{769}{256} (2x^2 - x + 3)^{3/2} x - \frac{2107 (2x^2 - x + 3)^{3/2}}{3072} \\ & + \frac{12371(1 - 4x)\sqrt{2x^2 - x + 3}}{16384} + \frac{25}{12} (2x^2 - x + 3)^{3/2} x^3 + \frac{284533 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32768\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2,x]

[Out] (12371*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/16384 - (2107*(3 - x + 2*x^2)^(3/2))/3072 + (769*x*(3 - x + 2*x^2)^(3/2))/256 + (63*x^2*(3 - x + 2*x^2)^(3/2))/16 + (25*x^3*(3 - x + 2*x^2)^(3/2))/12 + (284533*ArcSinh[(1 - 4*x)/Sqrt[23]])/(32768*Sqrt[2])

Rubi in Sympy [A] time = 23.1646, size = 105, normalized size = 0.85

$$\begin{aligned} & -\frac{\left(-\frac{6429x}{2} + \frac{81141}{8}\right) (2x^2 - x + 3)^{\frac{3}{2}}}{5760} + \frac{12371(-4x + 1)\sqrt{2x^2 - x + 3}}{16384} \\ & + \frac{\left(50x + \frac{129}{2}\right) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)}{120} - \frac{284533\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{65536} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**2*(2*x**2-x+3)**(1/2),x)`

[Out]
$$-(-6429*x/2 + 81141/8)*(2*x**2 - x + 3)**(3/2)/5760 + 12371*(-4*x + 1)*\sqrt{2*x**2 - x + 3}/16384 + (50*x + 129/2)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)/120 - 284533*\sqrt{2}*atanh(\sqrt{2}*(4*x - 1)/(4*\sqrt{2*x**2 - x + 3}))/65536$$

Mathematica [A] time = 0.0787136, size = 65, normalized size = 0.52

$$\frac{4\sqrt{2x^2 - x + 3}(204800x^5 + 284672x^4 + 408960x^3 + 365536x^2 + 328204x - 64023) - 853599\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{196608}$$

Antiderivative was successfully verified.

[In] `Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2,x]`

[Out]
$$(4*\text{Sqrt}[3 - x + 2*x^2]*(-64023 + 328204*x + 365536*x^2 + 408960*x^3 + 284672*x^4 + 204800*x^5) - 853599*\text{Sqrt}[2]*\text{ArcSinh}[(-1 + 4*x)/\text{Sqrt}[23]])/196608$$

Maple [A] time = 0.009, size = 98, normalized size = 0.8

$$-\frac{49484x - 12371}{16384}\sqrt{2x^2 - x + 3} - \frac{284533\sqrt{2}}{65536}\text{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) - \frac{2107}{3072}(2x^2 - x + 3)^{\frac{3}{2}} + \frac{769x}{256}(2x^2 - x + 3)^{\frac{3}{2}} + \frac{63x^2}{16}(2x^2 - x + 3)^{\frac{3}{2}} + \frac{25x^3}{12}(2x^2 - x + 3)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^2*(2*x^2-x+3)^(1/2),x)`

[Out]
$$-12371/16384*(4*x-1)*(2*x^2-x+3)^(1/2)-284533/65536*2^(1/2)*\text{arcsinh}(4/23*23^(1/2)*(x-1/4))-2107/3072*(2*x^2-x+3)^(3/2)+769/256*x*(2*x^2-x+3)^(3/2)+63/16*x^2*(2*x^2-x+3)^(3/2)+25/12*x^3*(2*x^2-x+3)^(3/2)$$

Maxima [A] time = 0.769964, size = 147, normalized size = 1.19

$$\frac{25}{12} (2x^2 - x + 3)^{\frac{3}{2}} x^3 + \frac{63}{16} (2x^2 - x + 3)^{\frac{3}{2}} x^2 + \frac{769}{256} (2x^2 - x + 3)^{\frac{3}{2}} x - \frac{2107}{3072} (2x^2 - x + 3)^{\frac{3}{2}} - \frac{12371}{4096} \sqrt{2x^2 - x + 3} x - \frac{284533}{65536} \sqrt{2} \operatorname{arsinh} \left(\frac{1}{23} \sqrt{23}(4x - 1) \right) + \frac{12371}{16384} \sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3),x, algorithm="maxima")

[Out] 25/12*(2*x^2 - x + 3)^(3/2)*x^3 + 63/16*(2*x^2 - x + 3)^(3/2)*x^2 + 769/256*(2*x^2 - x + 3)^(3/2)*x - 2107/3072*(2*x^2 - x + 3)^(3/2) - 12371/4096*sqrt(2*x^2 - x + 3)*x - 284533/65536*sqrt(2)*arc sinh(1/23*sqrt(23)*(4*x - 1)) + 12371/16384*sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.27817, size = 116, normalized size = 0.94

$$\frac{1}{393216} \sqrt{2} \left(4 \sqrt{2} (204800x^5 + 284672x^4 + 408960x^3 + 365536x^2 + 328204x - 64023) \sqrt{2x^2 - x + 3} + 853599 \log \left(-\sqrt{2}(32x^2 - 16x + 25) + 8\sqrt{2x^2 - x + 3}(4x - 1) \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3),x, algorithm="fricas")

[Out] 1/393216*sqrt(2)*(4*sqrt(2)*(204800*x^5 + 284672*x^4 + 408960*x^3 + 365536*x^2 + 328204*x - 64023)*sqrt(2*x^2 - x + 3) + 853599*log(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))

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

$$\int \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**2*(2*x**2-x+3)**(1/2),x)

[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2, x)

GIAC/XCAS [A] time = 0.270643, size = 99, normalized size = 0.8

$$\frac{1}{49152} (4(8(4(16(100x + 139)x + 3195)x + 11423)x + 82051)x - 64023)\sqrt{2x^2 - x + 3} + \frac{284533}{65536} \sqrt{2} \ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3),x, algorithm="giac")`

[Out] `1/49152*(4*(8*(4*(16*(100*x + 139)*x + 3195)*x + 11423)*x + 82051)*x - 64023)*sqrt(2*x^2 - x + 3) + 284533/65536*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)`

$$3.61 \quad \int \sqrt{3 - x + 2x^2} (2 + 3x + 5x^2) dx$$

Optimal. Leaf size=82

$$\frac{5}{8}x(2x^2 - x + 3)^{3/2} + \frac{73}{96}(2x^2 - x + 3)^{3/2} - \frac{81}{512}(1 - 4x)\sqrt{2x^2 - x + 3} - \frac{1863 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1024\sqrt{2}}$$

[Out] (-81*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/512 + (73*(3 - x + 2*x^2)^(3/2))/96 + (5*x*(3 - x + 2*x^2)^(3/2))/8 - (1863*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1024*Sqrt[2])

Rubi [A] time = 0.0854822, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{5}{8}x(2x^2 - x + 3)^{3/2} + \frac{73}{96}(2x^2 - x + 3)^{3/2} - \frac{81}{512}(1 - 4x)\sqrt{2x^2 - x + 3} - \frac{1863 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1024\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2), x]

[Out] (-81*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/512 + (73*(3 - x + 2*x^2)^(3/2))/96 + (5*x*(3 - x + 2*x^2)^(3/2))/8 - (1863*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1024*Sqrt[2])

Rubi in Sympy [A] time = 10.173, size = 73, normalized size = 0.89

$$-\frac{81(-4x + 1)\sqrt{2x^2 - x + 3}}{512} + \frac{(30x + \frac{73}{2})(2x^2 - x + 3)^{\frac{3}{2}}}{48} + \frac{1863\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{2048}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)*(2*x**2-x+3)**(1/2), x)

[Out] -81*(-4*x + 1)*sqrt(2*x**2 - x + 3)/512 + (30*x + 73/2)*(2*x**2 - x + 3)**(3/2)/48 + 1863*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/2048

Mathematica [A] time = 0.0511416, size = 55, normalized size = 0.67

$$\frac{4\sqrt{2x^2 - x + 3} (1920x^3 + 1376x^2 + 2684x + 3261) + 5589\sqrt{2} \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{6144}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2), x]

[Out] (4*Sqrt[3 - x + 2*x^2]*(3261 + 2684*x + 1376*x^2 + 1920*x^3) + 5589*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/6144

Maple [A] time = 0.008, size = 64, normalized size = 0.8

$$\frac{324x - 81}{512} \sqrt{2x^2 - x + 3} + \frac{1863\sqrt{2}}{2048} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{73}{96} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{5x}{8} (2x^2 - x + 3)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)*(2*x^2-x+3)^(1/2), x)

[Out] 81/512*(4*x-1)*(2*x^2-x+3)^(1/2)+1863/2048*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+73/96*(2*x^2-x+3)^(3/2)+5/8*x*(2*x^2-x+3)^(3/2)

Maxima [A] time = 0.771803, size = 101, normalized size = 1.23

$$\begin{aligned} & \frac{5}{8} (2x^2 - x + 3)^{\frac{3}{2}} x + \frac{73}{96} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{81}{128} \sqrt{2x^2 - x + 3} x \\ & + \frac{1863}{2048} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{81}{512} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 5/8*(2*x^2 - x + 3)^(3/2)*x + 73/96*(2*x^2 - x + 3)^(3/2) + 81/128*sqrt(2*x^2 - x + 3)*x + 1863/2048*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 81/512*sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.277699, size = 103, normalized size = 1.26

$$\frac{1}{12288} \sqrt{2} \left(4 \sqrt{2} (1920x^3 + 1376x^2 + 2684x + 3261) \sqrt{2x^2 - x + 3} + 5589 \log \left(-\sqrt{2} (32x^2 - 16x + 25) - 8 \sqrt{2x^2 - x + 3} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3),x, algorithm="fricas")

[Out] 1/12288*sqrt(2)*(4*sqrt(2)*(1920*x^3 + 1376*x^2 + 2684*x + 3261)*sqrt(2*x^2 - x + 3) + 5589*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))

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

$$\int \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)*(2*x**2-x+3)**(1/2),x)

[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2), x)

GIAC/XCAS [A] time = 0.270001, size = 85, normalized size = 1.04

$$\frac{1}{1536} (4(8(60x + 43)x + 671)x + 3261) \sqrt{2x^2 - x + 3} - \frac{1863}{2048} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3),x, algorithm="giac")

[Out] 1/1536*(4*(8*(60*x + 43)*x + 671)*x + 3261)*sqrt(2*x^2 - x + 3) - 1863/2048*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.62 \quad \int \frac{\sqrt{3-x+2x^2}}{2+3x+5x^2} dx$$

Optimal. Leaf size=174

$$\begin{aligned} & \frac{1}{5} \sqrt{\frac{11}{31} (13 + 10\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{62(13+10\sqrt{2})}} \left((20 + 13\sqrt{2})x + 7\sqrt{2} + 6 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \frac{1}{5} \sqrt{\frac{11}{31} (10\sqrt{2} - 13)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{62(10\sqrt{2}-13)}} \left((20 - 13\sqrt{2})x - 7\sqrt{2} + 6 \right)}{\sqrt{2x^2 - x + 3}} \right) - \frac{1}{5} \sqrt{2} \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right) \end{aligned}$$

[Out] $-(\text{Sqrt}[2] * \text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/5 + (\text{Sqrt}[(11*(13 + 10*\text{Sqrt}[2]))/31] * \text{ArcTan}[(\text{Sqrt}[11/(62*(13 + 10*\text{Sqrt}[2]))]) * (6 + 7*\text{Sqrt}[2] + (20 + 13*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2]])/5 - (\text{Sqrt}[(11*(-13 + 10*\text{Sqrt}[2]))/31] * \text{ArcTanh}[(\text{Sqrt}[11/(62*(-13 + 10*\text{Sqrt}[2]))]) * (6 - 7*\text{Sqrt}[2] + (20 - 13*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2]])/5$

Rubi [A] time = 0.861891, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$

$$\begin{aligned} & \frac{1}{5} \sqrt{\frac{11}{31} (13 + 10\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{62(13+10\sqrt{2})}} \left((20 + 13\sqrt{2})x + 7\sqrt{2} + 6 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \frac{1}{5} \sqrt{\frac{11}{31} (10\sqrt{2} - 13)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{62(10\sqrt{2}-13)}} \left((20 - 13\sqrt{2})x - 7\sqrt{2} + 6 \right)}{\sqrt{2x^2 - x + 3}} \right) - \frac{1}{5} \sqrt{2} \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right) \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[\text{Sqrt}[3 - x + 2*x^2]/(2 + 3*x + 5*x^2), x]$

[Out] $-(\text{Sqrt}[2] * \text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/5 + (\text{Sqrt}[(11*(13 + 10*\text{Sqrt}[2]))/31] * \text{ArcTan}[(\text{Sqrt}[11/(62*(13 + 10*\text{Sqrt}[2]))]) * (6 + 7*\text{Sqrt}[2] + (20 + 13*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2]])/5 - (\text{Sqrt}[(11*(-13 + 10*\text{Sqrt}[2]))/31] * \text{ArcTanh}[(\text{Sqrt}[11/(62*(-13 + 10*\text{Sqrt}[2]))]) * (6 - 7*\text{Sqrt}[2] + (20 - 13*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2]])/5$

Rubi in Sympy [A] time = 75.4788, size = 204, normalized size = 1.17

$$\frac{\sqrt{341} (726 + 847\sqrt{2}) (242\sqrt{2} + 484) \operatorname{atan}\left(\frac{\sqrt{682}(x(1573\sqrt{2}+2420)+726+847\sqrt{2})}{7502\sqrt{13+10\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9077420\sqrt{13+10\sqrt{2}}} + \frac{\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{5}$$

$$+ \frac{\sqrt{341} (-847\sqrt{2} + 726) (-242\sqrt{2} + 484) \operatorname{atanh}\left(\frac{\sqrt{682}(x(-1573\sqrt{2}+2420)-847\sqrt{2}+726)}{7502\sqrt{-13+10\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9077420\sqrt{-13+10\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2), x)`

[Out] `sqrt(341)*(726 + 847*sqrt(2))*(242*sqrt(2) + 484)*atan(sqrt(682)*(x*(1573*sqrt(2) + 2420) + 726 + 847*sqrt(2))/(7502*sqrt(13 + 10*sqrt(2))*sqrt(2*x**2 - x + 3)))/(9077420*sqrt(13 + 10*sqrt(2))) + sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/5 + sqrt(341)*(-847*sqrt(2) + 726)*(-242*sqrt(2) + 484)*atanh(sqrt(682)*(x*(-1573*sqrt(2) + 2420) - 847*sqrt(2) + 726)/(7502*sqrt(-13 + 10*sqrt(2))*sqrt(2*x**2 - x + 3)))/(9077420*sqrt(-13 + 10*sqrt(2)))`

Mathematica [C] time = 6.41229, size = 1133, normalized size = 6.51

$$\frac{1}{5}\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)$$

$$i(-13i+\sqrt{31})\tan^{-1}\left(\frac{31(1100\sqrt{31}x^4-8675ix^4+2970\sqrt{31}x^3-31860ix^3-262775i\sqrt{31}x^4+443300x^4+10000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3x^3}-143180i\sqrt{31}x^3+514910x^3+3500i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3x^3}}{5\sqrt{\frac{62}{11}}(13+i\sqrt{31})}\right)$$

$$i(13i+\sqrt{31})\tanh^{-1}\left(\frac{262775\sqrt{31}x^4-443300ix^4+55000\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3x^3}+143180\sqrt{31}x^3-514910ix^3-124500\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3x^3}}{34100\sqrt{31}x^4+1493925ix^4+92070\sqrt{31}x^3-2052340ix^3+838000}\right)$$

$$5\sqrt{\frac{62}{11}}(-13+i\sqrt{31})$$

$$+ \frac{i(13i+\sqrt{31})\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{10\sqrt{\frac{62}{11}}(-13+i\sqrt{31})}$$

$$- \frac{(-13i+\sqrt{31})\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{10\sqrt{\frac{62}{11}}(13+i\sqrt{31})}$$

$$i(13i+\sqrt{31})\log\left((5x^2+3x+2)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3x}-22\sqrt{31}x+469ix+i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3x}\right)\right)$$

$$+ \frac{(-13i+\sqrt{31})\log\left((5x^2+3x+2)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3x}-22\sqrt{31}x+1041ix-63i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3x}\right)\right)}{10\sqrt{\frac{62}{11}}(13+i\sqrt{31})}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2),x]

[Out] (Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/5 - ((I/5)*(-13*I + Sqrt[31])*ArcTan[(31*(7588*I + 4224*Sqrt[31] - (27836*I)*x + 3872*Sqrt[31]*x + (4347*I)*x^2 + 2706*Sqrt[31]*x^2 - (31860*I)*x^3 + 2970*Sqrt[31]*x^3 - (8675*I)*x^4 + 1100*Sqrt[31]*x^4))/(65472 + (35044*I)*Sqrt[31] + 1083016*x - (46668*I)*Sqrt[31]*x + 340318*x^2 - (308889*I)*Sqrt[31]*x^2 + 514910*x^3 - (143180*I)*Sqrt[31]*x^3 + 443300*x^4 - (262775*I)*Sqrt[31]*x^4 - (1000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (2500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (3500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (10000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3


```

*Sqrt[3 - x + 2*x^2]])/Sqrt[(62*(13 + I*Sqrt[31]))/11] - ((I/5)*
(13*I + Sqrt[31])*ArcTanh[(-65472*I - 35044*Sqrt[31] - (1083016*I
)*x + 46668*Sqrt[31]*x - (340318*I)*x^2 + 308889*Sqrt[31]*x^2 - (
514910*I)*x^3 + 143180*Sqrt[31]*x^3 - (443300*I)*x^4 + 262775*Sqr
t[31]*x^4 - 63000*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2]
- 72500*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 1245
00*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 55000*Sq
rt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2)]/(1764772*I + 1
30944*Sqrt[31] + (2352916*I)*x + 120032*Sqrt[31]*x + (3090243*I)*
x^2 + 83886*Sqrt[31]*x^2 - (2052340*I)*x^3 + 92070*Sqrt[31]*x^3 +
(1493925*I)*x^4 + 34100*Sqrt[31]*x^4)]/Sqrt[(62*(-13 + I*Sqrt[3
1]))/11] - ((-13*I + Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2
*(3*I + Sqrt[31] + (10*I)*x)^2)]/(10*Sqrt[(62*(13 + I*Sqrt[31]))/
11]) + ((I/10)*(13*I + Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)
^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31]))/1
1] - ((I/10)*(13*I + Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66
*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]
*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)
*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]])/Sqrt[(62*(
-13 + I*Sqrt[31]))/11] + ((-13*I + Sqrt[31])*Log[(2 + 3*x + 5*x^2
)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x
^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 -
x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*
x^2]])/(10*Sqrt[(62*(13 + I*Sqrt[31]))/11])

```

Maple [B] time = 0.187, size = 2065, normalized size = 11.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(1/2)/(5*x^2+3*x+2), x)

```

[Out] 1/5*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+1/52855*(8*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-
3*2^(1/2))^2^(1/2)*2^(1/2)*(-285*2^(1/2)*arctan(1/11692487*(-775687
+549362*2^(1/2))^2^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2
^(1/2)+1-x)^2+24*2^(1/2)-41))^2^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1
/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+23*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(
-8866+6820*2^(1/2))^2^(1/2)*(-775687+549362*2^(1/2))^2^(1/2)-386*arct
an(1/11692487*(-775687+549362*2^(1/2))^2^(1/2)*(-23*(8+3*2^(1/2))*(-
23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^2^(1/2)*(6485*2
^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2(
1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x
)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23*(8+3*2^(1/2))*(2^(1/2)
-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^2^(1/2)*(-775687+549362*2
^(1/2))^2^(1/2)+274846*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x

```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{5x^2 + 3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="maxima")

[Out] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2), x)

Fricas [A] time = 0.337173, size = 1397, normalized size = 8.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="fricas")

[Out]
$$\begin{aligned} & -1/480500 * \sqrt{155} * \sqrt{31} * \sqrt{5} * (2 * \sqrt{155} * \sqrt{31} * \sqrt{5} \\ &) * (13 * \sqrt{2} - 20) * \sqrt{((13 * \sqrt{2} - 20) / (260 * \sqrt{2} - 369))} * \log(-4 * \sqrt{2} * \sqrt{2 * x^2 - x + 3} * (4 * x - 1) - 32 * x^2 + 16 * x - 25) \\ & - 5 * 242^{(1/4)} * \sqrt{31} * (10 * \sqrt{2} - 13) * \log(-8/5 * (2 * 242^{(1/4)} * \sqrt{155} * \sqrt{5} * \sqrt{2 * x^2 - x + 3} * (\sqrt{2} * (61198 * x + 25353) - \\ & 86551 * x - 35845) * \sqrt{((13 * \sqrt{2} - 20) / (260 * \sqrt{2} - 369))} + 3 \\ & 464300 * x^2 + 220 * \sqrt{2} * (28280 * x^2 - 9997 * \sqrt{2} * (2 * x^2 - x + 3) \\ &) - 14140 * x + 42420) - 49985 * \sqrt{2} * (49 * x^2 - 151 * x + 200) - 106 \\ & 75700 * x + 14140000) / (9997 * \sqrt{2} * x^2 - 14140 * x^2) + 5 * 242^{(1/4)} \\ & * \sqrt{31} * (10 * \sqrt{2} - 13) * \log(8/5 * (2 * 242^{(1/4)} * \sqrt{155} * \sqrt{5} \\ &) * \sqrt{2 * x^2 - x + 3} * (\sqrt{2} * (61198 * x + 25353) - 86551 * x - 3584 \\ & 5) * \sqrt{((13 * \sqrt{2} - 20) / (260 * \sqrt{2} - 369))} - 3464300 * x^2 - 22 \\ & 0 * \sqrt{2} * (28280 * x^2 - 9997 * \sqrt{2} * (2 * x^2 - x + 3) - 14140 * x + 4 \\ & 2420) + 49985 * \sqrt{2} * (49 * x^2 - 151 * x + 200) + 10675700 * x - 14140 \\ & 000) / (9997 * \sqrt{2} * x^2 - 14140 * x^2) + 620 * 242^{(1/4)} * \arctan(31 * (\sqrt{155} * \sqrt{5} * (10 * \sqrt{2} * (x - 6) - 13 * x + 78) * \sqrt{((13 * \sqrt{2} \\ &) - 20) / (260 * \sqrt{2} - 369))} + 10 * 242^{(1/4)} * \sqrt{2 * x^2 - x + 3} * (\\ & 3 * \sqrt{2} - 7)) / (2 * \sqrt{155} * \sqrt{31} * \sqrt{5} * \sqrt{2/5} * (10 * \sqrt{2} \\ &) * x - 13 * x) * \sqrt{-(2 * 242^{(1/4)} * \sqrt{155} * \sqrt{5} * \sqrt{2 * x^2 - x \\ & + 3} * (\sqrt{2} * (61198 * x + 25353) - 86551 * x - 35845) * \sqrt{((13 * \sqrt{2} \\ &) - 20) / (260 * \sqrt{2} - 369))} + 3464300 * x^2 + 220 * \sqrt{2} * (28280 * \\ & x^2 - 9997 * \sqrt{2} * (2 * x^2 - x + 3) - 14140 * x + 42420) - 49985 * \sqrt{2} * (49 * x^2 - 151 * x + 200) - 10675700 * x + 14140000) / (9997 * \sqrt{2} \\ &) * x^2 - 14140 * x^2) * \sqrt{((13 * \sqrt{2} - 20) / (260 * \sqrt{2} - 369))} + \\ & \sqrt{155} * \sqrt{31} * \sqrt{5} * (10 * \sqrt{2} * (19 * x - 22) - 247 * x + 286 \\ &) * \sqrt{((13 * \sqrt{2} - 20) / (260 * \sqrt{2} - 369))} - 310 * 242^{(1/4)} * \sqrt{31} * \sqrt{5} * \sqrt{2} * \sqrt{2 * x^2 - x + 3} * \sqrt{((13 * \sqrt{2} - 20) / (260 * \sqrt{2} - 369))} \end{aligned}$$

```
t(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) - 1))) + 620*242^(1/4)*arctan(
-31*(sqrt(155)*sqrt(5)*(10*sqrt(2)*(x - 6) - 13*x + 78)*sqrt((13*
sqrt(2) - 20)/(260*sqrt(2) - 369)) - 10*242^(1/4)*sqrt(2*x^2 - x
+ 3)*(3*sqrt(2) - 7))/(2*sqrt(155)*sqrt(31)*sqrt(5)*sqrt(2/5)*(10
*sqrt(2)*x - 13*x)*sqrt((2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2
- x + 3)*(sqrt(2)*(61198*x + 25353) - 86551*x - 35845)*sqrt((13*
sqrt(2) - 20)/(260*sqrt(2) - 369)) - 3464300*x^2 - 220*sqrt(2)*(2
8280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) + 4998
5*sqrt(2)*(49*x^2 - 151*x + 200) + 10675700*x - 14140000)/(9997*s
qrt(2)*x^2 - 14140*x^2))*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 36
9)) + sqrt(155)*sqrt(31)*sqrt(5)*(10*sqrt(2)*(19*x - 22) - 247*x
+ 286)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 310*242^(1/4
)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) - 1)))/((10*sqrt(2) - 13
)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)))
```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{5x^2 + 3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2), x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)/(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2), x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

$$3.63 \quad \int \frac{\sqrt{3-x+2x^2}}{(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=188

$$\begin{aligned} & \frac{\sqrt{2x^2 - x + 3}(10x + 3)}{31(5x^2 + 3x + 2)} \\ & + \frac{1}{62} \sqrt{\frac{1}{682} (70517 + 49942\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(70517+49942\sqrt{2})}} \left((973 + 696\sqrt{2})x + 277\sqrt{2} + 419 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \frac{1}{62} \sqrt{\frac{1}{682} (49942\sqrt{2} - 70517)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(49942\sqrt{2}-70517)}} \left((973 - 696\sqrt{2})x - 277\sqrt{2} + 419 \right)}{\sqrt{2x^2 - x + 3}} \right) \end{aligned}$$

[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(31*(2 + 3*x + 5*x^2)) + (Sqrt[(70517 + 49942*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(70517 + 49942*Sqrt[2]))])*(419 + 277*Sqrt[2] + (973 + 696*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/62 - (Sqrt[(-70517 + 49942*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-70517 + 49942*Sqrt[2]))])*(419 - 277*Sqrt[2] + (973 - 696*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/62

Rubi [A] time = 0.807527, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{\sqrt{2x^2 - x + 3}(10x + 3)}{31(5x^2 + 3x + 2)} \\ & + \frac{1}{62} \sqrt{\frac{1}{682} (70517 + 49942\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(70517+49942\sqrt{2})}} \left((973 + 696\sqrt{2})x + 277\sqrt{2} + 419 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \frac{1}{62} \sqrt{\frac{1}{682} (49942\sqrt{2} - 70517)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(49942\sqrt{2}-70517)}} \left((973 - 696\sqrt{2})x - 277\sqrt{2} + 419 \right)}{\sqrt{2x^2 - x + 3}} \right) \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2)^2,x]

[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(31*(2 + 3*x + 5*x^2)) + (Sqrt[(70517 + 49942*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(70517 + 49942*Sqrt[2]))])*(419 + 277*Sqrt[2] + (973 + 696*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/62 - (Sqrt[(-70517 + 49942*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-70517 + 49942*Sqrt[2]))])*(419 - 277*Sqrt[2] + (973 - 696*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/62

rt[2]))]*(419 + 277*Sqrt[2] + (973 + 696*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2])/62 - (Sqrt[(-70517 + 49942*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-70517 + 49942*Sqrt[2]))]*(419 - 277*Sqrt[2] + (973 - 696*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/62

Rubi in Sympy [A] time = 80.3057, size = 219, normalized size = 1.16

$$\frac{(10x + 3)\sqrt{2x^2 - x + 3}}{31(5x^2 + 3x + 2)} + \frac{\sqrt{682} \left(935 + 693\sqrt{2}\right) \left(\frac{3047\sqrt{2}}{2} + \frac{4609}{2}\right) \operatorname{atan}\left(\frac{2\sqrt{341}\left(x\left(\frac{10703}{2} + 3828\sqrt{2}\right) + \frac{3047\sqrt{2}}{2} + \frac{4609}{2}\right)}{341\sqrt{70517 + 49942\sqrt{2}}\sqrt{2x^2 - x + 3}}\right)}{2558182\sqrt{70517 + 49942\sqrt{2}}} + \frac{\sqrt{682} \left(-\frac{3047\sqrt{2}}{2} + \frac{4609}{2}\right) \left(-693\sqrt{2} + 935\right) \operatorname{atanh}\left(\frac{2\sqrt{341}\left(x\left(-3828\sqrt{2} + \frac{10703}{2}\right) - \frac{3047\sqrt{2}}{2} + \frac{4609}{2}\right)}{341\sqrt{-70517 + 49942\sqrt{2}}\sqrt{2x^2 - x + 3}}\right)}{2558182\sqrt{-70517 + 49942\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**2,x)`

[Out] `(10*x + 3)*sqrt(2*x**2 - x + 3)/(31*(5*x**2 + 3*x + 2)) + sqrt(682)*(935 + 693*sqrt(2))*(3047*sqrt(2)/2 + 4609/2)*atan(2*sqrt(341)*(x*(10703/2 + 3828*sqrt(2)) + 3047*sqrt(2)/2 + 4609/2)/(341*sqrt(70517 + 49942*sqrt(2))*sqrt(2*x**2 - x + 3)))/(2558182*sqrt(70517 + 49942*sqrt(2))) + sqrt(682)*(-3047*sqrt(2)/2 + 4609/2)*(-693*sqrt(2) + 935)*atanh(2*sqrt(341)*(x*(-3828*sqrt(2) + 10703/2) - 3047*sqrt(2)/2 + 4609/2)/(341*sqrt(-70517 + 49942*sqrt(2))*sqrt(2*x**2 - x + 3)))/(2558182*sqrt(-70517 + 49942*sqrt(2)))`

$$\begin{aligned}
& 682*(13 + I*\text{Sqrt}[31]))*x^2*\text{Sqrt}[3 - x + 2*x^2] + (12485500*I)*\text{Sqrt} \\
& \text{t}[682*(13 + I*\text{Sqrt}[31]))*x^3*\text{Sqrt}[3 - x + 2*x^2]])/\text{Sqrt}[682*(13 \\
& + I*\text{Sqrt}[31])] - ((I/31)*(348*I + 11*\text{Sqrt}[31])*ArcTanh[(11*(21126 \\
& 3399*I + 13499973*\text{Sqrt}[31] + (246761997*I)*x + 3295269*\text{Sqrt}[31]*x \\
& + (273535156*I)*x^2 + 7526862*\text{Sqrt}[31]*x^2 - (265194380*I)*x^3 + \\
& 4821740*\text{Sqrt}[31]*x^3 + (102207600*I)*x^4 + 750200*\text{Sqrt}[31]*x^4)) \\
& /((-274003389*I - 48486603*\text{Sqrt}[31] - (1344149367*I)*x + 112716791 \\
& *\text{Sqrt}[31]*x - (95778716*I)*x^2 + 264613118*\text{Sqrt}[31]*x^2 - (826454 \\
& 420*I)*x^3 + 92760910*\text{Sqrt}[31]*x^3 - (261069600*I)*x^4 + 23914330 \\
& 0*\text{Sqrt}[31]*x^4 - 78658650*\text{Sqrt}[22*(-13 + I*\text{Sqrt}[31]))*\text{Sqrt}[3 - x \\
& + 2*x^2] - 90519875*\text{Sqrt}[22*(-13 + I*\text{Sqrt}[31]))*x*\text{Sqrt}[3 - x + 2* \\
& x^2] - 155444475*\text{Sqrt}[22*(-13 + I*\text{Sqrt}[31]))*x^2*\text{Sqrt}[3 - x + 2*x \\
& ^2] + 68670250*\text{Sqrt}[22*(-13 + I*\text{Sqrt}[31]))*x^3*\text{Sqrt}[3 - x + 2*x^2 \\
&])))/\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])] - ((-348*I + 11*\text{Sqrt}[31])*Log[(\\
& -3*I + \text{Sqrt}[31] - (10*I)*x)^2*(3*I + \text{Sqrt}[31] + (10*I)*x)^2])/(62 \\
& *\text{Sqrt}[682*(13 + I*\text{Sqrt}[31])]) + ((I/62)*(348*I + 11*\text{Sqrt}[31])*Log \\
& [(-3*I + \text{Sqrt}[31] - (10*I)*x)^2*(3*I + \text{Sqrt}[31] + (10*I)*x)^2])/S \\
& \text{qrt}[682*(-13 + I*\text{Sqrt}[31])] - ((I/62)*(348*I + 11*\text{Sqrt}[31])*Log[(\\
& 2 + 3*x + 5*x^2)*(-142*I + 66*\text{Sqrt}[31] + (469*I)*x - 22*\text{Sqrt}[31]* \\
& x + (327*I)*x^2 + 44*\text{Sqrt}[31]*x^2 + I*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31]) \\
&]*\text{Sqrt}[3 - x + 2*x^2] - (4*I)*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31]))*x*\text{Sqrt} \\
& [3 - x + 2*x^2]])/\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])] + ((-348*I + 11*S \\
& \text{qrt}[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*\text{Sqrt}[31] + (1041*I)* \\
& x - 22*\text{Sqrt}[31]*x - (817*I)*x^2 + 44*\text{Sqrt}[31]*x^2 - (63*I)*\text{Sqrt}[2 \\
& 2*(13 + I*\text{Sqrt}[31]))*\text{Sqrt}[3 - x + 2*x^2] + (22*I)*\text{Sqrt}[22*(13 + I \\
& *\text{Sqrt}[31]))*x*\text{Sqrt}[3 - x + 2*x^2]])/(62*\text{Sqrt}[682*(13 + I*\text{Sqrt}[31 \\
&]))
\end{aligned}$$

Maple [B] time = 0.248, size = 16357, normalized size = 87.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2*x^2-x+3)^{(1/2)}/(5*x^2+3*x+2)^2, x)$

[Out] result too large to display

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")

[Out] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2, x)

Fricas [A] time = 0.354029, size = 1465, normalized size = 7.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")

[Out]
$$\begin{aligned} & -1/44646566236976*232562^{(3/4)}*\text{sqrt}(24971)*\text{sqrt}(31)*(8*232562^{(1/4)} \\ & *\text{sqrt}(24971)*\text{sqrt}(31)*\text{sqrt}(2*x^2 - x + 3)*(70517*\text{sqrt}(2)*(10*x \\ & + 3) - 998840*x - 299652)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(704352002 \\ & 8*\text{sqrt}(2) - 9961054017)) - 88412*\text{sqrt}(24971)*\text{sqrt}(2)*(5*x^2 + 3*x \\ & + 2)*\text{arctan}(31*(232562^{(1/4)}*\text{sqrt}(24971)*(70517*\text{sqrt}(2)*(x - 6) \\ & - 99884*x + 599304)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(7043520028*\text{sqrt} \\ & (2) - 9961054017)) + 44*\text{sqrt}(24971)*\text{sqrt}(2*x^2 - x + 3)*(277*\text{sqrt} \\ & (2) - 419))/(2*232562^{(1/4)}*\text{sqrt}(24971)*\text{sqrt}(31)*(70517*\text{sqrt}(2)*x \\ & - 99884*x)*\text{sqrt}(-\text{sqrt}(2)*(46*232562^{(1/4)}*\text{sqrt}(2*x^2 - x + 3)*(s \\ & \text{qrt}(2)*(38160719038345833*x + 15806687373343727) - 53967406411689 \\ & 560*x - 22354031665002106)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(70435200 \\ & 28*\text{sqrt}(2) - 9961054017)) + 349945327259084480*x^2 + \text{sqrt}(2)*(974 \\ & 27960430086020*x^2 - 1405958600593541*\text{sqrt}(2)*(49*x^2 - 151*x + 2 \\ & 00) - 300237184182509980*x + 397665144612596000) - 12372435685223 \\ & 1608*\text{sqrt}(2)*(2*x^2 - x + 3) - 174972663629542240*x + 52491799088 \\ & 8626720)/(1405958600593541*\text{sqrt}(2)*x^2 - 1988325723062980*x^2))*s \\ & \text{qrt}((70517*\text{sqrt}(2) - 99884)/(7043520028*\text{sqrt}(2) - 9961054017)) + \\ & 232562^{(1/4)}*\text{sqrt}(24971)*\text{sqrt}(31)*(70517*\text{sqrt}(2)*(19*x - 22) - 18 \\ & 97796*x + 2197448)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(7043520028*\text{sqrt} \\ & (2) - 9961054017)) - 1364*\text{sqrt}(24971)*\text{sqrt}(31)*\text{sqrt}(2*x^2 - x + 3) \\ & *(63*\text{sqrt}(2) - 85))) - 88412*\text{sqrt}(24971)*\text{sqrt}(2)*(5*x^2 + 3*x + 2 \\ &)*\text{arctan}(-31*(232562^{(1/4)}*\text{sqrt}(24971)*(70517*\text{sqrt}(2)*(x - 6) - 9 \\ & 9884*x + 599304)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(7043520028*\text{sqrt}(2) \\ & - 9961054017)) - 44*\text{sqrt}(24971)*\text{sqrt}(2*x^2 - x + 3)*(277*\text{sqrt}(2) \\ & - 419))/(2*232562^{(1/4)}*\text{sqrt}(24971)*\text{sqrt}(31)*(70517*\text{sqrt}(2)*x - \\ & 99884*x)*\text{sqrt}(\text{sqrt}(2)*(46*232562^{(1/4)}*\text{sqrt}(2*x^2 - x + 3))*(\text{sqrt} \\ & (2)*(38160719038345833*x + 15806687373343727) - 53967406411689560* \\ & x - 22354031665002106)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(7043520028*s \\ & \text{qrt}(2) - 9961054017)) - 349945327259084480*x^2 - \text{sqrt}(2)*(9742796 \\ & 0430086020*x^2 - 1405958600593541*\text{sqrt}(2)*(49*x^2 - 151*x + 200) \\ & - 300237184182509980*x + 397665144612596000) + 123724356852231608 \\ & *\text{sqrt}(2)*(2*x^2 - x + 3) + 174972663629542240*x - 524917990888626 \\ & 720)/(1405958600593541*\text{sqrt}(2)*x^2 - 1988325723062980*x^2))*\text{sqrt} \\ & ((70517*\text{sqrt}(2) - 99884)/(7043520028*\text{sqrt}(2) - 9961054017)) + 2325 \\ & 62^{(1/4)}*\text{sqrt}(24971)*\text{sqrt}(31)*(70517*\text{sqrt}(2)*(19*x - 22) - 189779 \\ & 6*x + 2197448)*\text{sqrt}((70517*\text{sqrt}(2) - 99884)/(7043520028*\text{sqrt}(2) - \\ & 9961054017)) + 1364*\text{sqrt}(24971)*\text{sqrt}(31)*\text{sqrt}(2*x^2 - x + 3)*(63 \end{aligned}$$

```
*sqrt(2) - 85))) - sqrt(24971)*sqrt(31)*(499420*x^2 - 70517*sqrt(
2)*(5*x^2 + 3*x + 2) + 299652*x + 199768)*log(-2494203364*sqrt(2)
*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(38160719038345833
*x + 15806687373343727) - 53967406411689560*x - 22354031665002106
)*sqrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2) - 9961054017))
+ 349945327259084480*x^2 + sqrt(2)*(97427960430086020*x^2 - 1405
958600593541*sqrt(2)*(49*x^2 - 151*x + 200) - 300237184182509980*
x + 397665144612596000) - 123724356852231608*sqrt(2)*(2*x^2 - x +
3) - 174972663629542240*x + 524917990888626720)/(140595860059354
1*sqrt(2)*x^2 - 1988325723062980*x^2)) + sqrt(24971)*sqrt(31)*(49
9420*x^2 - 70517*sqrt(2)*(5*x^2 + 3*x + 2) + 299652*x + 199768)*l
og(2494203364*sqrt(2)*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(
2)*(38160719038345833*x + 15806687373343727) - 53967406411689560*
x - 22354031665002106)*sqrt((70517*sqrt(2) - 99884)/(7043520028*s
qrt(2) - 9961054017)) - 349945327259084480*x^2 - sqrt(2)*(9742796
0430086020*x^2 - 1405958600593541*sqrt(2)*(49*x^2 - 151*x + 200)
- 300237184182509980*x + 397665144612596000) + 123724356852231608
*sqrt(2)*(2*x^2 - x + 3) + 174972663629542240*x - 524917990888626
720)/(1405958600593541*sqrt(2)*x^2 - 1988325723062980*x^2)))/((49
9420*x^2 - 70517*sqrt(2)*(5*x^2 + 3*x + 2) + 299652*x + 199768)*s
qrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2) - 9961054017)))
```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**2, x)

[Out] Integral(sqrt(2*x**2 - x + 3)/(5*x**2 + 3*x + 2)**2, x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2, x, algorithm="giac")

[Out] Exception raised: RuntimeError

$$3.64 \quad \int \frac{\sqrt{3-x+2x^2}}{(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=223

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{62(5x^2+3x+2)^2} + \frac{(13665x+3464)\sqrt{2x^2-x+3}}{84568(5x^2+3x+2)}$$

$$+ \frac{\sqrt{\frac{1}{682}(112285869463+79399380740\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(112285869463+79399380740\sqrt{2})}}((1235163+872375\sqrt{2})x+362788\sqrt{2}+509587)}}{\sqrt{2x^2-x+3}}\right)}{169136}$$

$$+ \frac{\sqrt{\frac{1}{682}(79399380740\sqrt{2}-112285869463)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(79399380740\sqrt{2}-112285869463)}}((1235163-872375\sqrt{2})x-362788\sqrt{2}+509587)}}{\sqrt{2x^2-x+3}}\right)}{169136}$$

[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(62*(2 + 3*x + 5*x^2)^2) + ((3464 + 13665*x)*Sqrt[3 - x + 2*x^2])/(84568*(2 + 3*x + 5*x^2)) + (Sqrt[(112285869463 + 79399380740*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(112285869463 + 79399380740*Sqrt[2]))])*(509587 + 362788*Sqrt[2] + (1235163 + 872375*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/169136 - (Sqrt[(-112285869463 + 79399380740*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(-112285869463 + 79399380740*Sqrt[2]))])*(509587 - 362788*Sqrt[2] + (1235163 - 872375*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/169136

Rubi [A] time = 0.970659, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{62(5x^2+3x+2)^2} + \frac{(13665x+3464)\sqrt{2x^2-x+3}}{84568(5x^2+3x+2)}$$

$$+ \frac{\sqrt{\frac{1}{682}(112285869463+79399380740\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(112285869463+79399380740\sqrt{2})}}((1235163+872375\sqrt{2})x+362788\sqrt{2}+509587)}}{\sqrt{2x^2-x+3}}\right)}{169136}$$

$$+ \frac{\sqrt{\frac{1}{682}(79399380740\sqrt{2}-112285869463)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(79399380740\sqrt{2}-112285869463)}}((1235163-872375\sqrt{2})x-362788\sqrt{2}+509587)}}{\sqrt{2x^2-x+3}}\right)}{169136}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2)^3, x]

[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(62*(2 + 3*x + 5*x^2)^2) + ((3464 + 13665*x)*Sqrt[3 - x + 2*x^2])/(84568*(2 + 3*x + 5*x^2)) + (Sqrt[

```
rt[(112285869463 + 79399380740*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*
(112285869463 + 79399380740*Sqrt[2]))]*(509587 + 362788*Sqrt[2] +
(1235163 + 872375*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]]/169136 - (S
qrt[(-112285869463 + 79399380740*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(
31*(-112285869463 + 79399380740*Sqrt[2]))]*(509587 - 362788*Sqrt[
2] + (1235163 - 872375*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]]/169136
```

Rubi in Sympy [A] time = 104.314, size = 252, normalized size = 1.13

$$\frac{(10x + 3)\sqrt{2x^2 - x + 3}}{62(5x^2 + 3x + 2)^2} + \frac{\left(\frac{150315x}{2} + 19052\right)\sqrt{2x^2 - x + 3}}{465124(5x^2 + 3x + 2)}$$

$$+ \frac{\sqrt{682}\left(\frac{61660027}{4} + 10974337\sqrt{2}\right)\left(4686088\sqrt{2} + \frac{13317381}{2}\right)\operatorname{atan}\left(\frac{4\sqrt{341}\left(x\left(\frac{105557375\sqrt{2}}{4} + \frac{149454723}{4}\right) + \frac{61660027}{4} + 10974337\sqrt{2}\right)}{3751\sqrt{112285869463 + 79399380740\sqrt{2}\sqrt{2x^2 - x + 3}}}\right)}{211106295004\sqrt{112285869463 + 79399380740\sqrt{2}}}$$

$$+ \frac{\sqrt{682}\left(-10974337\sqrt{2} + \frac{61660027}{4}\right)\left(-4686088\sqrt{2} + \frac{13317381}{2}\right)\operatorname{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{105557375\sqrt{2}}{4} + \frac{149454723}{4}\right) - 10974337\sqrt{2} + \frac{61660027}{4}\right)}{3751\sqrt{-112285869463 + 79399380740\sqrt{2}\sqrt{2x^2 - x + 3}}}\right)}{211106295004\sqrt{-112285869463 + 79399380740\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (10*x + 3)*sqrt(2*x**2 - x + 3)/(62*(5*x**2 + 3*x + 2)**2) + (150
315*x/2 + 19052)*sqrt(2*x**2 - x + 3)/(465124*(5*x**2 + 3*x + 2))
+ sqrt(682)*(61660027/4 + 10974337*sqrt(2))*(4686088*sqrt(2) + 1
3317381/2)*atan(4*sqrt(341)*(x*(105557375*sqrt(2)/4 + 149454723/4
) + 61660027/4 + 10974337*sqrt(2))/(3751*sqrt(112285869463 + 7939
9380740*sqrt(2))*sqrt(2*x**2 - x + 3)))/(211106295004*sqrt(112285
869463 + 79399380740*sqrt(2))) + sqrt(682)*(-10974337*sqrt(2) + 6
1660027/4)*(-4686088*sqrt(2) + 13317381/2)*atanh(4*sqrt(341)*(x*(
-105557375*sqrt(2)/4 + 149454723/4) - 10974337*sqrt(2) + 61660027
/4)/(3751*sqrt(-112285869463 + 79399380740*sqrt(2))*sqrt(2*x**2 -
x + 3)))/(211106295004*sqrt(-112285869463 + 79399380740*sqrt(2))
)
```

```

5*I)*Sqrt[31]*x^4 - (158798761480*I)*Sqrt[682*(13 + I*Sqrt[31])]
Sqrt[3 - x + 2*x^2] + (396996903700*I)*Sqrt[682*(13 + I*Sqrt[31])
]*x*Sqrt[3 - x + 2*x^2] + (555795665180*I)*Sqrt[682*(13 + I*Sqrt[
31])]x^2*Sqrt[3 - x + 2*x^2] + (1587987614800*I)*Sqrt[682*(13 +
I*Sqrt[31])]x^3*Sqrt[3 - x + 2*x^2]]/Sqrt[682*(13 + I*Sqrt[31]
)] - (((5*I)/169136)*(174475*I + 6521*Sqrt[31])*ArcTanh[(-3188658
4896738*I - 6160809644426*Sqrt[31] - (173254405285214*I)*x + 1355
3199916122*Sqrt[31]*x - (18159288904922*I)*x^2 + 36221356993731*S
qrt[31]*x^2 - (103190181962890*I)*x^3 + 13468529326720*Sqrt[31]*x
^3 - (38797325297500*I)*x^4 + 32372991877825*Sqrt[31]*x^4 - 10004
321973240*Sqrt[22*(-13 + I*Sqrt[31])]Sqrt[3 - x + 2*x^2] - 11512
910207300*Sqrt[22*(-13 + I*Sqrt[31])]x*Sqrt[3 - x + 2*x^2] - 197
70445804260*Sqrt[22*(-13 + I*Sqrt[31])]x^2*Sqrt[3 - x + 2*x^2] +
8733931881400*Sqrt[22*(-13 + I*Sqrt[31])]x^3*Sqrt[3 - x + 2*x^2
])/((293442889929478*I + 19258356294606*Sqrt[31] + (35004166143799
4*I)*x + 6524789895338*Sqrt[31]*x + (394738353028687*I)*x^2 + 106
99230872374*Sqrt[31]*x^2 - (366664166073320*I)*x^3 + 790446999331
0*Sqrt[31]*x^3 + (153820084388525*I)*x^4 + 1450049338100*Sqrt[31]
*x^4))/Sqrt[682*(-13 + I*Sqrt[31])] - (5*(-174475*I + 6521*Sqrt[
31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*
x)^2])/(338272*Sqrt[682*(13 + I*Sqrt[31])]) + (((5*I)/338272)*(17
4475*I + 6521*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I +
Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[31])] - (((5*I)/
338272)*(174475*I + 6521*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I
+ 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt
[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]Sqrt[3 - x + 2*x^2] - (
4*I)*Sqrt[682*(-13 + I*Sqrt[31])]x*Sqrt[3 - x + 2*x^2]))/Sqrt[6
82*(-13 + I*Sqrt[31])] + (5*(-174475*I + 6521*Sqrt[31])*Log[(2 +
3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x
- (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31]
)]]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]x*Sqrt
[3 - x + 2*x^2]))/(338272*Sqrt[682*(13 + I*Sqrt[31])])

```

Maple [B] time = 0.401, size = 43932, normalized size = 197.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)^(1/2)/(5*x^2+3*x+2)^3,x)`

[Out] result too large to display

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3, x)
```

Fricas [A] time = 0.374415, size = 1646, normalized size = 7.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] 1/387269780651700194040320*sqrt(39699690370)*930248^(3/4)*sqrt(31)
)* (4*sqrt(39699690370)*930248^(1/4)*sqrt(31)*(10849925378121000*x
^3 + 9260349775706200*x^2 - 112285869463*sqrt(2)*(68325*x^3 + 583
15*x^2 + 51362*x + 11020) + 8156221987135760*x + 1749962351509600
)*sqrt(2*x^2 - x + 3)*sqrt((112285869463*sqrt(2) - 158798761480)/
(17830857002429352685240*sqrt(2) - 25216639804852841803569)) - 14
205421276*sqrt(19849845185)*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 1
2*x + 4)*arctan(615345200735*(sqrt(39699690370)*930248^(1/4)*(112
285869463*sqrt(2)*(x - 6) - 158798761480*x + 952792568880)*sqrt((
112285869463*sqrt(2) - 158798761480)/(17830857002429352685240*sq
rt(2) - 25216639804852841803569)) + 88*sqrt(19849845185)*sqrt(2*x^
2 - x + 3)*(362788*sqrt(2) - 509587))/(2*sqrt(39699690370)*sqrt(1
9849845185)*930248^(1/4)*sqrt(31)*(112285869463*sqrt(2)*x - 15879
8761480*x)*sqrt(-sqrt(2)*(23*sqrt(39699690370)*sqrt(19849845185)*
930248^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1938810595429719147626
80500544591271657*x + 80308164349964553475021076455894155685) - 2
74189223892936468237701577000485427342*x - 1135728951930073612876
59424088697115972)*sqrt((112285869463*sqrt(2) - 158798761480)/(17
830857002429352685240*sqrt(2) - 25216639804852841803569)) + 27978
898313001090717344418964781724346768361600*x^2 + 19849845185*sqrt
(2)*(392425208930440881841647027891343640*x^2 - 56629903335359625
46294362498068647*sqrt(2)*(49*x^2 - 151*x + 200) - 12093103377244
19860369157167583528360*x + 1601735546654860742210804195474872000
) - 9892034363625952575303331210194060391812493160*sqrt(2)*(2*x^2
- x + 3) - 13989449156500545358672209482390862173384180800*x + 4
1968347469501636076016628447172586520152542400)/(5662990333535962
546294362498068647*sqrt(2)*x^2 - 80086777332743037110540209773743
60*x^2)*sqrt((112285869463*sqrt(2) - 158798761480)/(178308570024
29352685240*sqrt(2) - 25216639804852841803569)) + 19849845185*sq
rt(39699690370)*930248^(1/4)*sqrt(31)*(112285869463*sqrt(2)*(19*x
- 22) - 3017176468120*x + 3493572752560)*sqrt((112285869463*sqrt(
2) - 158798761480)/(17830857002429352685240*sqrt(2) - 25216639804
852841803569)) - 54150377664680*sqrt(19849845185)*sqrt(31)*sqrt(2
*x^2 - x + 3)*(77456*sqrt(2) - 110061))) - 14205421276*sqrt(19849
845185)*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-615
```

$$\begin{aligned}
& 345200735 * (\text{sqrt}(39699690370) * 930248^{(1/4)} * (112285869463 * \text{sqrt}(2) * (\\
& x - 6) - 158798761480 * x + 952792568880) * \text{sqrt}((112285869463 * \text{sqrt}(2) \\
&) - 158798761480) / (17830857002429352685240 * \text{sqrt}(2) - 252166398048 \\
& 52841803569)) - 88 * \text{sqrt}(19849845185) * \text{sqrt}(2 * x^2 - x + 3) * (362788 * \\
& \text{sqrt}(2) - 509587)) / (2 * \text{sqrt}(39699690370) * \text{sqrt}(19849845185) * 930248^{(1/4)} * \text{sqrt}(31) * (112285869463 * \text{sqrt}(2) * x - 158798761480 * x) * \text{sqrt}(\text{sqrt}(2) * (23 * \text{sqrt}(39699690370) * \text{sqrt}(19849845185) * 930248^{(1/4)} * \text{sqrt}(2 * x^2 - x + 3) * (\text{sqrt}(2) * (193881059542971914762680500544591271657 * x + 80308164349964553475021076455894155685) - 274189223892936468237701577000485427342 * x - 113572895193007361287659424088697115972) * \text{sqrt}((112285869463 * \text{sqrt}(2) - 158798761480) / (17830857002429352685240 * \text{sqrt}(2) - 25216639804852841803569)) - 27978898313001090717344418964781724346768361600 * x^2 - 19849845185 * \text{sqrt}(2) * (392425208930440881841647027891343640 * x^2 - 5662990333535962546294362498068647 * \text{sqrt}(2) * (49 * x^2 - 151 * x + 200) - 1209310337724419860369157167583528360 * x + 1601735546654860742210804195474872000) + 9892034363625952575303331210194060391812493160 * \text{sqrt}(2) * (2 * x^2 - x + 3) + 13989449156500545358672209482390862173384180800 * x - 41968347469501636076016628447172586520152542400) / (5662990333535962546294362498068647 * \text{sqrt}(2) * x^2 - 8008677733274303711054020977374360 * x^2)) * \text{sqrt}((112285869463 * \text{sqrt}(2) - 158798761480) / (17830857002429352685240 * \text{sqrt}(2) - 25216639804852841803569)) + 19849845185 * \text{sqrt}(39699690370) * 930248^{(1/4)} * \text{sqrt}(31) * (112285869463 * \text{sqrt}(2) * (19 * x - 22) - 3017176468120 * x + 3493572752560) * \text{sqrt}((112285869463 * \text{sqrt}(2) - 158798761480) / (17830857002429352685240 * \text{sqrt}(2) - 25216639804852841803569)) + 54150377664680 * \text{sqrt}(19849845185) * \text{sqrt}(31) * \text{sqrt}(2 * x^2 - x + 3) * (77456 * \text{sqrt}(2) - 110061))) + \text{sqrt}(19849845185) * \text{sqrt}(31) * (3969969037000 * x^4 + 4763962844400 * x^3 + 4605164082920 * x^2 - 112285869463 * \text{sqrt}(2) * (25 * x^4 + 30 * x^3 + 29 * x^2 + 12 * x + 4) + 1905585137760 * x + 635195045920) * \log(-79399380740 * \text{sqrt}(2) * (23 * \text{sqrt}(39699690370) * \text{sqrt}(19849845185) * 930248^{(1/4)} * \text{sqrt}(2 * x^2 - x + 3) * (\text{sqrt}(2) * (193881059542971914762680500544591271657 * x + 80308164349964553475021076455894155685) - 274189223892936468237701577000485427342 * x - 113572895193007361287659424088697115972) * \text{sqrt}((112285869463 * \text{sqrt}(2) - 158798761480) / (17830857002429352685240 * \text{sqrt}(2) - 25216639804852841803569)) + 27978898313001090717344418964781724346768361600 * x^2 + 19849845185 * \text{sqrt}(2) * (392425208930440881841647027891343640 * x^2 - 5662990333535962546294362498068647 * \text{sqrt}(2) * (49 * x^2 - 151 * x + 200) - 1209310337724419860369157167583528360 * x + 1601735546654860742210804195474872000) - 9892034363625952575303331210194060391812493160 * \text{sqrt}(2) * (2 * x^2 - x + 3) - 13989449156500545358672209482390862173384180800 * x + 41968347469501636076016628447172586520152542400) / (5662990333535962546294362498068647 * \text{sqrt}(2) * x^2 - 8008677733274303711054020977374360 * x^2)) - \text{sqrt}(19849845185) * \text{sqrt}(31) * (3969969037000 * x^4 + 4763962844400 * x^3 + 4605164082920 * x^2 - 112285869463 * \text{sqrt}(2) * (25 * x^4 + 30 * x^3 + 29 * x^2 + 12 * x + 4) + 1905585137760 * x + 635195045920) * \log(79399380740 * \text{sqrt}(2) * (23 * \text{sqrt}(39699690370) * \text{sqrt}(19849845185) * 930248^{(1/4)} * \text{sqrt}(2 * x^2 - x + 3) * (\text{sqrt}(2) * (193881059542971914762680500544591271657 * x + 80308164349964553475021076455894155685) - 274189223892936468237701577000485427342 * x - 113572895193007361287659424088697115972) * \text{sqrt}((112285869463 * \text{sqrt}(2) - 158798761480) / (17830857002429352685240 * \text{sqrt}(2) - 25216639804852841803569)) - 27978898313001090717344418964781724346768361600 * x^2 - 19849845185 * \text{sqrt}(2) * (392425208930440881841647027891343640 * x^2 - 566299033353
\end{aligned}$$


```

5962546294362498068647*sqrt(2)*(49*x^2 - 151*x + 200) - 120931033
7724419860369157167583528360*x + 16017355466548607422108041954748
72000) + 9892034363625952575303331210194060391812493160*sqrt(2)*(
2*x^2 - x + 3) + 13989449156500545358672209482390862173384180800*
x - 41968347469501636076016628447172586520152542400)/(56629903335
35962546294362498068647*sqrt(2)*x^2 - 800867773327430371105402097
7374360*x^2))/((3969969037000*x^4 + 4763962844400*x^3 + 46051640
82920*x^2 - 112285869463*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x
+ 4) + 1905585137760*x + 635195045920)*sqrt((112285869463*sqrt(2)
) - 158798761480)/(17830857002429352685240*sqrt(2) - 252166398048
52841803569)))

```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**3,x)

[Out] Integral(sqrt(2*x**2 - x + 3)/(5*x**2 + 3*x + 2)**3, x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")

[Out] Exception raised: RuntimeError

$$3.65 \quad \int (3 - x + 2x^2)^{3/2} (2 + 3x + 5x^2)^4 dx$$

Optimal. Leaf size=231

$$\begin{aligned} & -\frac{56422489(2x^2-x+3)^{5/2}x^2}{8257536} + \frac{48669967(2x^2-x+3)^{5/2}x}{22020096} + \frac{2124689283(2x^2-x+3)^{5/2}}{146800640} \\ & -\frac{382121949(1-4x)(2x^2-x+3)^{3/2}}{134217728} - \frac{26366414481(1-4x)\sqrt{2x^2-x+3}}{2147483648} \\ & + \frac{625}{24}(2x^2-x+3)^{5/2}x^7 + \frac{7625}{96}(2x^2-x+3)^{5/2}x^6 + \frac{95165}{768}(2x^2-x+3)^{5/2}x^5 + \frac{941905(2x^2-x+3)^{5/2}x^4}{9216} + \frac{10444117(2x^2-x+3)^{5/2}}{294912} \end{aligned}$$

[Out] $(-26366414481*(1-4*x)*\text{Sqrt}[3-x+2*x^2])/2147483648 - (382121949*(1-4*x)*(3-x+2*x^2)^{(3/2)})/134217728 + (2124689283*(3-x+2*x^2)^{(5/2)})/146800640 + (48669967*x*(3-x+2*x^2)^{(5/2)})/22020096 - (56422489*x^2*(3-x+2*x^2)^{(5/2)})/8257536 + (10444117*x^3*(3-x+2*x^2)^{(5/2)})/294912 + (941905*x^4*(3-x+2*x^2)^{(5/2)})/9216 + (95165*x^5*(3-x+2*x^2)^{(5/2)})/768 + (7625*x^6*(3-x+2*x^2)^{(5/2)})/96 + (625*x^7*(3-x+2*x^2)^{(5/2)})/24 - (606427533063*\text{ArcSinh}[(1-4*x)/\text{Sqrt}[23]])/(4294967296*\text{Sqrt}[2])$

Rubi [A] time = 0.538663, antiderivative size = 231, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & -\frac{56422489(2x^2-x+3)^{5/2}x^2}{8257536} + \frac{48669967(2x^2-x+3)^{5/2}x}{22020096} + \frac{2124689283(2x^2-x+3)^{5/2}}{146800640} \\ & -\frac{382121949(1-4x)(2x^2-x+3)^{3/2}}{134217728} - \frac{26366414481(1-4x)\sqrt{2x^2-x+3}}{2147483648} \\ & + \frac{625}{24}(2x^2-x+3)^{5/2}x^7 + \frac{7625}{96}(2x^2-x+3)^{5/2}x^6 + \frac{95165}{768}(2x^2-x+3)^{5/2}x^5 + \frac{941905(2x^2-x+3)^{5/2}x^4}{9216} + \frac{10444117(2x^2-x+3)^{5/2}}{294912} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3-x+2*x^2)^{(3/2)}*(2+3*x+5*x^2)^4, x]$

[Out] $(-26366414481*(1-4*x)*\text{Sqrt}[3-x+2*x^2])/2147483648 - (382121949*(1-4*x)*(3-x+2*x^2)^{(3/2)})/134217728 + (2124689283*(3-x+2*x^2)^{(5/2)})/146800640 + (48669967*x*(3-x+2*x^2)^{(5/2)})/22020096 - (56422489*x^2*(3-x+2*x^2)^{(5/2)})/8257536 + (10444117*x^3*(3-x+2*x^2)^{(5/2)})/294912 + (941905*x^4*(3-x+2*x^2)^{(5/2)})/9216 + (95165*x^5*(3-x+2*x^2)^{(5/2)})/768 + (7625*x^6*(3-x+2*x^2)^{(5/2)})/96 + (625*x^7*(3-x+2*x^2)^{(5/2)})/24 - (606427533063*\text{ArcSinh}[(1-4*x)/\text{Sqrt}[23]])/(4294967296*\text{Sqrt}[2])$

Rubi in Sympy [A] time = 127.504, size = 226, normalized size = 0.98

$$\begin{aligned}
& \frac{\left(-\frac{21379503915x}{8} + \frac{126950071545}{32}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^3}{6652800000} \\
& - \frac{\left(-\frac{451935x}{2} + \frac{8762457}{8}\right) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^3}{2376000} + \frac{(110x + \frac{275}{2}) (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^3}{528} \\
& + \frac{\left(\frac{219498174484875x}{32} + \frac{282329758130805}{128}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2}{399168000000} \\
& + \frac{\left(\frac{248326213547973825x}{128} + \frac{2095081800537234465}{512}\right) \left(-\frac{16555080903198255x^2}{256} - \frac{36050504278588965x}{256} + \frac{8081700197787315}{128}\right) \sqrt{2x^2 - x + 3}}{12390484751189701972200000000} \\
& + \frac{\left(\frac{227190025067637992913833407501064625x}{131072} + \frac{4337543215706889938219119518682614075}{524288}\right) \sqrt{2x^2 - x + 3}}{99123878009517615777600000000} \\
& + \frac{606427533063\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8589934592}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**4,x)`

[Out] $\begin{aligned}
& -\left(-21379503915x/8 + 126950071545/32\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^3 / 6652800000 - \left(-451935x/2 + 8762457/8\right) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^3 / 2376000 + (110x + 275/2) (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^3 / 528 + (219498174484875x/32 + 282329758130805/128) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2 / 399168000000 + (248326213547973825x/128 + 2095081800537234465/512) \left(-16555080903198255x^2/256 - 36050504278588965x/256 + 8081700197787315/128\right) \sqrt{2x^2 - x + 3} / 12390484751189701972200000000 + (227190025067637992913833407501064625x/131072 + 4337543215706889938219119518682614075/524288) \sqrt{2x^2 - x + 3} / 99123878009517615777600000000 + 606427533063 \sqrt{2} \operatorname{atanh}\left(\sqrt{2} (4x-1) / (4 \sqrt{2x^2-x+3})\right) / 8589934592
\end{aligned}$

Mathematica [A] time = 0.132113, size = 95, normalized size = 0.41

$$191024672914845\sqrt{2} \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right) + 4\sqrt{2x^2 - x + 3} (70464307200000x^{11} + 144451829760000x^{10} + 349379651174400x^9 + \dots)$$

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^4,x]`

[Out] $(4*\text{Sqrt}[3 - x + 2*x^2])*(74032009514181 + 12971175524316*x + 65151998063712*x^2 + 239021184223104*x^3 + 451581382260736*x^4 + 675479464714240*x^5 + 765087080448000*x^6 + 745133229998080*x^7 + 534038708224000*x^8 + 349379651174400*x^9 + 144451829760000*x^{10} + 70464307200000*x^{11}) + 191024672914845*\text{Sqrt}[2]*\text{ArcSinh}[(-1 + 4*x)/\text{Sqrt}[23]]/2705829396480$

Maple [A] time = 0.046, size = 185, normalized size = 0.8

$$\begin{aligned} & \frac{1528487796x - 382121949}{134217728} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{105465657924x - 26366414481}{2147483648} \sqrt{2x^2 - x + 3} \\ & + \frac{606427533063\sqrt{2}}{8589934592} \text{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{2124689283}{146800640} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{48669967x}{22020096} (2x^2 - x + 3)^{\frac{5}{2}} - \frac{56422489x^2}{8257536} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{10444117x^3}{294912} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{941905x^4}{9216} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{95165x^5}{768} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{7625x^6}{96} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{625x^7}{24} (2x^2 - x + 3)^{\frac{5}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2*x^2-x+3)^{(3/2)}*(5*x^2+3*x+2)^4, x)$

[Out] $382121949/134217728*(4*x-1)*(2*x^2-x+3)^{(3/2)}+26366414481/2147483648*(4*x-1)*(2*x^2-x+3)^{(1/2)}+606427533063/8589934592*2^{(1/2)}*\text{arc sinh}(4/23*23^{(1/2)}*(x-1/4))+2124689283/146800640*(2*x^2-x+3)^{(5/2)}+48669967/22020096*x*(2*x^2-x+3)^{(5/2)}-56422489/8257536*x^2*(2*x^2-x+3)^{(5/2)}+10444117/294912*x^3*(2*x^2-x+3)^{(5/2)}+941905/9216*x^4*(2*x^2-x+3)^{(5/2)}+95165/768*x^5*(2*x^2-x+3)^{(5/2)}+7625/96*x^6*(2*x^2-x+3)^{(5/2)}+625/24*x^7*(2*x^2-x+3)^{(5/2)}$

Maxima [A] time = 0.779083, size = 278, normalized size = 1.2

$$\begin{aligned} & \frac{625}{24} (2x^2 - x + 3)^{\frac{5}{2}} x^7 + \frac{7625}{96} (2x^2 - x + 3)^{\frac{5}{2}} x^6 + \frac{95165}{768} (2x^2 - x + 3)^{\frac{5}{2}} x^5 \\ & + \frac{941905}{9216} (2x^2 - x + 3)^{\frac{5}{2}} x^4 + \frac{10444117}{294912} (2x^2 - x + 3)^{\frac{5}{2}} x^3 - \frac{56422489}{8257536} (2x^2 - x + 3)^{\frac{5}{2}} x^2 \\ & + \frac{48669967}{22020096} (2x^2 - x + 3)^{\frac{5}{2}} x + \frac{2124689283}{146800640} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{382121949}{33554432} (2x^2 - x + 3)^{\frac{3}{2}} x \\ & - \frac{382121949}{134217728} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{26366414481}{536870912} \sqrt{2x^2 - x + 3x} \\ & + \frac{606427533063}{8589934592} \sqrt{2} \text{arsinh}\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) - \frac{26366414481}{2147483648} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")`

[Out] $625/24*(2*x^2 - x + 3)^{(5/2)}*x^7 + 7625/96*(2*x^2 - x + 3)^{(5/2)}*x^6 + 95165/768*(2*x^2 - x + 3)^{(5/2)}*x^5 + 941905/9216*(2*x^2 - x + 3)^{(5/2)}*x^4 + 10444117/294912*(2*x^2 - x + 3)^{(5/2)}*x^3 - 56422489/8257536*(2*x^2 - x + 3)^{(5/2)}*x^2 + 48669967/22020096*(2*x^2 - x + 3)^{(5/2)}*x + 2124689283/146800640*(2*x^2 - x + 3)^{(5/2)} + 382121949/33554432*(2*x^2 - x + 3)^{(3/2)}*x - 382121949/134217728*(2*x^2 - x + 3)^{(3/2)} + 26366414481/536870912*\sqrt{2*x^2 - x + 3} + 606427533063/8589934592*\sqrt{2}*\operatorname{arcsinh}(1/23*\sqrt{23}*(4*x - 1)) - 26366414481/2147483648*\sqrt{2*x^2 - x + 3}$

Fricas [A] time = 0.285715, size = 157, normalized size = 0.68

$$\frac{1}{5411658792960} \sqrt{2} \left(4 \sqrt{2} (70464307200000 x^{11} + 144451829760000 x^{10} + 349379651174400 x^9 + 534038708224000 x^8 + 74513229998080 x^7 + 765087080448000 x^6 + 675479464714240 x^5 + 451581382260736 x^4 + 239021184223104 x^3 + 65151998063712 x^2 + 12971175524316 x + 74032009514181) \sqrt{2*x^2 - x + 3} + 191024672914845 \log(-\sqrt{2}*(32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")`

[Out] $1/5411658792960*\sqrt{2}*(4*\sqrt{2}*(70464307200000*x^{11} + 144451829760000*x^{10} + 349379651174400*x^9 + 534038708224000*x^8 + 74513229998080*x^7 + 765087080448000*x^6 + 675479464714240*x^5 + 451581382260736*x^4 + 239021184223104*x^3 + 65151998063712*x^2 + 12971175524316*x + 74032009514181)*\sqrt{2*x^2 - x + 3} + 191024672914845*\log(-\sqrt{2}*(32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)))$

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

$$\int (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^4 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**4,x)`

[Out] `Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**4, x)`

GIAC/XCAS [A] time = 0.271196, size = 139, normalized size = 0.6

$$\frac{1}{676457349120} (4 (8 (4 (16 (20 (8 (28 (160 (12 (200 (20 x + 41)x + 19833)x + 363785)x + 81213077)x + 2334860475)x + 16491197869)x + 220498721807)x + 1867353001743)x + 2035999939491)x + 3242793881079)x + 74032009514181) \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2} x - \sqrt{2 x^2 - x + 3} \right) + 1 \right) - \frac{60642753063}{8589934592} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2} x - \sqrt{2 x^2 - x + 3} \right) + 1 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")

[Out] 1/676457349120*(4*(8*(4*(16*(20*(8*(28*(160*(12*(200*(20*x + 41)*x + 19833)*x + 363785)*x + 81213077)*x + 2334860475)*x + 16491197869)*x + 220498721807)*x + 1867353001743)*x + 2035999939491)*x + 3242793881079)*x + 74032009514181)*sqrt(2*x^2 - x + 3) - 60642753063/8589934592*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.66 \quad \int (3 - x + 2x^2)^{3/2} (2 + 3x + 5x^2)^3 dx$$

Optimal. Leaf size=189

$$\frac{384739(2x^2 - x + 3)^{5/2}x^2}{43008} - \frac{81685(2x^2 - x + 3)^{5/2}x}{114688} - \frac{4625907(2x^2 - x + 3)^{5/2}}{2293760}$$

$$- \frac{667795(1 - 4x)(2x^2 - x + 3)^{3/2}}{2097152} - \frac{46077855(1 - 4x)\sqrt{2x^2 - x + 3}}{33554432}$$

$$+ \frac{25}{4}(2x^2 - x + 3)^{5/2}x^5 + \frac{725}{48}(2x^2 - x + 3)^{5/2}x^4 + \frac{27785(2x^2 - x + 3)^{5/2}x^3}{1536} - \frac{1059790665 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{67108864\sqrt{2}}$$

[Out] $(-46077855*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/33554432 - (667795*(1 - 4*x)*(3 - x + 2*x^2)^{(3/2)})/2097152 - (4625907*(3 - x + 2*x^2)^{(5/2)})/2293760 - (81685*x*(3 - x + 2*x^2)^{(5/2)})/114688 + (384739*x^2*(3 - x + 2*x^2)^{(5/2)})/43008 + (27785*x^3*(3 - x + 2*x^2)^{(5/2)})/1536 + (725*x^4*(3 - x + 2*x^2)^{(5/2)})/48 + (25*x^5*(3 - x + 2*x^2)^{(5/2)})/4 - (1059790665*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(67108864*\text{Sqrt}[2])$

Rubi [A] time = 0.31363, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{384739(2x^2 - x + 3)^{5/2}x^2}{43008} - \frac{81685(2x^2 - x + 3)^{5/2}x}{114688} - \frac{4625907(2x^2 - x + 3)^{5/2}}{2293760}$$

$$- \frac{667795(1 - 4x)(2x^2 - x + 3)^{3/2}}{2097152} - \frac{46077855(1 - 4x)\sqrt{2x^2 - x + 3}}{33554432}$$

$$+ \frac{25}{4}(2x^2 - x + 3)^{5/2}x^5 + \frac{725}{48}(2x^2 - x + 3)^{5/2}x^4 + \frac{27785(2x^2 - x + 3)^{5/2}x^3}{1536} - \frac{1059790665 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{67108864\sqrt{2}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3 - x + 2*x^2)^{(3/2)}*(2 + 3*x + 5*x^2)^3, x]$

[Out] $(-46077855*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/33554432 - (667795*(1 - 4*x)*(3 - x + 2*x^2)^{(3/2)})/2097152 - (4625907*(3 - x + 2*x^2)^{(5/2)})/2293760 - (81685*x*(3 - x + 2*x^2)^{(5/2)})/114688 + (384739*x^2*(3 - x + 2*x^2)^{(5/2)})/43008 + (27785*x^3*(3 - x + 2*x^2)^{(5/2)})/1536 + (725*x^4*(3 - x + 2*x^2)^{(5/2)})/48 + (25*x^5*(3 - x + 2*x^2)^{(5/2)})/4 - (1059790665*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(67108864*\text{Sqrt}[2])$

Rubi in Sympy [A] time = 96.9671, size = 201, normalized size = 1.06

$$\begin{aligned}
 & 32 \left(-\frac{162474157526316622978033338525x}{8192} + \frac{303537532424394352210249465395}{32768} \right) \sqrt{2x^2 - x + 3} \left(\frac{194050502594980298595x^2}{1024} - \frac{39088192706870460075x}{1024} \right. \\
 & \left. - \frac{5356417031858863054634751704213813807578125}{1008000} + \frac{360}{1008000} \right) \\
 & + \frac{\left(\frac{6977314125x}{8} + \frac{35164168335}{32} \right) \sqrt{2x^2 - x + 3} \left(\frac{279092565x^2}{16} - \frac{205812081x}{16} + \frac{14206635}{8} \right)^2}{18402140886793466906250} \\
 & - \frac{4 \left(\frac{1266161437051083776619266308303527744115784816975625x}{33554432} + \frac{2787236768504426756518680483616037764540168023447075}{134217728} \right) \sqrt{2x^2 - x + 3}}{5356417031858863054634751704213813807578125} \\
 & + \frac{1059790665\sqrt{2} \operatorname{atanh} \left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}} \right)}{134217728}
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**3,x)`

[Out] `-32*(-162474157526316622978033338525*x/8192 + 303537532424394352210249465395/32768)*sqrt(2*x**2 - x + 3)*(194050502594980298595*x**2/1024 - 39088192706870460075*x/1024 + 97626563836837610535/512)/5356417031858863054634751704213813807578125 - (-276465*x/2 + 3734733/8)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2/1008000 + (90*x + 219/2)*(2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2/360 + (6977314125*x/8 + 35164168335/32)*sqrt(2*x**2 - x + 3)*(279092565*x**2/16 - 205812081*x/16 + 14206635/8)**2/18402140886793466906250 - 4*(1266161437051083776619266308303527744115784816975625*x/33554432 + 2787236768504426756518680483616037764540168023447075/134217728)*sqrt(2*x**2 - x + 3)/5356417031858863054634751704213813807578125 + 1059790665*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/134217728`

Mathematica [A] time = 0.10956, size = 85, normalized size = 0.45

$$\frac{4\sqrt{2x^2 - x + 3} (88080384000x^9 + 124780544000x^8 + 328328806400x^7 + 430820229120x^6 + 571298324480x^5 + 487891884032x^4 + 430820229120x^3 + 328328806400x^2 + 124780544000x + 88080384)}{14092861440}$$

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3,x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(-72152399943 + 53985432012*x + 199615064544*x^2 + 389257196928*x^3 + 487891884032*x^4 + 571298324480*x^5 + 430820229120*x^6 + 328328806400*x^7 + 124780544000*x^8 + 88080384))`

4000*x^9) + 111278019825*sqrt[2]*ArcSinh[(-1 + 4*x)/sqrt[23]]/14
092861440

Maple [A] time = 0.01, size = 151, normalized size = 0.8

$$\begin{aligned} & \frac{2671180x - 667795}{2097152} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{184311420x - 46077855}{33554432} \sqrt{2x^2 - x + 3} \\ & + \frac{1059790665\sqrt{2}}{134217728} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) - \frac{4625907}{2293760} (2x^2 - x + 3)^{\frac{5}{2}} \\ & - \frac{81685x}{114688} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{384739x^2}{43008} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{27785x^3}{1536} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{725x^4}{48} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{25x^5}{4} (2x^2 - x + 3)^{\frac{5}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2)^3,x)

[Out] 667795/2097152*(4*x-1)*(2*x^2-x+3)^(3/2)+46077855/33554432*(4*x-1)
)*(2*x^2-x+3)^(1/2)+1059790665/134217728*2^(1/2)*arcsinh(4/23*23^
(1/2)*(x-1/4))-4625907/2293760*(2*x^2-x+3)^(5/2)-81685/114688*x*(
2*x^2-x+3)^(5/2)+384739/43008*x^2*(2*x^2-x+3)^(5/2)+27785/1536*x^
3*(2*x^2-x+3)^(5/2)+725/48*x^4*(2*x^2-x+3)^(5/2)+25/4*x^5*(2*x^2-
x+3)^(5/2)

Maxima [A] time = 0.770314, size = 232, normalized size = 1.23

$$\begin{aligned} & \frac{25}{4} (2x^2 - x + 3)^{\frac{5}{2}} x^5 + \frac{725}{48} (2x^2 - x + 3)^{\frac{5}{2}} x^4 + \frac{27785}{1536} (2x^2 - x + 3)^{\frac{5}{2}} x^3 \\ & + \frac{384739}{43008} (2x^2 - x + 3)^{\frac{5}{2}} x^2 - \frac{81685}{114688} (2x^2 - x + 3)^{\frac{5}{2}} x - \frac{4625907}{2293760} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{667795}{524288} (2x^2 - x + 3)^{\frac{3}{2}} x - \frac{667795}{2097152} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{46077855}{8388608} \sqrt{2x^2 - x + 3} x \\ & + \frac{1059790665}{134217728} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{46077855}{33554432} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")

[Out] 25/4*(2*x^2 - x + 3)^(5/2)*x^5 + 725/48*(2*x^2 - x + 3)^(5/2)*x^4
+ 27785/1536*(2*x^2 - x + 3)^(5/2)*x^3 + 384739/43008*(2*x^2 - x
+ 3)^(5/2)*x^2 - 81685/114688*(2*x^2 - x + 3)^(5/2)*x - 4625907/

$$2293760*(2*x^2 - x + 3)^{(5/2)} + 667795/524288*(2*x^2 - x + 3)^{(3/2)}*x - 667795/2097152*(2*x^2 - x + 3)^{(3/2)} + 46077855/8388608*\text{sqrt}(2*x^2 - x + 3)*x + 1059790665/134217728*\text{sqrt}(2)*\text{arcsinh}(1/23*\text{sqrt}(23)*(4*x - 1)) - 46077855/33554432*\text{sqrt}(2*x^2 - x + 3)$$

Fricas [A] time = 0.287477, size = 143, normalized size = 0.76

$$\frac{1}{28185722880} \sqrt{2} \left(4 \sqrt{2} (88080384000 x^9 + 124780544000 x^8 + 328328806400 x^7 + 430820229120 x^6 + 571298324480 x^5 + 487891884032 x^4 + 389257196928 x^3 + 199615064544 x^2 + 53985432012 x - 72152399943) \sqrt{2*x^2 - x + 3} + 111278019825 \log(-\sqrt{2*x^2 - x + 3}) * (32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")

[Out] 1/28185722880*sqrt(2)*(4*sqrt(2)*(88080384000*x^9 + 124780544000*x^8 + 328328806400*x^7 + 430820229120*x^6 + 571298324480*x^5 + 487891884032*x^4 + 389257196928*x^3 + 199615064544*x^2 + 53985432012*x - 72152399943)*sqrt(2*x^2 - x + 3) + 111278019825*log(-sqrt(2*x^2 - x + 3))*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1))

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

$$\int (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**3,x)

[Out] Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**3, x)

GIAC/XCAS [A] time = 0.269215, size = 126, normalized size = 0.67

$$\frac{1}{3523215360} (4(8(4(16(20(8(140(160(12x + 17)x + 7157)x + 1314759)x + 13947713)x + 238228459)x + 3041071851)x + 61059790665)\sqrt{2}\ln(-2\sqrt{2}(\sqrt{2}x - \sqrt{2x^2 - x + 3}) + 1))$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")

```
[Out] 1/3523215360*(4*(8*(4*(16*(20*(8*(140*(160*(12*x + 17)*x + 7157)*x + 1314759)*x + 13947713)*x + 238228459)*x + 3041071851)*x + 6237970767)*x + 13496358003)*x - 72152399943)*sqrt(2*x^2 - x + 3) - 1059790665/134217728*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

$$3.67 \quad \int (3 - x + 2x^2)^{3/2} (2 + 3x + 5x^2)^2 dx$$

Optimal. Leaf size=147

$$\begin{aligned} & \frac{1235}{448} (2x^2 - x + 3)^{5/2} x^2 + \frac{24499 (2x^2 - x + 3)^{5/2} x}{10752} + \frac{73861 (2x^2 - x + 3)^{5/2}}{215040} \\ & + \frac{24293(1 - 4x) (2x^2 - x + 3)^{3/2}}{196608} + \frac{558739(1 - 4x)\sqrt{2x^2 - x + 3}}{1048576} \\ & + \frac{25}{16} (2x^2 - x + 3)^{5/2} x^3 + \frac{12850997 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2097152\sqrt{2}} \end{aligned}$$

[Out] (558739*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1048576 + (24293*(1 - 4*x) * (3 - x + 2*x^2)^(3/2))/196608 + (73861*(3 - x + 2*x^2)^(5/2))/215040 + (24499*x*(3 - x + 2*x^2)^(5/2))/10752 + (1235*x^2*(3 - x + 2*x^2)^(5/2))/448 + (25*x^3*(3 - x + 2*x^2)^(5/2))/16 + (12850997*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2097152*Sqrt[2])

Rubi [A] time = 0.198204, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{1235}{448} (2x^2 - x + 3)^{5/2} x^2 + \frac{24499 (2x^2 - x + 3)^{5/2} x}{10752} + \frac{73861 (2x^2 - x + 3)^{5/2}}{215040} \\ & + \frac{24293(1 - 4x) (2x^2 - x + 3)^{3/2}}{196608} + \frac{558739(1 - 4x)\sqrt{2x^2 - x + 3}}{1048576} \\ & + \frac{25}{16} (2x^2 - x + 3)^{5/2} x^3 + \frac{12850997 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2097152\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2,x]

[Out] (558739*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1048576 + (24293*(1 - 4*x) * (3 - x + 2*x^2)^(3/2))/196608 + (73861*(3 - x + 2*x^2)^(5/2))/215040 + (24499*x*(3 - x + 2*x^2)^(5/2))/10752 + (1235*x^2*(3 - x + 2*x^2)^(5/2))/448 + (25*x^3*(3 - x + 2*x^2)^(5/2))/16 + (12850997*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2097152*Sqrt[2])

Rubi in Sympy [A] time = 24.137, size = 126, normalized size = 0.86

$$\begin{aligned} & -\frac{\left(-\frac{30215x}{2} + \frac{82619}{8}\right) (2x^2 - x + 3)^{\frac{5}{2}}}{26880} + \frac{24293(-4x + 1) (2x^2 - x + 3)^{\frac{3}{2}}}{196608} \\ & + \frac{558739(-4x + 1) \sqrt{2x^2 - x + 3}}{1048576} + \frac{\left(70x + \frac{163}{2}\right) (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)}{224} \\ & - \frac{12850997\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4194304} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**2,x)`

[Out] `-(-30215*x/2 + 82619/8)*(2*x**2 - x + 3)**(5/2)/26880 + 24293*(-4*x + 1)*(2*x**2 - x + 3)**(3/2)/196608 + 558739*(-4*x + 1)*sqrt(2*x**2 - x + 3)/1048576 + (70*x + 163/2)*(2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)/224 - 12850997*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/4194304`

Mathematica [A] time = 0.092039, size = 75, normalized size = 0.51

$$\frac{4\sqrt{2x^2 - x + 3} (688128000x^7 + 525926400x^6 + 2025840640x^5 + 2061273088x^4 + 2728413312x^3 + 1799647136x^2 + 161940320x + 440401920)}{440401920}$$

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2,x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(439831323 + 1619403428*x + 1799647136*x^2 + 2728413312*x^3 + 2061273088*x^4 + 2025840640*x^5 + 525926400*x^6 + 688128000*x^7) - 1349354685*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/440401920`

Maple [A] time = 0.009, size = 117, normalized size = 0.8

$$\begin{aligned} & -\frac{97172x - 24293}{196608} (2x^2 - x + 3)^{\frac{3}{2}} - \frac{2234956x - 558739}{1048576} \sqrt{2x^2 - x + 3} \\ & - \frac{12850997\sqrt{2}}{4194304} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{73861}{215040} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{24499x}{10752} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{1235x^2}{448} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{25x^3}{16} (2x^2 - x + 3)^{\frac{5}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2)^2,x)`

[Out] $-24293/196608*(4*x-1)*(2*x^2-x+3)^{(3/2)}-558739/1048576*(4*x-1)*(2*x^2-x+3)^{(1/2)}-12850997/4194304*2^{(1/2)}*\operatorname{arcsinh}(4/23*23^{(1/2)}*(x-1/4))+73861/215040*(2*x^2-x+3)^{(5/2)}+24499/10752*x*(2*x^2-x+3)^{(5/2)}+1235/448*x^2*(2*x^2-x+3)^{(5/2)}+25/16*x^3*(2*x^2-x+3)^{(5/2)}$

Maxima [A] time = 0.77507, size = 186, normalized size = 1.27

$$\begin{aligned} & \frac{25}{16}(2x^2-x+3)^{\frac{5}{2}}x^3 + \frac{1235}{448}(2x^2-x+3)^{\frac{5}{2}}x^2 + \frac{24499}{10752}(2x^2-x+3)^{\frac{5}{2}}x \\ & + \frac{73861}{215040}(2x^2-x+3)^{\frac{5}{2}} - \frac{24293}{49152}(2x^2-x+3)^{\frac{3}{2}}x + \frac{24293}{196608}(2x^2-x+3)^{\frac{3}{2}} \\ & - \frac{558739}{262144}\sqrt{2x^2-x+3}x - \frac{12850997}{4194304}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{558739}{1048576}\sqrt{2x^2-x+3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2+3*x+2)^2*(2*x^2-x+3)^(3/2),x, algorithm="maxima")`

[Out] $25/16*(2*x^2-x+3)^{(5/2)}*x^3 + 1235/448*(2*x^2-x+3)^{(5/2)}*x^2 + 24499/10752*(2*x^2-x+3)^{(5/2)}*x + 73861/215040*(2*x^2-x+3)^{(5/2)} - 24293/49152*(2*x^2-x+3)^{(3/2)}*x + 24293/196608*(2*x^2-x+3)^{(3/2)} - 558739/262144*\operatorname{sqrt}(2*x^2-x+3)*x - 12850997/4194304*\operatorname{sqrt}(2)*\operatorname{arcsinh}(1/23*\operatorname{sqrt}(23)*(4*x-1)) + 558739/1048576*\operatorname{sqrt}(2*x^2-x+3)$

Fricas [A] time = 0.282343, size = 130, normalized size = 0.88

$$\frac{1}{880803840}\sqrt{2}\left(4\sqrt{2}(688128000x^7+525926400x^6+2025840640x^5+2061273088x^4+2728413312x^3+1799647136x^2+1619403428x+439831323)*\operatorname{sqrt}(2*x^2-x+3)+1349354685*\log(-\operatorname{sqrt}(2)*(32*x^2-16*x+25)+8*\operatorname{sqrt}(2*x^2-x+3)*(4*x-1))\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2+3*x+2)^2*(2*x^2-x+3)^(3/2),x, algorithm="fricas")`

[Out] $1/880803840*\operatorname{sqrt}(2)*(4*\operatorname{sqrt}(2)*(688128000*x^7+525926400*x^6+2025840640*x^5+2061273088*x^4+2728413312*x^3+1799647136*x^2+1619403428*x+439831323)*\operatorname{sqrt}(2*x^2-x+3)+1349354685*\log(-\operatorname{sqrt}(2)*(32*x^2-16*x+25)+8*\operatorname{sqrt}(2*x^2-x+3)*(4*x-1)))$

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

$$\int (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**2,x)

[Out] Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2, x)

GIAC/XCAS [A] time = 0.269531, size = 112, normalized size = 0.76

$$\frac{1}{110100480} (4(8(4(16(20(120(140x + 107)x + 49459)x + 1006481)x + 21315729)x + 56238973)x + 404850857)x + 439831323) + \frac{12850997}{4194304} \sqrt{2} \ln(-2\sqrt{2}(\sqrt{2x - \sqrt{2x^2 - x + 3}}) + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")

[Out] 1/110100480*(4*(8*(4*(16*(20*(120*(140*x + 107)*x + 49459)*x + 1006481)*x + 21315729)*x + 56238973)*x + 404850857)*x + 439831323)*sqrt(2*x^2 - x + 3) + 12850997/4194304*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.68 \quad \int (3 - x + 2x^2)^{3/2} (2 + 3x + 5x^2) dx$$

Optimal. Leaf size=105

$$\begin{aligned} & \frac{5}{12}x(2x^2 - x + 3)^{5/2} + \frac{107}{240}(2x^2 - x + 3)^{5/2} - \frac{179(1 - 4x)(2x^2 - x + 3)^{3/2}}{1536} \\ & - \frac{4117(1 - 4x)\sqrt{2x^2 - x + 3}}{8192} - \frac{94691 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16384\sqrt{2}} \end{aligned}$$

[Out] (-4117*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/8192 - (179*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/1536 + (107*(3 - x + 2*x^2)^(5/2))/240 + (5*x*(3 - x + 2*x^2)^(5/2))/12 - (94691*ArcSinh[(1 - 4*x)/Sqrt[23]])/(16384*Sqrt[2])

Rubi [A] time = 0.104106, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\begin{aligned} & \frac{5}{12}x(2x^2 - x + 3)^{5/2} + \frac{107}{240}(2x^2 - x + 3)^{5/2} - \frac{179(1 - 4x)(2x^2 - x + 3)^{3/2}}{1536} \\ & - \frac{4117(1 - 4x)\sqrt{2x^2 - x + 3}}{8192} - \frac{94691 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16384\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2), x]

[Out] (-4117*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/8192 - (179*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/1536 + (107*(3 - x + 2*x^2)^(5/2))/240 + (5*x*(3 - x + 2*x^2)^(5/2))/12 - (94691*ArcSinh[(1 - 4*x)/Sqrt[23]])/(16384*Sqrt[2])

Rubi in Sympy [A] time = 11.0901, size = 94, normalized size = 0.9

$$\begin{aligned} & -\frac{179(-4x + 1)(2x^2 - x + 3)^{\frac{3}{2}}}{1536} - \frac{4117(-4x + 1)\sqrt{2x^2 - x + 3}}{8192} \\ & + \frac{(50x + \frac{107}{2})(2x^2 - x + 3)^{\frac{5}{2}}}{120} + \frac{94691\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{32768} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2),x)`

[Out] $-179*(-4*x + 1)*(2*x**2 - x + 3)**(3/2)/1536 - 4117*(-4*x + 1)*\sqrt{2*x**2 - x + 3}/8192 + (50*x + 107/2)*(2*x**2 - x + 3)**(5/2)/120 + 94691*\sqrt{2}*\operatorname{atanh}(\sqrt{2}*(4*x - 1)/(4*\sqrt{2*x**2 - x + 3}))/32768$

Mathematica [A] time = 0.0724042, size = 65, normalized size = 0.62

$$\frac{4\sqrt{2x^2 - x + 3}(204800x^5 + 14336x^4 + 561024x^3 + 319072x^2 + 565276x + 388341) + 1420365\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{491520}$$

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2),x]`

[Out] $(4*\operatorname{Sqrt}[3 - x + 2*x^2]*(388341 + 565276*x + 319072*x^2 + 561024*x^3 + 14336*x^4 + 204800*x^5) + 1420365*\operatorname{Sqrt}[2]*\operatorname{ArcSinh}[(-1 + 4*x)/\operatorname{Sqrt}[23]])/491520$

Maple [A] time = 0.007, size = 83, normalized size = 0.8

$$\frac{716x - 179}{1536}(2x^2 - x + 3)^{\frac{3}{2}} + \frac{16468x - 4117}{8192}\sqrt{2x^2 - x + 3} + \frac{94691\sqrt{2}}{32768}\operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{107}{240}(2x^2 - x + 3)^{\frac{5}{2}} + \frac{5x}{12}(2x^2 - x + 3)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2),x)`

[Out] $179/1536*(4*x-1)*(2*x^2-x+3)^(3/2)+4117/8192*(4*x-1)*(2*x^2-x+3)^(1/2)+94691/32768*2^(1/2)*\operatorname{arcsinh}(4/23*23^(1/2)*(x-1/4))+107/240*(2*x^2-x+3)^(5/2)+5/12*x*(2*x^2-x+3)^(5/2)$

Maxima [A] time = 0.7676, size = 140, normalized size = 1.33

$$\frac{5}{12}(2x^2 - x + 3)^{\frac{5}{2}}x + \frac{107}{240}(2x^2 - x + 3)^{\frac{5}{2}} + \frac{179}{384}(2x^2 - x + 3)^{\frac{3}{2}}x - \frac{179}{1536}(2x^2 - x + 3)^{\frac{3}{2}} + \frac{4117}{2048}\sqrt{2x^2 - x + 3}x + \frac{94691}{32768}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) - \frac{4117}{8192}\sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")`

[Out] $5/12*(2*x^2 - x + 3)^{(5/2)}*x + 107/240*(2*x^2 - x + 3)^{(5/2)} + 17/9/384*(2*x^2 - x + 3)^{(3/2)}*x - 179/1536*(2*x^2 - x + 3)^{(3/2)} + 4117/2048*\sqrt{2*x^2 - x + 3}*x + 94691/32768*\sqrt{2}*\operatorname{arcsinh}(1/2*3*\sqrt{23}*(4*x - 1)) - 4117/8192*\sqrt{2*x^2 - x + 3}$

Fricas [A] time = 0.279311, size = 116, normalized size = 1.1

$\frac{1}{983040} \sqrt{2} \left(4 \sqrt{2} (204800 x^5 + 14336 x^4 + 561024 x^3 + 319072 x^2 + 565276 x + 388341) \sqrt{2x^2 - x + 3} + 1420365 \log \left(-\sqrt{2} (3 \dots \right) \right)$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")`

[Out] $1/983040*\sqrt{2}*(4*\sqrt{2}*(204800*x^5 + 14336*x^4 + 561024*x^3 + 319072*x^2 + 565276*x + 388341)*\sqrt{2*x^2 - x + 3} + 1420365*\log(-\sqrt{2}*(32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)))$

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

$$\int (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2),x)`

[Out] `Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2), x)`

GIAC/XCAS [A] time = 0.268669, size = 99, normalized size = 0.94

$$\frac{1}{122880} (4(8(4(16(100x + 7)x + 4383)x + 9971)x + 141319)x + 388341)\sqrt{2x^2 - x + 3} - \frac{94691}{32768} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] 1/122880*(4*(8*(4*(16*(100*x + 7)*x + 4383)*x + 9971)*x + 141319)
*x + 388341)*sqrt(2*x^2 - x + 3) - 94691/32768*sqrt(2)*ln(-2*sqrt
(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

$$3.69 \quad \int \frac{(3-x+2x^2)^{3/2}}{2+3x+5x^2} dx$$

Optimal. Leaf size=197

$$\begin{aligned} & -\frac{1}{100}\sqrt{2x^2-x+3}(49-20x) \\ & + \frac{11}{125}\sqrt{\frac{11}{31}(247+500\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(247+500\sqrt{2})}}\left((130+69\sqrt{2})x+61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right) \\ & - \frac{11}{125}\sqrt{\frac{11}{31}(500\sqrt{2}-247)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(500\sqrt{2}-247)}}\left((130-69\sqrt{2})x-61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right) \\ & - \frac{2203 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1000\sqrt{2}} \end{aligned}$$

[Out] $-\frac{(49-20x)\sqrt{3-x+2x^2}}{100} - \frac{2203 \operatorname{ArcSinh}\left[\frac{1-4x}{\sqrt{23}}\right]}{1000\sqrt{2}} + \frac{11\sqrt{11(247+500\sqrt{2})}}{125\sqrt{31}} \operatorname{ArcTan}\left[\frac{\sqrt{\frac{11}{62(247+500\sqrt{2})}}\left((130+69\sqrt{2})x+61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right] - \frac{11\sqrt{11(500\sqrt{2}-247)}}{125\sqrt{31}} \operatorname{ArcTanh}\left[\frac{\sqrt{\frac{11}{62(500\sqrt{2}-247)}}\left((130-69\sqrt{2})x-61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right]$

Rubi [A] time = 1.00766, antiderivative size = 197, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$

$$\begin{aligned} & -\frac{1}{100}\sqrt{2x^2-x+3}(49-20x) \\ & + \frac{11}{125}\sqrt{\frac{11}{31}(247+500\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(247+500\sqrt{2})}}\left((130+69\sqrt{2})x+61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right) \\ & - \frac{11}{125}\sqrt{\frac{11}{31}(500\sqrt{2}-247)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(500\sqrt{2}-247)}}\left((130-69\sqrt{2})x-61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right) \\ & - \frac{2203 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1000\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2), x]

[Out] -((49 - 20*x)*Sqrt[3 - x + 2*x^2])/100 - (2203*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1000*Sqrt[2]) + (11*Sqrt[(11*(247 + 500*Sqrt[2]))]/31)*ArcTan[(Sqrt[11/(62*(247 + 500*Sqrt[2]))])*(8 + 61*Sqrt[2] + (130 + 69*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]]/125 - (11*Sqrt[(11*(-247 + 500*Sqrt[2]))]/31)*ArcTanh[(Sqrt[11/(62*(-247 + 500*Sqrt[2]))])*(8 - 61*Sqrt[2] + (130 - 69*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]]/125

Rubi in Sympy [A] time = 101.444, size = 226, normalized size = 1.15

$$\begin{aligned} & \frac{(-10x + \frac{49}{2}) \sqrt{2x^2 - x + 3}}{50} \\ & + \frac{\sqrt{341} (21296 + 162382\sqrt{2}) (15972\sqrt{2} + 85184) \operatorname{atan}\left(\frac{\sqrt{682}(x(183678\sqrt{2}+346060)+21296+162382\sqrt{2})}{165044\sqrt{247+500\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9985162000\sqrt{247+500\sqrt{2}}} \\ & + \frac{2203\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{2000} \\ & + \frac{\sqrt{341} (-162382\sqrt{2} + 21296) (-15972\sqrt{2} + 85184) \operatorname{atanh}\left(\frac{\sqrt{682}(x(-183678\sqrt{2}+346060)-162382\sqrt{2}+21296)}{165044\sqrt{-247+500\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9985162000\sqrt{-247+500\sqrt{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2), x)

[Out] -(-10*x + 49/2)*sqrt(2*x**2 - x + 3)/50 + sqrt(341)*(21296 + 162382*sqrt(2))*(15972*sqrt(2) + 85184)*atan(sqrt(682)*(x*(183678*sqrt(2) + 346060) + 21296 + 162382*sqrt(2))/(165044*sqrt(247 + 500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(9985162000*sqrt(247 + 500*sqrt(2))) + 2203*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/2000 + sqrt(341)*(-162382*sqrt(2) + 21296)*(-15972*sqrt(2) + 85184)*atanh(sqrt(682)*(x*(-183678*sqrt(2) + 346060) - 162382*sqrt(2) + 21296)/(165044*sqrt(-247 + 500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(9985162000*sqrt(-247 + 500*sqrt(2)))


```

268*I + 5966136*Sqrt[31] + (117642204*I)*x + 12374208*Sqrt[31]*x
+ (229312267*I)*x^2 + 7834134*Sqrt[31]*x^2 - (63298460*I)*x^3 + 6
693830*Sqrt[31]*x^3 + (136148325*I)*x^4 + 5762900*Sqrt[31]*x^4)]
/((125*Sqrt[(62*(-13 + I*Sqrt[31]))/11]) - (((11*I)/125)*(-69*I +
13*Sqrt[31])*ArcTan[(31*(560572*I + 192456*Sqrt[31] - (1391684*I)
*x + 399168*Sqrt[31]*x - (2195557*I)*x^2 + 252714*Sqrt[31]*x^2 -
(2861340*I)*x^3 + 215930*Sqrt[31]*x^3 - (2416075*I)*x^4 + 185900*
Sqrt[31]*x^4)]/(-10827432 + (603036*I)*Sqrt[31] + 28693104*x + (2
334908*I)*Sqrt[31]*x + 30301942*x^2 - (15923341*I)*Sqrt[31]*x^2 +
1428790*x^3 - (9329420*I)*Sqrt[31]*x^3 + 30587700*x^4 - (1263147
5*I)*Sqrt[31]*x^4 - (50000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3
- x + 2*x^2] + (125000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 -
x + 2*x^2] + (175000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 -
x + 2*x^2] + (500000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 -
x + 2*x^2]))/Sqrt[(62*(13 + I*Sqrt[31]))/11] - (11*(-69*I + 13*S
qrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10
*I)*x)^2])/((250*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + (((11*I)/250)*
(69*I + 13*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sq
rt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] - (((11*I
)/250)*(69*I + 13*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sq
rt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^
2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sq
rt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]))/Sqrt[(62*(-13
+ I*Sqrt[31]))/11] + (11*(-69*I + 13*Sqrt[31])*Log[(2 + 3*x + 5*
x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I
)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[
3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x +
2*x^2]))/(250*Sqrt[(62*(13 + I*Sqrt[31]))/11])

```

Maple [B] time = 0.058, size = 3460, normalized size = 17.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(3/2)/(5*x^2+3*x+2), x)

```

[Out] 2203/2000*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-49/100*(2*x^2-x+
3)^(1/2)+1/5*x*(2*x^2-x+3)^(1/2)-2/1321375*(8*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2
))^2*(4245*2^(1/2)*arctan(1/11692487*(-775687+549362*
2^(1/2))^2*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1
-x)^2+24*2^(1/2)-41))^2*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+3201
6)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+68
20*2^(1/2))^2*(-775687+549362*2^(1/2))^2*(2^(1/2)+1-x)^2+6154*arctan(1/11
692487*(-775687+549362*2^(1/2))^2*(-23*(8+3*2^(1/2))*(-23*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^2*(6485*2^(1/2)*

```


$$\begin{aligned}
& 1/2) * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)}) / (1 + (2^{(1/2)} - 1 + x) \\
&) / (2^{(1/2)} + 1 - x)^2)^{(1/2)} / (1 + (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x)) / (8 + 3 * 2^{(1/2)} \\
& (1/2)) / (-8866 + 6820 * 2^{(1/2)})^{(1/2)} + 3 / 10571 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} \\
& (1/2) + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)} \\
&)^{(1/2)} * 2^{(1/2)} * (151 * 2^{(1/2)} * \arctan(1 / 11692487 * (-775687 + 549362 * 2^{(1/2)} \\
& (1/2))^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)}) * (-23 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x) \\
&)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + \\
& 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) \\
& / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + \\
& 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x) * (-8866 + 6820 \\
& * 2^{(1/2)})^{(1/2)} * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} + 218 * \arctan(1 / 11692 \\
& 487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)}) * (-23 * (2^{(1/2)} - 1 + x) \\
&)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x) \\
&)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)} * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} + 401698 * \operatorname{arctanh}(31/2 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}) * 2^{(1/2)} - 63426 * \operatorname{arctanh}(31/2 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}) / ((8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)}) / (1 + (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x))^{(1/2)} / (1 + (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x)) / (8 + 3 * 2^{(1/2)}) / (-8866 + 6820 * 2^{(1/2)})^{(1/2)} + 9 / 21142 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} * 2^{(1/2)} * (369 * 2^{(1/2)} * \arctan(1 / 11692487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)}) * (-23 * (2^{(1/2)} - 1 + x) \\
&)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x) \\
&)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 2237 \\
& 9 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x) \\
&)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 \\
& - x) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)} * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} + 52 \\
& 0 * \arctan(1 / 11692487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)} \\
& (1/2)) * (-23 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (\\
& 6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x) \\
&)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} \\
& (1/2) + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2 \\
& ^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)} * (-775687 + 54 \\
& 9362 * 2^{(1/2)})^{(1/2)} + 465124 * \operatorname{arctanh}(31/2 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} \\
& (1/2) + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}) * 2^{(1/2)} - 866822 * \operatorname{arctanh}(31/2 * (8 * \\
& (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} \\
&) + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}) / ((8 * (2^{(1/2)} \\
& (1/2) - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - \\
& x)^2 + 8 - 3 * 2^{(1/2)}) / (1 + (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x))^{(1/2)} / (1 + (2^{(1/2)} \\
& (1/2) - 1 + x) / (2^{(1/2)} + 1 - x)) / (8 + 3 * 2^{(1/2)}) / (-8866 + 6820 * 2^{(1/2)})^{(1/2)} \\
&)
\end{aligned}$$

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

$$\int \frac{(2x^2 - x + 3)^{\frac{3}{2}}}{5x^2 + 3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2),x, algorithm="maxima")

[Out] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2), x)

Fricas [A] time = 0.346855, size = 1486, normalized size = 7.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2),x, algorithm="fricas")

[Out] -1/96100000*sqrt(155)*sqrt(31)*sqrt(10)*(2203*sqrt(155)*sqrt(31)*sqrt(10)*(500*sqrt(2) - 247)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009))*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)) - 20*sqrt(155)*sqrt(31)*sqrt(10)*sqrt(2*x^2 - x + 3)*(247*sqrt(2)*(20*x - 49) - 20000*x + 49000)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 220*968^(1/4)*sqrt(31)*(247*sqrt(2) - 1000)*log(-968/5*(968^(1/4)*sqrt(155)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13924547751*x + 10961882026) - 24886429777*x - 2962665725)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 167341615000*x^2 + 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) - 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) - 515685385000*x + 68302700000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) + 220*968^(1/4)*sqrt(31)*(247*sqrt(2) - 1000)*log(968/5*(968^(1/4)*sqrt(155)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13924547751*x + 10961882026) - 24886429777*x - 2962665725)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 167341615000*x^2 - 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) + 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) + 515685385000*x - 68302700000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) - 3246320*968^(1/4)*sqrt(2)*arctan(31*(sqrt(155)*sqrt(10)*(500*sqrt(2)*(x - 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 10*968^(1/4)*sqrt(2*x^2 - x + 3)*(4*sqrt(2) - 61))/(2*sqrt(155)*sqrt(31)*sqrt(10)*sqrt(2/5)*(500*sqrt(2)*x - 247*x)*sqrt(-(968^(1/4)*sqrt(155)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13924547751*x + 10961882026) - 24886429777*x - 2962665725)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 167341615000*x^2 + 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 6830

```

27000*x + 2049081000) - 1927846115*sqrt(2)*(49*x^2 - 151*x + 200)
- 515685385000*x + 683027000000)/(385569223*sqrt(2)*x^2 - 683027
000*x^2))*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) +
sqrt(155)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693*x + 5
434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 310*9
68^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(8*sqrt(2) - 3))) - 3246320
*968^(1/4)*sqrt(2)*arctan(-31*(sqrt(155)*sqrt(10)*(500*sqrt(2)*(x
- 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) -
561009)) - 10*968^(1/4)*sqrt(2*x^2 - x + 3)*(4*sqrt(2) - 61))/(2
*sqrt(155)*sqrt(31)*sqrt(10)*sqrt(2/5)*(500*sqrt(2)*x - 247*x)*sq
rt((968^(1/4)*sqrt(155)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13
924547751*x + 10961882026) - 24886429777*x - 2962665725)*sqrt((24
7*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 167341615000*x^2 -
220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3)
- 683027000*x + 2049081000) + 1927846115*sqrt(2)*(49*x^2 - 151*x
+ 200) + 515685385000*x - 683027000000)/(385569223*sqrt(2)*x^2 -
683027000*x^2))*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 56100
9)) + sqrt(155)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693
*x + 5434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) +
310*968^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(8*sqrt(2) - 3)))/((
247*sqrt(2) - 1000)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 5
61009)))

```

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

$$\int \frac{(2x^2 - x + 3)^{\frac{3}{2}}}{5x^2 + 3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2),x)

[Out] Integral((2*x**2 - x + 3)**(3/2)/(5*x**2 + 3*x + 2), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2),x, algorithm="giac")

[Out] Exception raised: TypeError

$$3.70 \quad \int \frac{(3-x+2x^2)^{3/2}}{(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=232

$$\begin{aligned} & \frac{(10x+3)(2x^2-x+3)^{3/2}}{31(5x^2+3x+2)} + \frac{4}{155}(4-5x)\sqrt{2x^2-x+3} \\ & + \frac{\sqrt{\frac{11}{31}(3169333+2265350\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(3169333+2265350\sqrt{2})}}((9440+6477\sqrt{2})x+2963\sqrt{2}+3514)}}{\sqrt{2x^2-x+3}}\right)}{1550} \\ & - \frac{\sqrt{\frac{11}{31}(2265350\sqrt{2}-3169333)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(2265350\sqrt{2}-3169333)}}((9440-6477\sqrt{2})x-2963\sqrt{2}+3514)}}{\sqrt{2x^2-x+3}}\right)}{1550} \\ & - \frac{2}{25}\sqrt{2} \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right) \end{aligned}$$

[Out] (4*(4 - 5*x)*Sqrt[3 - x + 2*x^2])/155 + ((3 + 10*x)*(3 - x + 2*x^2)^(3/2))/(31*(2 + 3*x + 5*x^2)) - (2*Sqrt[2]*ArcSinh[(1 - 4*x)/Sqrt[23]])/25 + (Sqrt[(11*(3169333 + 2265350*Sqrt[2]))]/31)*ArcTan[(Sqrt[11/(62*(3169333 + 2265350*Sqrt[2]))])*(3514 + 2963*Sqrt[2] + (9440 + 6477*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/1550 - (Sqrt[(11*(-3169333 + 2265350*Sqrt[2]))]/31)*ArcTanh[(Sqrt[11/(62*(-3169333 + 2265350*Sqrt[2]))])*(3514 - 2963*Sqrt[2] + (9440 - 6477*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/1550

Rubi [A] time = 1.16423, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\begin{aligned} & \frac{(10x+3)(2x^2-x+3)^{3/2}}{31(5x^2+3x+2)} + \frac{4}{155}(4-5x)\sqrt{2x^2-x+3} \\ & + \frac{\sqrt{\frac{11}{31}(3169333+2265350\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(3169333+2265350\sqrt{2})}}((9440+6477\sqrt{2})x+2963\sqrt{2}+3514)}}{\sqrt{2x^2-x+3}}\right)}{1550} \\ & - \frac{\sqrt{\frac{11}{31}(2265350\sqrt{2}-3169333)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(2265350\sqrt{2}-3169333)}}((9440-6477\sqrt{2})x-2963\sqrt{2}+3514)}}{\sqrt{2x^2-x+3}}\right)}{1550} \\ & - \frac{2}{25}\sqrt{2} \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right) \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^2, x]

[Out] (4*(4 - 5*x)*Sqrt[3 - x + 2*x^2])/155 + ((3 + 10*x)*(3 - x + 2*x^2)^(3/2))/(31*(2 + 3*x + 5*x^2)) - (2*Sqrt[2]*ArcSinh[(1 - 4*x)/Sqrt[23]])/25 + (Sqrt[(11*(3169333 + 2265350*Sqrt[2]))]/31]*ArcTan[(Sqrt[11/(62*(3169333 + 2265350*Sqrt[2]))])*(3514 + 2963*Sqrt[2] + (9440 + 6477*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/1550 - (Sqrt[(11*(-3169333 + 2265350*Sqrt[2]))]/31]*ArcTanh[(Sqrt[11/(62*(-3169333 + 2265350*Sqrt[2]))])*(3514 - 2963*Sqrt[2] + (9440 - 6477*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/1550

Rubi in Sympy [A] time = 127.233, size = 255, normalized size = 1.1

$$\frac{(-400x + 320)\sqrt{2x^2 - x + 3}}{3100} + \frac{(10x + 3)(2x^2 - x + 3)^{\frac{3}{2}}}{31(5x^2 + 3x + 2)}$$

$$+ \frac{\sqrt{341} \left(4251940 + 3585230\sqrt{2} \right) \left(1328580\sqrt{2} + 2124760 \right) \operatorname{atan} \left(-\frac{\sqrt{682} \left(x(-11422400 - 7837170\sqrt{2}) - 3585230\sqrt{2} - 4251940 \right)}{75020\sqrt{3169333 + 2265350\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{281400020000\sqrt{3169333 + 2265350\sqrt{2}}}$$

$$+ \frac{2\sqrt{2} \operatorname{atanh} \left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}} \right)}{25}$$

$$- \frac{\sqrt{341} \left(-3585230\sqrt{2} + 4251940 \right) \left(-1328580\sqrt{2} + 2124760 \right) \operatorname{atanh} \left(\frac{\sqrt{682} \left(x(-11422400 + 7837170\sqrt{2}) - 4251940 + 3585230\sqrt{2} \right)}{75020\sqrt{-3169333 + 2265350\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{281400020000\sqrt{-3169333 + 2265350\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2, x)

[Out] (-400*x + 320)*sqrt(2*x**2 - x + 3)/3100 + (10*x + 3)*(2*x**2 - x + 3)**(3/2)/(31*(5*x**2 + 3*x + 2)) + sqrt(341)*(4251940 + 3585230*sqrt(2))*(1328580*sqrt(2) + 2124760)*atan(-sqrt(682)*(x*(-11422400 - 7837170*sqrt(2)) - 3585230*sqrt(2) - 4251940)/(75020*sqrt(3169333 + 2265350*sqrt(2))*sqrt(2*x**2 - x + 3)))/(281400020000*sqrt(3169333 + 2265350*sqrt(2))) + 2*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/25 - sqrt(341)*(-3585230*sqrt(2) + 4251940)*(-1328580*sqrt(2) + 2124760)*atanh(sqrt(682)*(x*(-11422400 + 7837170*sqrt(2)) - 4251940 + 3585230*sqrt(2))/(75020*sqrt(-3169333 + 2265350*sqrt(2))*sqrt(2*x**2 - x + 3)))/(281400020000*sqrt(-3169333 + 2265350*sqrt(2)))

Mathematica [C] time = 6.46918, size = 1180, normalized size = 5.09

$$\frac{11\sqrt{2x^2 - x + 3}(13x + 7)}{155(5x^2 + 3x + 2)} + \frac{2}{25}\sqrt{2}\sinh^{-1}\left(\frac{4x - 1}{\sqrt{23}}\right)$$

$$i(-6477i + 329\sqrt{31})\tan^{-1}\left(\frac{31(119065100\sqrt{31}x^4 + 6307093100\sqrt{31}x^3 - 51859993775i\sqrt{31}x^4 + 72664815300x^4 + 2265350000i\sqrt{682(13 + i\sqrt{31})}\sqrt{2x^2 - x + 3x^3} - 24348414380i\sqrt{31}x^3 + 138879039310x^3}{-51859993775i\sqrt{31}x^4 + 72664815300x^4 + 2265350000i\sqrt{682(13 + i\sqrt{31})}\sqrt{2x^2 - x + 3x^3} - 24348414380i\sqrt{31}x^3 + 138879039310x^3}\right)$$

$$i(6477i + 329\sqrt{31})\tanh^{-1}\left(\frac{51859993775\sqrt{31}x^4 - 72664815300ix^4 + 12459425000\sqrt{22(-13 + i\sqrt{31})}\sqrt{2x^2 - x + 3x^3} + 24348414380\sqrt{31}x^3 - 138879039310ix^3}{3691018100\sqrt{31}x^4 + 257953385925ix^3}\right)$$

$$+ \frac{i(6477i + 329\sqrt{31})\log\left(\left(-10ix + \sqrt{31} - 3i\right)^2\left(10ix + \sqrt{31} + 3i\right)^2\right)}{3100\sqrt{\frac{62}{11}}(-13 + i\sqrt{31})}$$

$$- \frac{(-6477i + 329\sqrt{31})\log\left(\left(-10ix + \sqrt{31} - 3i\right)^2\left(10ix + \sqrt{31} + 3i\right)^2\right)}{3100\sqrt{\frac{62}{11}}(13 + i\sqrt{31})}$$

$$+ \frac{i(6477i + 329\sqrt{31})\log\left((5x^2 + 3x + 2)\left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682(-13 + i\sqrt{31})}\sqrt{2x^2 - x + 3x} - 22\sqrt{31}x + 469ix + 630709325\right)\right)}{3100\sqrt{\frac{62}{11}}(-13 + i\sqrt{31})}$$

$$+ \frac{(-6477i + 329\sqrt{31})\log\left((5x^2 + 3x + 2)\left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13 + i\sqrt{31})}\sqrt{2x^2 - x + 3x} - 22\sqrt{31}x + 1041ix - 630709325\right)\right)}{3100\sqrt{\frac{62}{11}}(13 + i\sqrt{31})}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^2, x]

[Out] (11*(7 + 13*x)*Sqrt[3 - x + 2*x^2])/(155*(2 + 3*x + 5*x^2)) + (2*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/25 - ((I/1550)*(-6477*I + 329*Sqrt[31])*ArcTan[(31*(1332489508*I + 919236384*Sqrt[31] - (5674354076*I)*x + 503954352*Sqrt[31]*x + (3996168827*I)*x^2 + 521299746*Sqrt[31]*x^2 - (5894056260*I)*x^3 + 480711770*Sqrt[31]*x^3 + (630709325*I)*x^4 + 119065100*Sqrt[31]*x^4))/(35246261952 + (8643872004*I)*Sqrt[31] + 251068416456*x - (16524047788*I)*Sqrt[31]*x + 44889007438*x^2 - (59243175649*I)*Sqrt[31]*x^2 + 138879039310*x^3 - (24348414380*I)*Sqrt[31]*x^3 + 72664815300*x^4 - (51859993775*I)*Sqrt[31]*x^4 - (226535000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqr

```

t[3 - x + 2*x^2] + (566337500*I)*Sqrt[682*(13 + I*Sqrt[31])] * x * Sqrt[3 - x + 2*x^2] + (792872500*I)*Sqrt[682*(13 + I*Sqrt[31])] * x^2 * Sqrt[3 - x + 2*x^2] + (2265350000*I)*Sqrt[682*(13 + I*Sqrt[31])] * x^3 * Sqrt[3 - x + 2*x^2] / Sqrt[(62*(13 + I*Sqrt[31]))/11] - ((I/1550)*(6477*I + 329*Sqrt[31])*ArcTanh[(-35246261952*I - 8643872004*Sqrt[31] - (251068416456*I)*x + 16524047788*Sqrt[31]*x - (44889007438*I)*x^2 + 59243175649*Sqrt[31]*x^2 - (138879039310*I)*x^3 + 24348414380*Sqrt[31]*x^3 - (72664815300*I)*x^4 + 51859993775*Sqrt[31]*x^4 - 14271705000*Sqrt[22*(-13 + I*Sqrt[31])] * Sqrt[3 - x + 2*x^2] - 16423787500*Sqrt[22*(-13 + I*Sqrt[31])] * x * Sqrt[3 - x + 2*x^2] - 28203607500*Sqrt[22*(-13 + I*Sqrt[31])] * x^2 * Sqrt[3 - x + 2*x^2] + 12459425000*Sqrt[22*(-13 + I*Sqrt[31])] * x^3 * Sqrt[3 - x + 2*x^2]) / (411762825252*I + 28496327904*Sqrt[31] + (513442126356*I)*x + 15622584912*Sqrt[31]*x + (606694141363*I)*x^2 + 16160292126*Sqrt[31]*x^2 - (505950655940*I)*x^3 + 14902064870*Sqrt[31]*x^3 + (257953385925*I)*x^4 + 3691018100*Sqrt[31]*x^4)] / Sqrt[(62*(-13 + I*Sqrt[31]))/11] - ((-6477*I + 329*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2]) / (3100*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + ((I/3100)*(6477*I + 329*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2]) / Sqrt[(62*(-13 + I*Sqrt[31]))/11] - ((I/3100)*(6477*I + 329*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])] * Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])] * x * Sqrt[3 - x + 2*x^2])]) / Sqrt[(62*(-13 + I*Sqrt[31]))/11] + ((-6477*I + 329*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])] * Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])] * x * Sqrt[3 - x + 2*x^2])]) / (3100*Sqrt[(62*(13 + I*Sqrt[31]))/11])

```

Maple [B] time = 0.182, size = 28185, normalized size = 121.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2x^2 - x + 3)^{3/2} / (5x^2 + 3x + 2)^2, x)$

[Out] result too large to display

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

$$\int \frac{(2x^2 - x + 3)^{3/2}}{(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2, x)
```

Fricas [A] time = 0.372002, size = 1548, normalized size = 6.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")
```

```
[Out] -1/8708005400*sqrt(45307)*(7688*sqrt(45307)*(22653500*x^2 - 31693
33*sqrt(2)*(5*x^2 + 3*x + 2) + 13592100*x + 9061400)*sqrt((316933
3*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 20308292909889))*1
og(-4*sqrt(2)*sqrt(2*x^2 - x + 3)*(4*x - 1) - 32*x^2 + 16*x - 25)
- 496759268258^(1/4)*sqrt(31)*(15846665*x^2 - 2265350*sqrt(2)*(5
*x^2 + 3*x + 2) + 9507999*x + 6338666)*log(-362456*(2*49675926825
8^(1/4)*sqrt(45307)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(383885
744793046756031052*x + 159010700580463280083427) - 54289644537351
0036114479*x - 224875044212583475947625)*sqrt((3169333*sqrt(2) -
4530700)/(14359297023100*sqrt(2) - 20308292909889)) + 40633351680
6083570266906700*x^2 + 1993508*sqrt(2)*(366059141022118553800*x^2
- 129421409915536404037*sqrt(2)*(2*x^2 - x + 3) - 18302957051105
9276900*x + 549088711533177830700) - 5863695819043207857704359*sq
rt(2)*(49*x^2 - 151*x + 200) - 1252170633422828961434753300*x + 1
658504150228912531701660000)/(129421409915536404037*sqrt(2)*x^2 -
183029570511059276900*x^2)) + 496759268258^(1/4)*sqrt(31)*(15846
665*x^2 - 2265350*sqrt(2)*(5*x^2 + 3*x + 2) + 9507999*x + 6338666
)*log(362456*(2*496759268258^(1/4)*sqrt(45307)*sqrt(31)*sqrt(2*x^
2 - x + 3)*(sqrt(2)*(383885744793046756031052*x + 159010700580463
280083427) - 542896445373510036114479*x - 22487504421258347594762
5)*sqrt((3169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 203
08292909889)) - 406333516806083570266906700*x^2 - 1993508*sqrt(2)
*(366059141022118553800*x^2 - 129421409915536404037*sqrt(2)*(2*x^
2 - x + 3) - 183029570511059276900*x + 549088711533177830700) + 5
863695819043207857704359*sqrt(2)*(49*x^2 - 151*x + 200) + 1252170
633422828961434753300*x - 1658504150228912531701660000)/(12942140
9915536404037*sqrt(2)*x^2 - 183029570511059276900*x^2)) + 13640*s
qrt(45307)*sqrt(2*x^2 - x + 3)*(2265350*sqrt(2)*(13*x + 7) - 4120
1329*x - 22185331)*sqrt((3169333*sqrt(2) - 4530700)/(143592970231
00*sqrt(2) - 20308292909889)) - 10421084*496759268258^(1/4)*(5*x^
2 + 3*x + 2)*arctan(45307*(sqrt(45307)*sqrt(31)*(2265350*sqrt(2)*
(x - 6) - 3169333*x + 19015998)*sqrt((3169333*sqrt(2) - 4530700)/
(14359297023100*sqrt(2) - 20308292909889)) + 2*496759268258^(1/4)
*sqrt(2*x^2 - x + 3)*(1757*sqrt(2) - 2963))/(2*sqrt(90614)*sqrt(4
5307)*(2265350*sqrt(2)*x - 3169333*x)*sqrt(-(2*496759268258^(1/4)
```



```

*sqrt(45307)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(3838857447930
46756031052*x + 159010700580463280083427) - 542896445373510036114
479*x - 224875044212583475947625)*sqrt((3169333*sqrt(2) - 4530700
)/(14359297023100*sqrt(2) - 20308292909889)) + 406333516806083570
266906700*x^2 + 1993508*sqrt(2)*(366059141022118553800*x^2 - 1294
21409915536404037*sqrt(2)*(2*x^2 - x + 3) - 183029570511059276900
*x + 549088711533177830700) - 5863695819043207857704359*sqrt(2)*(
49*x^2 - 151*x + 200) - 1252170633422828961434753300*x + 16585041
50228912531701660000)/(129421409915536404037*sqrt(2)*x^2 - 183029
570511059276900*x^2)*sqrt((3169333*sqrt(2) - 4530700)/(143592970
23100*sqrt(2) - 20308292909889)) - 90614*496759268258^(1/4)*sqrt(
31)*sqrt(2*x^2 - x + 3)*(439*sqrt(2) - 549) + 45307*sqrt(45307)*(
2265350*sqrt(2)*(19*x - 22) - 60217327*x + 69725326)*sqrt((316933
3*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 20308292909889)))
- 10421084*496759268258^(1/4)*(5*x^2 + 3*x + 2)*arctan(-45307*(s
qrt(45307)*sqrt(31)*(2265350*sqrt(2)*(x - 6) - 3169333*x + 190159
98)*sqrt((3169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 20
308292909889)) - 2*496759268258^(1/4)*sqrt(2*x^2 - x + 3)*(1757*s
qrt(2) - 2963))/(2*sqrt(90614)*sqrt(45307)*(2265350*sqrt(2)*x - 3
169333*x)*sqrt((2*496759268258^(1/4)*sqrt(45307)*sqrt(31)*sqrt(2*
x^2 - x + 3)*(sqrt(2)*(383885744793046756031052*x + 1590107005804
63280083427) - 542896445373510036114479*x - 224875044212583475947
625)*sqrt((3169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 2
0308292909889)) - 406333516806083570266906700*x^2 - 1993508*sqrt(
2)*(366059141022118553800*x^2 - 129421409915536404037*sqrt(2)*(2*
x^2 - x + 3) - 183029570511059276900*x + 549088711533177830700) +
5863695819043207857704359*sqrt(2)*(49*x^2 - 151*x + 200) + 12521
70633422828961434753300*x - 1658504150228912531701660000)/(129421
409915536404037*sqrt(2)*x^2 - 183029570511059276900*x^2)*sqrt((3
169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 2030829290988
9)) + 90614*496759268258^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(439*
sqrt(2) - 549) + 45307*sqrt(45307)*(2265350*sqrt(2)*(19*x - 22) -
60217327*x + 69725326)*sqrt((3169333*sqrt(2) - 4530700)/(1435929
7023100*sqrt(2) - 20308292909889))))/((15846665*x^2 - 2265350*sq
rt(2)*(5*x^2 + 3*x + 2) + 9507999*x + 6338666)*sqrt((3169333*sqrt
(2) - 4530700)/(14359297023100*sqrt(2) - 20308292909889)))

```

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

$$\int \frac{(2x^2 - x + 3)^{\frac{3}{2}}}{(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)

[Out] Integral((2*x**2 - x + 3)**(3/2)/(5*x**2 + 3*x + 2)**2, x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")`

[Out] Exception raised: TypeError

$$3.71 \quad \int \frac{(3-x+2x^2)^{3/2}}{(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=223

$$\frac{(10x+3)(2x^2-x+3)^{3/2}}{62(5x^2+3x+2)^2} + \frac{3(696x+277)\sqrt{2x^2-x+3}}{3844(5x^2+3x+2)}$$

$$+ \frac{3\sqrt{\frac{1}{682}(366990269+259509026\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(366990269+259509026\sqrt{2})}}((70517+49942\sqrt{2})x+20575\sqrt{2}+29367)}}{\sqrt{2x^2-x+3}}\right)}{7688}$$

$$- \frac{3\sqrt{\frac{1}{682}(259509026\sqrt{2}-366990269)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(259509026\sqrt{2}-366990269)}}((70517-49942\sqrt{2})x-20575\sqrt{2}+29367)}}{\sqrt{2x^2-x+3}}\right)}{7688}$$

[Out] $((3 + 10*x) * (3 - x + 2*x^2)^{(3/2)}) / (62 * (2 + 3*x + 5*x^2)^2) + (3 * (277 + 696*x) * \text{Sqrt}[3 - x + 2*x^2]) / (3844 * (2 + 3*x + 5*x^2)) + (3 * \text{Sqrt}[(366990269 + 259509026 * \text{Sqrt}[2]) / 682] * \text{ArcTan}[(\text{Sqrt}[11 / (31 * (366990269 + 259509026 * \text{Sqrt}[2]))]) * (29367 + 20575 * \text{Sqrt}[2] + (70517 + 49942 * \text{Sqrt}[2]) * x)] / \text{Sqrt}[3 - x + 2*x^2]]) / 7688 - (3 * \text{Sqrt}[(-366990269 + 259509026 * \text{Sqrt}[2]) / 682] * \text{ArcTanh}[(\text{Sqrt}[11 / (31 * (-366990269 + 259509026 * \text{Sqrt}[2]))]) * (29367 - 20575 * \text{Sqrt}[2] + (70517 - 49942 * \text{Sqrt}[2]) * x)] / \text{Sqrt}[3 - x + 2*x^2]]) / 7688$

Rubi [A] time = 0.911228, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{(10x+3)(2x^2-x+3)^{3/2}}{62(5x^2+3x+2)^2} + \frac{3(696x+277)\sqrt{2x^2-x+3}}{3844(5x^2+3x+2)}$$

$$+ \frac{3\sqrt{\frac{1}{682}(366990269+259509026\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(366990269+259509026\sqrt{2})}}((70517+49942\sqrt{2})x+20575\sqrt{2}+29367)}}{\sqrt{2x^2-x+3}}\right)}{7688}$$

$$- \frac{3\sqrt{\frac{1}{682}(259509026\sqrt{2}-366990269)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(259509026\sqrt{2}-366990269)}}((70517-49942\sqrt{2})x-20575\sqrt{2}+29367)}}{\sqrt{2x^2-x+3}}\right)}{7688}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^3, x]

[Out] $((3 + 10x)(3 - x + 2x^2)^{3/2}) / (62(2 + 3x + 5x^2)^2) + (3(277 + 696x)\sqrt{3 - x + 2x^2}) / (3844(2 + 3x + 5x^2)) + (3\sqrt{(366990269 + 259509026\sqrt{2})/682}) \operatorname{ArcTan}(\sqrt{11/(31(366990269 + 259509026\sqrt{2}))}) * (29367 + 20575\sqrt{2} + (70517 + 49942\sqrt{2})x) / \sqrt{3 - x + 2x^2}) / 7688 - (3\sqrt{(-366990269 + 259509026\sqrt{2})/682}) \operatorname{ArcTanh}(\sqrt{11/(31(-366990269 + 259509026\sqrt{2}))}) * (29367 - 20575\sqrt{2} + (70517 - 49942\sqrt{2})x) / \sqrt{3 - x + 2x^2}) / 7688$

Rubi in Sympy [A] time = 92.9457, size = 284, normalized size = 1.27

$$\frac{(10x + 3)(2x^2 - x + 3)^{\frac{3}{2}}}{62(5x^2 + 3x + 2)^2} + \frac{(1044x + \frac{831}{2})\sqrt{2x^2 - x + 3}}{1922(5x^2 + 3x + 2)}$$

$$+ \frac{1404928 \cdot 2^{\frac{47}{114}} \cdot 3^{\frac{3}{19}} \sqrt{341} \cdot 5^{\frac{32}{57}} \cdot 7^{\frac{40}{57}} \left(\frac{206481}{2} + \frac{146949\sqrt{2}}{2}\right) \left(\frac{678975\sqrt{2}}{4} + \frac{969111}{4}\right) \operatorname{atan}\left(-\frac{5619712 \cdot 2^{\frac{52}{57}} \cdot 3^{\frac{3}{19}} \sqrt{341} \cdot 5^{\frac{32}{57}} \cdot 7^{\frac{40}{57}} \left(x \left(-\frac{824043\sqrt{2}}{2} - \frac{2327061}{4}\right)\right)}{842926025390625\sqrt{2x^2 - x + 3}}\right)}{98016281158447265625}$$

$$+ \frac{\sqrt{682} \left(-\frac{678975\sqrt{2}}{4} + \frac{969111}{4}\right) \left(-\frac{146949\sqrt{2}}{2} + \frac{206481}{2}\right) \operatorname{atanh}\left(\frac{4\sqrt{341} \left(x \left(-\frac{2327061}{4} + \frac{824043\sqrt{2}}{2}\right) - \frac{969111}{4} + \frac{678975\sqrt{2}}{4}\right)}{1023\sqrt{-366990269 + 259509026\sqrt{2}}\sqrt{2x^2 - x + 3}}\right)}{237910926\sqrt{-366990269 + 259509026\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)`

[Out] $(10x + 3)(2x^2 - x + 3)^{3/2} / (62(5x^2 + 3x + 2)^2) + (1044x + 831/2)\sqrt{2x^2 - x + 3} / (1922(5x^2 + 3x + 2)) + 1404928 \cdot 2^{47/114} \cdot 3^{3/19} \sqrt{341} \cdot 5^{32/57} \cdot 7^{40/57} \cdot (206481/2 + 146949\sqrt{2}/2) \cdot (678975\sqrt{2}/4 + 969111/4) \operatorname{atan}(-5619712 \cdot 2^{52/57} \cdot 3^{3/19} \sqrt{341} \cdot 5^{32/57} \cdot 7^{40/57} \cdot (x(-824043\sqrt{2}/2 - 2327061/4) - 969111/4 - 678975\sqrt{2}/4) / (842926025390625\sqrt{2x^2 - x + 3})) / 98016281158447265625 - \sqrt{682} \cdot (-678975\sqrt{2}/4 + 969111/4) \cdot (-146949\sqrt{2}/2 + 206481/2) \operatorname{atanh}(4\sqrt{341} \cdot (x(-2327061/4 + 824043\sqrt{2}/2) - 969111/4 + 678975\sqrt{2}/4) / (1023\sqrt{-366990269 + 259509026\sqrt{2}}\sqrt{2x^2 - x + 3})) / (237910926\sqrt{-366990269 + 259509026\sqrt{2}})$


```

725650*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (1621
9314125*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (2
2707039775*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2]
+ (64877256500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2
*x^2]))/Sqrt[682*(13 + I*Sqrt[31])] - (((3*I)/3844)*(24971*I + 9
02*Sqrt[31])*ArcTanh[(11*(1091580705511*I + 71239518597*Sqrt[31]
+ (1296309231133*I)*x + 22687750241*Sqrt[31]*x + (1456138041834*I
)*x^2 + 39581444118*Sqrt[31]*x^2 - (1365505300720*I)*x^3 + 284339
98560*Sqrt[31]*x^3 + (562393146150*I)*x^4 + 5044344800*Sqrt[31]*x
^4)]/(-1329350472021*I - 251835138467*Sqrt[31] - (7060303464863*I
)*x + 560818641999*Sqrt[31]*x - (689282588324*I)*x^2 + 1457613959
802*Sqrt[31]*x^2 - (4234217180380*I)*x^3 + 535663546990*Sqrt[31]*
x^3 - (1536126024400*I)*x^4 + 1305722486200*Sqrt[31]*x^4 - 408726
715950*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 47036010
9625*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 80772184
3425*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 356824
910750*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2]))/Sqr
t[682*(-13 + I*Sqrt[31])] - (3*(-24971*I + 902*Sqrt[31])*Log[(-3*
I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(7688*
Sqrt[682*(13 + I*Sqrt[31])]) + (((3*I)/7688)*(24971*I + 902*Sqrt[
31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*
x)^2])/Sqrt[682*(-13 + I*Sqrt[31])] - (((3*I)/7688)*(24971*I + 90
2*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)
*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(
-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*
Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]])/Sqrt[682*(-13 + I*Sqrt[31])]
+ (3*(-24971*I + 902*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 6
6*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[3
1]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] +
(22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]])/((7688*
Sqrt[682*(13 + I*Sqrt[31])])

```

Maple [B] time = 0.373, size = 81415, normalized size = 365.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}((2x^2 - x + 3)^{3/2} / (5x^2 + 3x + 2)^3, x)$

[Out] result too large to display

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

$$\int \frac{(2x^2 - x + 3)^{3/2}}{(5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3, x)
```

Fricas [A] time = 0.367025, size = 1601, normalized size = 7.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] 1/28767113409191937472*sqrt(129754513)*232562^(3/4)*sqrt(31)*(8*s
sqrt(129754513)*232562^(1/4)*sqrt(31)*(6062130847360*x^3 + 5278932
606892*x^2 - 366990269*sqrt(2)*(11680*x^3 + 10171*x^2 + 8343*x +
2220) + 4330167607836*x + 1152220075440)*sqrt(2*x^2 - x + 3)*sqrt
((366990269*sqrt(2) - 519018052)/(190474574519335988*sqrt(2) - 26
9371726691629713)) + 189113268*sqrt(129754513)*sqrt(2)*(25*x^4 +
30*x^3 + 29*x^2 + 12*x + 4)*arctan(31*(sqrt(129754513)*232562^(1/
4)*(366990269*sqrt(2)*(x - 6) - 519018052*x + 3114108312)*sqrt((3
66990269*sqrt(2) - 519018052)/(190474574519335988*sqrt(2) - 26937
1726691629713)) + 44*sqrt(129754513)*sqrt(2*x^2 - x + 3)*(20575*s
qrt(2) - 29367))/(2*sqrt(129754513)*232562^(1/4)*sqrt(31)*(366990
269*sqrt(2)*x - 519018052*x)*sqrt(-sqrt(2)*(46*232562^(1/4)*sqrt(
2*x^2 - x + 3)*(sqrt(2)*(386989138339976299220055293849*x + 16029
6149591496060582087946227) - 547285287931472359802143240076*x - 2
26692988748480238637967347622)*sqrt((366990269*sqrt(2) - 51901805
2)/(190474574519335988*sqrt(2) - 269371726691629713)) + 492119618
37700530566998189120*x^2 + sqrt(2)*(13701057557087079532857450380
*x^2 - 197716545062110269247518173*sqrt(2)*(49*x^2 - 151*x + 200)
- 42221626349390796111458673620*x + 5592268390647787564431612400
0) - 17399055965465703693781599224*sqrt(2)*(2*x^2 - x + 3) - 2460
5980918850265283499094560*x + 73817942756550795850497283680)/(197
716545062110269247518173*sqrt(2)*x^2 - 27961341953238937822158062
0*x^2))*sqrt((366990269*sqrt(2) - 519018052)/(190474574519335988*
sqrt(2) - 269371726691629713)) + sqrt(129754513)*232562^(1/4)*sq
rt(31)*(366990269*sqrt(2)*(19*x - 22) - 9861342988*x + 11418397144
)*sqrt((366990269*sqrt(2) - 519018052)/(190474574519335988*sqrt(2)
) - 269371726691629713)) - 1364*sqrt(129754513)*sqrt(31)*sqrt(2*x
^2 - x + 3)*(4453*sqrt(2) - 6257)) + 189113268*sqrt(129754513)*s
qrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-31*(sqrt(129
754513)*232562^(1/4)*(366990269*sqrt(2)*(x - 6) - 519018052*x + 3
114108312)*sqrt((366990269*sqrt(2) - 519018052)/(1904745745193359
88*sqrt(2) - 269371726691629713)) - 44*sqrt(129754513)*sqrt(2*x^2
- x + 3)*(20575*sqrt(2) - 29367))/(2*sqrt(129754513)*232562^(1/4
))*sqrt(31)*(366990269*sqrt(2)*x - 519018052*x)*sqrt(sqrt(2)*(46*2
32562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(38698913833997629922005
```

$$\begin{aligned}
& 5293849*x + 160296149591496060582087946227) - 5472852879314723598 \\
& 02143240076*x - 226692988748480238637967347622)*\sqrt{((366990269*s \\
& \text{qrt}(2) - 519018052)/(190474574519335988*\sqrt{2} - 269371726691629 \\
& 713)) - 49211961837700530566998189120*x^2 - \sqrt{2}*(137010575570 \\
& 87079532857450380*x^2 - 197716545062110269247518173*\sqrt{2}*(49*x \\
& ^2 - 151*x + 200) - 42221626349390796111458673620*x + 55922683906 \\
& 477875644316124000) + 17399055965465703693781599224*\sqrt{2}*(2*x^ \\
& 2 - x + 3) + 24605980918850265283499094560*x - 738179427565507958 \\
& 50497283680)/(197716545062110269247518173*\sqrt{2}*x^2 - 279613419 \\
& 532389378221580620*x^2))*\sqrt{((366990269*\sqrt{2} - 519018052)/(19 \\
& 0474574519335988*\sqrt{2} - 269371726691629713)) + \sqrt{129754513)} \\
& *232562^{(1/4)}*\sqrt{31}*(366990269*\sqrt{2}*(19*x - 22) - 986134298 \\
& 8*x + 11418397144)*\sqrt{((366990269*\sqrt{2} - 519018052)/(19047457 \\
& 4519335988*\sqrt{2} - 269371726691629713)) + 1364*\sqrt{129754513)}* \\
& \sqrt{31}*\sqrt{2*x^2 - x + 3}*(4453*\sqrt{2} - 6257))) + 3*\sqrt{129 \\
& 754513)*\sqrt{31}*(12975451300*x^4 + 15570541560*x^3 + 15051523508 \\
& *x^2 - 366990269*\sqrt{2}*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + \\
& 6228216624*x + 2076072208)*\log(-606104411179218084*\sqrt{2}*(46*23 \\
& 2562^{(1/4)}*\sqrt{2*x^2 - x + 3}*(\sqrt{2}*(386989138339976299220055 \\
& 293849*x + 160296149591496060582087946227) - 54728528793147235980 \\
& 2143240076*x - 226692988748480238637967347622)*\sqrt{((366990269*s \\
& \text{qrt}(2) - 519018052)/(190474574519335988*\sqrt{2} - 2693717266916297 \\
& 13)) + 49211961837700530566998189120*x^2 + \sqrt{2}*(1370105755708 \\
& 7079532857450380*x^2 - 197716545062110269247518173*\sqrt{2}*(49*x^ \\
& 2 - 151*x + 200) - 42221626349390796111458673620*x + 559226839064 \\
& 77875644316124000) - 17399055965465703693781599224*\sqrt{2}*(2*x^2 \\
& - x + 3) - 24605980918850265283499094560*x + 7381794275655079585 \\
& 0497283680)/(197716545062110269247518173*\sqrt{2}*x^2 - 2796134195 \\
& 32389378221580620*x^2)) - 3*\sqrt{129754513)*\sqrt{31}*(12975451300 \\
& *x^4 + 15570541560*x^3 + 15051523508*x^2 - 366990269*\sqrt{2}*(25* \\
& x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 6228216624*x + 2076072208)*\log \\
& (606104411179218084*\sqrt{2}*(46*232562^{(1/4)}*\sqrt{2*x^2 - x + 3} \\
& *(\sqrt{2}*(386989138339976299220055293849*x + 1602961495914960605 \\
& 82087946227) - 547285287931472359802143240076*x - 226692988748480 \\
& 238637967347622)*\sqrt{((366990269*\sqrt{2} - 519018052)/(1904745745 \\
& 19335988*\sqrt{2} - 269371726691629713)) - 49211961837700530566998 \\
& 189120*x^2 - \sqrt{2}*(13701057557087079532857450380*x^2 - 1977165 \\
& 45062110269247518173*\sqrt{2}*(49*x^2 - 151*x + 200) - 42221626349 \\
& 390796111458673620*x + 55922683906477875644316124000) + 173990559 \\
& 65465703693781599224*\sqrt{2}*(2*x^2 - x + 3) + 246059809188502652 \\
& 83499094560*x - 73817942756550795850497283680)/(19771654506211026 \\
& 9247518173*\sqrt{2}*x^2 - 279613419532389378221580620*x^2)))/((129 \\
& 75451300*x^4 + 15570541560*x^3 + 15051523508*x^2 - 366990269*\sqrt{2} \\
& (2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 6228216624*x + 207607 \\
& 2208)*\sqrt{((366990269*\sqrt{2} - 519018052)/(190474574519335988*s \\
& \text{qrt}(2) - 269371726691629713))}
\end{aligned}$$

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

$$\int \frac{(2x^2 - x + 3)^{\frac{3}{2}}}{(5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)`

[Out] `Integral((2*x**2 - x + 3)**(3/2)/(5*x**2 + 3*x + 2)**3, x)`

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")`

[Out] `Exception raised: RuntimeError`

$$3.72 \quad \int (3 - x + 2x^2)^{5/2} (2 + 3x + 5x^2)^4 dx$$

Optimal. Leaf size=254

$$\begin{aligned} & \frac{122595067 (2x^2 - x + 3)^{7/2} x^2}{19169280} + \frac{112244125 (2x^2 - x + 3)^{7/2} x}{122683392} \\ & + \frac{25250178739 (2x^2 - x + 3)^{7/2}}{5725224960} - \frac{401135647(1 - 4x) (2x^2 - x + 3)^{5/2}}{335544320} \\ & - \frac{9226119881(1 - 4x) (2x^2 - x + 3)^{3/2}}{2147483648} - \frac{636602271789(1 - 4x)\sqrt{2x^2 - x + 3}}{34359738368} \\ & + \frac{625}{28} (2x^2 - x + 3)^{7/2} x^7 + \frac{13875}{208} (2x^2 - x + 3)^{7/2} x^6 + \frac{1046225 (2x^2 - x + 3)^{7/2} x^5}{9984} + \frac{3684995 (2x^2 - x + 3)^{7/2} x^4}{39936} + \frac{23460839}{5725224960} \end{aligned}$$

[Out] $(-636602271789*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/34359738368 - (9226119881*(1 - 4*x)*(3 - x + 2*x^2)^{(3/2)})/2147483648 - (401135647*(1 - 4*x)*(3 - x + 2*x^2)^{(5/2)})/335544320 + (25250178739*(3 - x + 2*x^2)^{(7/2)})/5725224960 + (112244125*x*(3 - x + 2*x^2)^{(7/2)})/122683392 + (122595067*x^2*(3 - x + 2*x^2)^{(7/2)})/19169280 + (23460839*x^3*(3 - x + 2*x^2)^{(7/2)})/532480 + (3684995*x^4*(3 - x + 2*x^2)^{(7/2)})/39936 + (1046225*x^5*(3 - x + 2*x^2)^{(7/2)})/9984 + (13875*x^6*(3 - x + 2*x^2)^{(7/2)})/208 + (625*x^7*(3 - x + 2*x^2)^{(7/2)})/28 - (14641852251147*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(68719476736*\text{Sqrt}[2])$

Rubi [A] time = 0.604329, antiderivative size = 254, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{122595067 (2x^2 - x + 3)^{7/2} x^2}{19169280} + \frac{112244125 (2x^2 - x + 3)^{7/2} x}{122683392} \\ & + \frac{25250178739 (2x^2 - x + 3)^{7/2}}{5725224960} - \frac{401135647(1 - 4x) (2x^2 - x + 3)^{5/2}}{335544320} \\ & - \frac{9226119881(1 - 4x) (2x^2 - x + 3)^{3/2}}{2147483648} - \frac{636602271789(1 - 4x)\sqrt{2x^2 - x + 3}}{34359738368} \\ & + \frac{625}{28} (2x^2 - x + 3)^{7/2} x^7 + \frac{13875}{208} (2x^2 - x + 3)^{7/2} x^6 + \frac{1046225 (2x^2 - x + 3)^{7/2} x^5}{9984} + \frac{3684995 (2x^2 - x + 3)^{7/2} x^4}{39936} + \frac{23460839}{5725224960} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3 - x + 2*x^2)^{(5/2)}*(2 + 3*x + 5*x^2)^4, x]$

[Out] $(-636602271789*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/34359738368 - (9226119881*(1 - 4*x)*(3 - x + 2*x^2)^{(3/2)})/2147483648 - (401135647*(1 - 4*x)*(3 - x + 2*x^2)^{(5/2)})/335544320 + (25250178739*(3 - x + 2*x^2)^{(7/2)})/5725224960 + (112244125*x*(3 - x + 2*x^2)^{(7/2)})/122683392 + (122595067*x^2*(3 - x + 2*x^2)^{(7/2)})/19169280 + (23460839*x^3*(3 - x + 2*x^2)^{(7/2)})/532480 + (3684995*x^4*(3 - x + 2*x^2)^{(7/2)})/39936 + (1046225*x^5*(3 - x + 2*x^2)^{(7/2)})/9984 + (13875*x^6*(3 - x + 2*x^2)^{(7/2)})/208 + (625*x^7*(3 - x + 2*x^2)^{(7/2)})/28 - (14641852251147*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(68719476736*\text{Sqrt}[2])$

$$1 - 4*x)^*(3 - x + 2*x^2)^{(5/2)}/335544320 + (25250178739*(3 - x + 2*x^2)^{(7/2)})/5725224960 + (112244125*x*(3 - x + 2*x^2)^{(7/2)})/122683392 + (122595067*x^2*(3 - x + 2*x^2)^{(7/2)})/19169280 + (23460839*x^3*(3 - x + 2*x^2)^{(7/2)})/532480 + (3684995*x^4*(3 - x + 2*x^2)^{(7/2)})/39936 + (1046225*x^5*(3 - x + 2*x^2)^{(7/2)})/9984 + (13875*x^6*(3 - x + 2*x^2)^{(7/2)})/208 + (625*x^7*(3 - x + 2*x^2)^{(7/2)})/28 - (14641852251147*ArcSinh[(1 - 4*x)/Sqrt[23]])/(68719476736*Sqrt[2])$$

Rubi in Sympy [A] time = 128.005, size = 246, normalized size = 0.97

$$\frac{\left(-\frac{68243649705x}{8} + \frac{362629622751}{32}\right) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^3}{21621600000} - \frac{\left(-\frac{945065x}{2} + \frac{11877899}{8}\right) (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^3}{4804800} - \frac{636602271789(-4x + 1)\sqrt{2x^2 - x + 3}}{34359738368} + \frac{\left(130x + \frac{309}{2}\right) (2x^2 - x + 3)^{\frac{7}{2}} (5x^2 + 3x + 2)^3}{728} + \frac{\left(\frac{1719653051422845x}{32} + \frac{2254414002500583}{128}\right) (2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^2}{24216192000000} + \frac{\left(\frac{7211421563490750375x}{128} + \frac{41400525906772259535}{512}\right) \left(-\frac{288456862539630015x^2}{256} - \frac{382553649481777389x}{256} + \frac{30255323481274815}{128}\right) (2x^2 - x + 3)^{\frac{3}{2}}}{3274371922020603774470100000000} + \frac{\left(\frac{52558098024608188084793573247595880295x}{131072} + \frac{1598024049869061092244937230038073366225}{524288}\right) (2x^2 - x + 3)^{\frac{3}{2}}}{157169852256988981174564800000000} + \frac{14641852251147\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{137438953472}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**4,x)`

[Out]
$$\begin{aligned} & -(-68243649705*x/8 + 362629622751/32)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**3/21621600000 - (-945065*x/2 + 11877899/8)*(2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**3/4804800 - 636602271789*(-4*x + 1)*sqrt(2*x**2 - x + 3)/34359738368 + (130*x + 309/2)*(2*x**2 - x + 3)**(7/2)*(5*x**2 + 3*x + 2)**3/728 + (1719653051422845*x/32 + 2254414002500583/128)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2/24216192000000 + (7211421563490750375*x/128 + 41400525906772259535/512)*(-288456862539630015*x**2/256 - 382553649481777389*x/256 + 30255323481274815/128)*(2*x**2 - x + 3)**(3/2)/3274371922020603774470100000000 + (52558098024608188084793573247595880295*x/131072 + 1598024049869061092244937230038073366225/524288)*(2*x**2 - x + 3)**(3/2)/157169852256988981174564800000000 + 14641852251147*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/137438953472 \end{aligned}$$

Mathematica [A] time = 0.15309, size = 105, normalized size = 0.41

$$59958384968446965\sqrt{2} \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right) + 4\sqrt{2x^2-x+3} (25125558681600000x^{13} + 37398427729920000x^{12} + 13723346613000000x^{11} + 25125558681600000x^{10} + 37398427729920000x^9 + 204932411660697600x^8 + 137233466130432000x^7 + 37398427729920000x^6 + 25125558681600000x^5 + 37398427729920000x^4 + 204932411660697600x^3 + 137233466130432000x^2 + 37398427729920000x + 25125558681600000)$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^4, x]

[Out] (4*sqrt[3 - x + 2*x^2]*(10820567498568669 + 12071614275862524*x + 50064174038215008*x^2 + 142490931553577856*x^3 + 257786732552566784*x^4 + 405468382284161024*x^5 + 485091164642279424*x^6 + 530502956133122048*x^7 + 439064558846345216*x^8 + 363646430503501824*x^9 + 204932411660697600*x^10 + 137233466130432000*x^11 + 37398427729920000*x^12 + 25125558681600000*x^13) + 59958384968446965*sqrt[2]*ArcSinh[(-1 + 4*x)/sqrt[23]])/562812514467840

Maple [A] time = 0.054, size = 204, normalized size = 0.8

$$\begin{aligned} & \frac{1604542588x - 401135647}{335544320} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{36904479524x - 9226119881}{2147483648} (2x^2 - x + 3)^{\frac{3}{2}} \\ & + \frac{2546409087156x - 636602271789}{34359738368} \sqrt{2x^2 - x + 3} \\ & + \frac{14641852251147\sqrt{2}}{137438953472} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{25250178739}{5725224960} (2x^2 - x + 3)^{\frac{7}{2}} \\ & + \frac{112244125x}{122683392} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{122595067x^2}{19169280} (2x^2 - x + 3)^{\frac{7}{2}} \\ & + \frac{23460839x^3}{532480} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{3684995x^4}{39936} (2x^2 - x + 3)^{\frac{7}{2}} \\ & + \frac{1046225x^5}{9984} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{13875x^6}{208} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{625x^7}{28} (2x^2 - x + 3)^{\frac{7}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2)^4, x)

[Out] 401135647/335544320*(4*x-1)*(2*x^2-x+3)^(5/2)+9226119881/2147483648*(4*x-1)*(2*x^2-x+3)^(3/2)+636602271789/34359738368*(4*x-1)*(2*x^2-x+3)^(1/2)+14641852251147/137438953472*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+25250178739/5725224960*(2*x^2-x+3)^(7/2)+112244125/122683392*x*(2*x^2-x+3)^(7/2)+122595067/19169280*x^2*(2*x^2-x+3)^(7/2)+23460839/532480*x^3*(2*x^2-x+3)^(7/2)+3684995/39936*x^4*(2*x^2-x+3)^(7/2)+1046225/9984*x^5*(2*x^2-x+3)^(7/2)+13875/208*x^6*(2*x^2-x+3)^(7/2)+625/28*x^7*(2*x^2-x+3)^(7/2)

$$6 * (2 * x^2 - x + 3)^{(7/2)} + 625/28 * x^7 * (2 * x^2 - x + 3)^{(7/2)}$$

Maxima [A] time = 0.799668, size = 317, normalized size = 1.25

$$\begin{aligned} & \frac{625}{28} (2x^2 - x + 3)^{\frac{7}{2}} x^7 + \frac{13875}{208} (2x^2 - x + 3)^{\frac{7}{2}} x^6 + \frac{1046225}{9984} (2x^2 - x + 3)^{\frac{7}{2}} x^5 \\ & + \frac{3684995}{39936} (2x^2 - x + 3)^{\frac{7}{2}} x^4 + \frac{23460839}{532480} (2x^2 - x + 3)^{\frac{7}{2}} x^3 + \frac{122595067}{19169280} (2x^2 - x + 3)^{\frac{7}{2}} x^2 \\ & + \frac{112244125}{122683392} (2x^2 - x + 3)^{\frac{7}{2}} x + \frac{25250178739}{5725224960} (2x^2 - x + 3)^{\frac{7}{2}} \\ & + \frac{401135647}{83886080} (2x^2 - x + 3)^{\frac{5}{2}} x - \frac{401135647}{335544320} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{9226119881}{536870912} (2x^2 - x + 3)^{\frac{3}{2}} x \\ & - \frac{9226119881}{2147483648} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{636602271789}{8589934592} \sqrt{2x^2 - x + 3} x \\ & + \frac{14641852251147}{137438953472} \sqrt{2} \operatorname{arsinh} \left(\frac{1}{23} \sqrt{23(4x - 1)} \right) - \frac{636602271789}{34359738368} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")

[Out] 625/28*(2*x^2 - x + 3)^(7/2)*x^7 + 13875/208*(2*x^2 - x + 3)^(7/2)*x^6 + 1046225/9984*(2*x^2 - x + 3)^(7/2)*x^5 + 3684995/39936*(2*x^2 - x + 3)^(7/2)*x^4 + 23460839/532480*(2*x^2 - x + 3)^(7/2)*x^3 + 122595067/19169280*(2*x^2 - x + 3)^(7/2)*x^2 + 112244125/122683392*(2*x^2 - x + 3)^(7/2)*x + 25250178739/5725224960*(2*x^2 - x + 3)^(7/2) + 401135647/83886080*(2*x^2 - x + 3)^(5/2)*x - 401135647/335544320*(2*x^2 - x + 3)^(5/2) + 9226119881/536870912*(2*x^2 - x + 3)^(3/2)*x - 9226119881/2147483648*(2*x^2 - x + 3)^(3/2) + 636602271789/8589934592*sqrt(2*x^2 - x + 3)*x + 14641852251147/137438953472*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 636602271789/34359738368*sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.292602, size = 170, normalized size = 0.67

$$\frac{1}{1125625028935680} \sqrt{2} \left(4 \sqrt{2} (25125558681600000 x^{13} + 37398427729920000 x^{12} + 137233466130432000 x^{11} + 204932411660697000 x^{10} + 137233466130432000 x^9 + 37398427729920000 x^8 + 25125558681600000 x^7 + 1125625028935680 x^6) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")

[Out] 1/1125625028935680*sqrt(2)*(4*sqrt(2)*(25125558681600000*x^13 + 37398427729920000*x^12 + 137233466130432000*x^11 + 204932411660697000*x^10 + 137233466130432000*x^9 + 37398427729920000*x^8 + 25125558681600000*x^7 + 1125625028935680*x^6))

$600x^{10} + 363646430503501824x^9 + 439064558846345216x^8 + 530502956133122048x^7 + 485091164642279424x^6 + 405468382284161024x^5 + 257786732552566784x^4 + 142490931553577856x^3 + 50064174038215008x^2 + 12071614275862524x + 10820567498568669) \sqrt{2x^2 - x + 3} + 59958384968446965 \log(-\sqrt{2}(32x^2 - 16x + 25) - 8\sqrt{2x^2 - x + 3}(4x - 1))$

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

$$\int (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^4 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**4,x)

[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**4, x)

GIAC/XCAS [A] time = 0.273533, size = 153, normalized size = 0.6

$$\frac{1}{140703128616960} (4(8(4(16(4(8(4(32(12(200(20(240(260x + 387)x + 340823)x + 10179103)x + 3612502719)x + 52340574127)x + 2023708176167)x + 7401903757359)x + 49495652134297)x + 125872428004183)x + 1113210402762327)x + 1564505438694219)x + 3017903568965631)x + 10820567498568669) \sqrt{2x^2 - x + 3} - \frac{14641852251147}{137438953472} \sqrt{2} \ln(-2\sqrt{2}(\sqrt{2}x - \sqrt{2x^2 - x + 3}) + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")

[Out] 1/140703128616960*(4*(8*(4*(16*(4*(8*(4*(32*(12*(200*(20*(240*(260*x + 387)*x + 340823)*x + 10179103)*x + 3612502719)*x + 52340574127)*x + 2023708176167)*x + 7401903757359)*x + 49495652134297)*x + 125872428004183)*x + 1113210402762327)*x + 1564505438694219)*x + 3017903568965631)*x + 10820567498568669)*sqrt(2*x^2 - x + 3) - 14641852251147/137438953472*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.73 \quad \int (3 - x + 2x^2)^{5/2} (2 + 3x + 5x^2)^3 dx$$

Optimal. Leaf size=212

$$\frac{80483(2x^2 - x + 3)^{7/2}x^2}{9216} + \frac{509257(2x^2 - x + 3)^{7/2}x}{294912} - \frac{1696165(2x^2 - x + 3)^{7/2}}{2752512}$$

$$- \frac{57915(1 - 4x)(2x^2 - x + 3)^{5/2}}{2097152} - \frac{6660225(1 - 4x)(2x^2 - x + 3)^{3/2}}{67108864} - \frac{459555525(1 - 4x)\sqrt{2x^2 - x + 3}}{1073741824}$$

$$+ \frac{125}{24}(2x^2 - x + 3)^{7/2}x^5 + \frac{1175}{96}(2x^2 - x + 3)^{7/2}x^4 + \frac{3823}{256}(2x^2 - x + 3)^{7/2}x^3 - \frac{10569777075 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2147483648\sqrt{2}}$$

[Out] (-459555525*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1073741824 - (6660225*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/67108864 - (57915*(1 - 4*x)*(3 - x + 2*x^2)^(5/2))/2097152 - (1696165*(3 - x + 2*x^2)^(7/2))/2752512 + (509257*x*(3 - x + 2*x^2)^(7/2))/294912 + (80483*x^2*(3 - x + 2*x^2)^(7/2))/9216 + (3823*x^3*(3 - x + 2*x^2)^(7/2))/256 + (1175*x^4*(3 - x + 2*x^2)^(7/2))/96 + (125*x^5*(3 - x + 2*x^2)^(7/2))/24 - (10569777075*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2147483648*Sqrt[2])

Rubi [A] time = 0.369172, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{80483(2x^2 - x + 3)^{7/2}x^2}{9216} + \frac{509257(2x^2 - x + 3)^{7/2}x}{294912} - \frac{1696165(2x^2 - x + 3)^{7/2}}{2752512}$$

$$- \frac{57915(1 - 4x)(2x^2 - x + 3)^{5/2}}{2097152} - \frac{6660225(1 - 4x)(2x^2 - x + 3)^{3/2}}{67108864} - \frac{459555525(1 - 4x)\sqrt{2x^2 - x + 3}}{1073741824}$$

$$+ \frac{125}{24}(2x^2 - x + 3)^{7/2}x^5 + \frac{1175}{96}(2x^2 - x + 3)^{7/2}x^4 + \frac{3823}{256}(2x^2 - x + 3)^{7/2}x^3 - \frac{10569777075 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2147483648\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3, x]

[Out] (-459555525*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1073741824 - (6660225*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/67108864 - (57915*(1 - 4*x)*(3 - x + 2*x^2)^(5/2))/2097152 - (1696165*(3 - x + 2*x^2)^(7/2))/2752512 + (509257*x*(3 - x + 2*x^2)^(7/2))/294912 + (80483*x^2*(3 - x + 2*x^2)^(7/2))/9216 + (3823*x^3*(3 - x + 2*x^2)^(7/2))/256 + (1175*x^4*(3 - x + 2*x^2)^(7/2))/96 + (125*x^5*(3 - x + 2*x^2)^(7/2))/24 - (10569777075*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2147483648*Sqrt[2])

Rubi in Sympy [A] time = 96.8315, size = 221, normalized size = 1.04

$$\begin{aligned}
 & \frac{32 \left(-\frac{12567702364502818458541932241695x}{8192} + \frac{5982091748009989536759139882665}{32768} \right) (2x^2 - x + 3)^{\frac{3}{2}} \left(\frac{3139688559102733218339x^2}{1024} + \frac{2492126897929380}{1024} \right)}{7844060888663380369127335209622566358625214375} \\
 & - \frac{\left(-\frac{647955x}{2} + \frac{5493279}{8} \right) (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^2}{2376000} \\
 & - \frac{459555525(-4x + 1)\sqrt{2x^2 - x + 3}}{1073741824} + \frac{\left(110x + \frac{253}{2}\right) (2x^2 - x + 3)^{\frac{7}{2}} (5x^2 + 3x + 2)^2}{528} \\
 & + \frac{\left(\frac{28019950035x}{8} + \frac{111669293241}{32}\right) (2x^2 - x + 3)^{\frac{3}{2}} \left(\frac{800570001x^2}{16} - \frac{390192693x}{16} + \frac{62395707}{8}\right)^2}{666228363397935031039500} \\
 & + \frac{2 \left(\frac{4592512541975180182314768057999433328279346523437598275x}{33554432} + \frac{15162300112699042851601654176430304348808713213789752725}{134217728} \right) (2x^2 - x + 3)^{\frac{3}{2}}}{23532182665990141107382005628867699075875643125} \\
 & + \frac{10569777075\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4294967296}
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**3,x)`

[Out] `-32*(-12567702364502818458541932241695*x/8192 + 5982091748009989536759139882665/32768)*(2*x**2 - x + 3)**(3/2)*(3139688559102733218339*x**2/1024 + 249212689792938092133*x/1024 + 1101764683633170644703/512)/7844060888663380369127335209622566358625214375 - (-647955*x/2 + 5493279/8)*(2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2/2376000 - 459555525*(-4*x + 1)*sqrt(2*x**2 - x + 3)/1073741824 + (110*x + 253/2)*(2*x**2 - x + 3)**(7/2)*(5*x**2 + 3*x + 2)**2/528 + (28019950035*x/8 + 111669293241/32)*(2*x**2 - x + 3)**(3/2)*(800570001*x**2/16 - 390192693*x/16 + 62395707/8)**2/666228363397935031039500 - 2*(4592512541975180182314768057999433328279346523437598275*x/33554432 + 15162300112699042851601654176430304348808713213789752725/134217728)*(2*x**2 - x + 3)**(3/2)/23532182665990141107382005628867699075875643125 + 10569777075*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/4294967296`

Mathematica [A] time = 0.125707, size = 95, normalized size = 0.45

$$\frac{665895955725\sqrt{2} \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right) + 4\sqrt{2x^2 - x + 3} (2818572288000x^{11} + 2395786444800x^{10} + 12943588589568x^9 + 1434189)}{1}$$

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3, x]

[Out] (4*Sqrt[3 - x + 2*x^2]*(-1191399152715 + 4560943728924*x + 10060731582048*x^2 + 20384824684416*x^3 + 26186527209472*x^4 + 34378613923840*x^5 + 28347538538496*x^6 + 27835561148416*x^7 + 14341894045696*x^8 + 12943588589568*x^9 + 2395786444800*x^10 + 281857228800*x^11) + 665895955725*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/270582939648

Maple [A] time = 0.01, size = 170, normalized size = 0.8

$$\begin{aligned} & \frac{231660x - 57915}{2097152} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{26640900x - 6660225}{67108864} (2x^2 - x + 3)^{\frac{3}{2}} \\ & + \frac{1838222100x - 459555525}{1073741824} \sqrt{2x^2 - x + 3} + \frac{10569777075\sqrt{2}}{4294967296} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) \\ & - \frac{1696165}{2752512} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{509257x}{294912} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{80483x^2}{9216} (2x^2 - x + 3)^{\frac{7}{2}} \\ & + \frac{3823x^3}{256} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{1175x^4}{96} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{125x^5}{24} (2x^2 - x + 3)^{\frac{7}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2)^3, x)

[Out] 57915/2097152*(4*x-1)*(2*x^2-x+3)^(5/2)+6660225/67108864*(4*x-1)*(2*x^2-x+3)^(3/2)+459555525/1073741824*(4*x-1)*(2*x^2-x+3)^(1/2)+10569777075/4294967296*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-1696165/2752512*(2*x^2-x+3)^(7/2)+509257/294912*x*(2*x^2-x+3)^(7/2)+80483/9216*x^2*(2*x^2-x+3)^(7/2)+3823/256*x^3*(2*x^2-x+3)^(7/2)+1175/96*x^4*(2*x^2-x+3)^(7/2)+125/24*x^5*(2*x^2-x+3)^(7/2)

Maxima [A] time = 0.790145, size = 271, normalized size = 1.28

$$\begin{aligned} & \frac{125}{24} (2x^2 - x + 3)^{\frac{7}{2}} x^5 + \frac{1175}{96} (2x^2 - x + 3)^{\frac{7}{2}} x^4 + \frac{3823}{256} (2x^2 - x + 3)^{\frac{7}{2}} x^3 \\ & + \frac{80483}{9216} (2x^2 - x + 3)^{\frac{7}{2}} x^2 + \frac{509257}{294912} (2x^2 - x + 3)^{\frac{7}{2}} x - \frac{1696165}{2752512} (2x^2 - x + 3)^{\frac{7}{2}} \\ & + \frac{57915}{524288} (2x^2 - x + 3)^{\frac{5}{2}} x - \frac{57915}{2097152} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{6660225}{16777216} (2x^2 - x + 3)^{\frac{3}{2}} x \\ & - \frac{6660225}{67108864} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{459555525}{268435456} \sqrt{2x^2 - x + 3} x \\ & + \frac{10569777075}{4294967296} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{459555525}{1073741824} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")`

[Out] $125/24*(2*x^2 - x + 3)^{(7/2)}*x^5 + 1175/96*(2*x^2 - x + 3)^{(7/2)}*x^4 + 3823/256*(2*x^2 - x + 3)^{(7/2)}*x^3 + 80483/9216*(2*x^2 - x + 3)^{(7/2)}*x^2 + 509257/294912*(2*x^2 - x + 3)^{(7/2)}*x - 1696165/2752512*(2*x^2 - x + 3)^{(7/2)} + 57915/524288*(2*x^2 - x + 3)^{(5/2)}*x - 57915/2097152*(2*x^2 - x + 3)^{(5/2)} + 6660225/16777216*(2*x^2 - x + 3)^{(3/2)}*x - 6660225/67108864*(2*x^2 - x + 3)^{(3/2)} + 459555525/268435456*\sqrt{2*x^2 - x + 3}*x + 10569777075/4294967296*\sqrt{2}*\operatorname{arcsinh}(1/23*\sqrt{23}*(4*x - 1)) - 459555525/1073741824*\sqrt{2*x^2 - x + 3}$

Fricas [A] time = 0.286218, size = 157, normalized size = 0.74

$\frac{1}{541165879296} \sqrt{2} \left(4 \sqrt{2} (2818572288000 x^{11} + 2395786444800 x^{10} + 12943588589568 x^9 + 14341894045696 x^8 + 27835561148416 x^7 + 28347538538496 x^6 + 34378613923840 x^5 + 26186527209472 x^4 + 20384824684416 x^3 + 10060731582048 x^2 + 4560943728924 x - 1191399152715) \sqrt{2*x^2 - x + 3} + 665895955725 \log(-\sqrt{2}*(32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)) \right)$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")`

[Out] $1/541165879296*\sqrt{2}*(4*\sqrt{2}*(2818572288000*x^{11} + 2395786448000*x^{10} + 12943588589568*x^9 + 14341894045696*x^8 + 27835561148416*x^7 + 28347538538496*x^6 + 34378613923840*x^5 + 26186527209472*x^4 + 20384824684416*x^3 + 10060731582048*x^2 + 4560943728924*x - 1191399152715)*\sqrt{2*x^2 - x + 3} + 665895955725*\log(-\sqrt{2}*(32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)))$

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

$$\int (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**3,x)`

[Out] `Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**3, x)`

GIAC/XCAS [A] time = 0.273106, size = 139, normalized size = 0.66

$$\frac{1}{67645734912} (4(8(4(16(4(8(28(32(12(200(20x+17)x+18369)x+244241)x+15169177)x+432549111)x+4196608145) \\ - \frac{10569777075}{4294967296} \sqrt{2} \ln(-2\sqrt{2}(\sqrt{2}x - \sqrt{2x^2 - x + 3}) + 1))$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")

[Out] 1/67645734912*(4*(8*(4*(16*(4*(8*(28*(32*(12*(200*(20*x + 17)*x + 18369)*x + 244241)*x + 15169177)*x + 432549111)*x + 4196608145)*x + 12786390239)*x + 159256442847)*x + 314397861939)*x + 1140235932231)*x - 1191399152715)*sqrt(2*x^2 - x + 3) - 10569777075/4294967296*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.74 \quad \int (3 - x + 2x^2)^{5/2} (2 + 3x + 5x^2)^2 dx$$

Optimal. Leaf size=170

$$\begin{aligned} & \frac{305}{144}x^2(2x^2 - x + 3)^{7/2} + \frac{8467x(2x^2 - x + 3)^{7/2}}{4608} + \frac{23225(2x^2 - x + 3)^{7/2}}{43008} \\ & - \frac{1547(1 - 4x)(2x^2 - x + 3)^{5/2}}{98304} - \frac{177905(1 - 4x)(2x^2 - x + 3)^{3/2}}{3145728} \\ & - \frac{4091815(1 - 4x)\sqrt{2x^2 - x + 3}}{16777216} + \frac{5}{4}x^3(2x^2 - x + 3)^{7/2} - \frac{94111745 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{33554432\sqrt{2}} \end{aligned}$$

[Out] $(-4091815*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/16777216 - (177905*(1 - 4*x)*(3 - x + 2*x^2)^{(3/2)})/3145728 - (1547*(1 - 4*x)*(3 - x + 2*x^2)^{(5/2)})/98304 + (23225*(3 - x + 2*x^2)^{(7/2)})/43008 + (8467*x*(3 - x + 2*x^2)^{(7/2)})/4608 + (305*x^2*(3 - x + 2*x^2)^{(7/2)})/144 + (5*x^3*(3 - x + 2*x^2)^{(7/2)})/4 - (94111745*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(33554432*\text{Sqrt}[2])$

Rubi [A] time = 0.233033, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{305}{144}x^2(2x^2 - x + 3)^{7/2} + \frac{8467x(2x^2 - x + 3)^{7/2}}{4608} + \frac{23225(2x^2 - x + 3)^{7/2}}{43008} \\ & - \frac{1547(1 - 4x)(2x^2 - x + 3)^{5/2}}{98304} - \frac{177905(1 - 4x)(2x^2 - x + 3)^{3/2}}{3145728} \\ & - \frac{4091815(1 - 4x)\sqrt{2x^2 - x + 3}}{16777216} + \frac{5}{4}x^3(2x^2 - x + 3)^{7/2} - \frac{94111745 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{33554432\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(3 - x + 2*x^2)^{(5/2)}*(2 + 3*x + 5*x^2)^2, x]$

[Out] $(-4091815*(1 - 4*x)*\text{Sqrt}[3 - x + 2*x^2])/16777216 - (177905*(1 - 4*x)*(3 - x + 2*x^2)^{(3/2)})/3145728 - (1547*(1 - 4*x)*(3 - x + 2*x^2)^{(5/2)})/98304 + (23225*(3 - x + 2*x^2)^{(7/2)})/43008 + (8467*x*(3 - x + 2*x^2)^{(7/2)})/4608 + (305*x^2*(3 - x + 2*x^2)^{(7/2)})/144 + (5*x^3*(3 - x + 2*x^2)^{(7/2)})/4 - (94111745*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(33554432*\text{Sqrt}[2])$

Rubi in Sympy [A] time = 25.2146, size = 146, normalized size = 0.86

$$\begin{aligned} & \frac{\left(-\frac{83321x}{2} + \frac{4649}{8}\right) (2x^2 - x + 3)^{\frac{7}{2}}}{80640} - \frac{1547(-4x + 1) (2x^2 - x + 3)^{\frac{5}{2}}}{98304} \\ & - \frac{177905(-4x + 1) (2x^2 - x + 3)^{\frac{3}{2}}}{3145728} - \frac{4091815(-4x + 1) \sqrt{2x^2 - x + 3}}{16777216} \\ & + \frac{\left(90x + \frac{197}{2}\right) (2x^2 - x + 3)^{\frac{7}{2}} (5x^2 + 3x + 2)}{360} + \frac{94111745\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{67108864} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**2,x)`

[Out] `-(-83321*x/2 + 4649/8)*(2*x**2 - x + 3)**(7/2)/80640 - 1547*(-4*x + 1)*(2*x**2 - x + 3)**(5/2)/98304 - 177905*(-4*x + 1)*(2*x**2 - x + 3)**(3/2)/3145728 - 4091815*(-4*x + 1)*sqrt(2*x**2 - x + 3)/16777216 + (90*x + 197/2)*(2*x**2 - x + 3)**(7/2)*(5*x**2 + 3*x + 2)/360 + 94111745*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/67108864`

Mathematica [A] time = 0.110783, size = 85, normalized size = 0.5

$$4\sqrt{2x^2 - x + 3} (10569646080x^9 + 2055208960x^8 + 44163137536x^7 + 26401898496x^6 + 75389820928x^5 + 57147467776x^4 + 75389820928x^3 + 26401898496x^2 + 44163137536x + 10569646080)$$

4227858432

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^2,x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(14824182519 + 39533249652*x + 42992644128*x^2 + 77872272000*x^3 + 57147467776*x^4 + 75389820928*x^5 + 26401898496*x^6 + 44163137536*x^7 + 2055208960*x^8 + 10569646080*x^9) + 5929039935*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/4227858432`

Maple [A] time = 0.01, size = 136, normalized size = 0.8

$$\begin{aligned} & \frac{6188x - 1547}{98304} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{711620x - 177905}{3145728} (2x^2 - x + 3)^{\frac{3}{2}} \\ & + \frac{16367260x - 4091815}{16777216} \sqrt{2x^2 - x + 3} + \frac{94111745\sqrt{2}}{67108864} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) \\ & + \frac{23225}{43008} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{8467x}{4608} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{305x^2}{144} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{5x^3}{4} (2x^2 - x + 3)^{\frac{7}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2)^2,x)`

[Out] $1547/98304*(4*x-1)*(2*x^2-x+3)^{(5/2)}+177905/3145728*(4*x-1)*(2*x^2-x+3)^{(3/2)}+4091815/16777216*(4*x-1)*(2*x^2-x+3)^{(1/2)}+94111745/67108864*2^{(1/2)}*\operatorname{arsinh}(4/23*23^{(1/2)}*(x-1/4))+23225/43008*(2*x^2-x+3)^{(7/2)}+8467/4608*x*(2*x^2-x+3)^{(7/2)}+305/144*x^2*(2*x^2-x+3)^{(7/2)}+5/4*x^3*(2*x^2-x+3)^{(7/2)}$

Maxima [A] time = 0.783013, size = 225, normalized size = 1.32

$$\begin{aligned} & \frac{5}{4}(2x^2-x+3)^{\frac{7}{2}}x^3 + \frac{305}{144}(2x^2-x+3)^{\frac{7}{2}}x^2 + \frac{8467}{4608}(2x^2-x+3)^{\frac{7}{2}}x \\ & + \frac{23225}{43008}(2x^2-x+3)^{\frac{7}{2}} + \frac{1547}{24576}(2x^2-x+3)^{\frac{5}{2}}x - \frac{1547}{98304}(2x^2-x+3)^{\frac{5}{2}} \\ & + \frac{177905}{786432}(2x^2-x+3)^{\frac{3}{2}}x - \frac{177905}{3145728}(2x^2-x+3)^{\frac{3}{2}} + \frac{4091815}{4194304}\sqrt{2x^2-x+3x} \\ & + \frac{94111745}{67108864}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \frac{4091815}{16777216}\sqrt{2x^2-x+3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2+3*x+2)^2*(2*x^2-x+3)^(5/2),x, algorithm="maxima")`

[Out] $5/4*(2*x^2-x+3)^{(7/2)}*x^3 + 305/144*(2*x^2-x+3)^{(7/2)}*x^2 + 8467/4608*(2*x^2-x+3)^{(7/2)}*x + 23225/43008*(2*x^2-x+3)^{(7/2)} + 1547/24576*(2*x^2-x+3)^{(5/2)}*x - 1547/98304*(2*x^2-x+3)^{(5/2)} + 177905/786432*(2*x^2-x+3)^{(3/2)}*x - 177905/3145728*(2*x^2-x+3)^{(3/2)} + 4091815/4194304*\operatorname{sqrt}(2*x^2-x+3)*x + 94111745/67108864*\operatorname{sqrt}(2)*\operatorname{arsinh}(1/23*\operatorname{sqrt}(23)*(4*x-1)) - 4091815/16777216*\operatorname{sqrt}(2*x^2-x+3)$

Fricas [A] time = 0.277675, size = 143, normalized size = 0.84

$$\frac{1}{8455716864}\sqrt{2}\left(4\sqrt{2}(10569646080x^9 + 2055208960x^8 + 44163137536x^7 + 26401898496x^6 + 75389820928x^5 + 571474672x^4 + 10569646080x^3 + 2055208960x^2 + 44163137536x + 26401898496)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2+3*x+2)^2*(2*x^2-x+3)^(5/2),x, algorithm="fricas")`

[Out] $1/8455716864*\operatorname{sqrt}(2)*(4*\operatorname{sqrt}(2)*(10569646080*x^9 + 2055208960*x^8 + 44163137536*x^7 + 26401898496*x^6 + 75389820928*x^5 + 571474672*x^4 + 10569646080*x^3 + 2055208960*x^2 + 44163137536*x + 26401898496))$

$$776x^4 + 77872272000x^3 + 42992644128x^2 + 39533249652x + 14824182519) \sqrt{2x^2 - x + 3} + 5929039935 \log(-\sqrt{2}(32x^2 - 16x + 25) - 8\sqrt{2x^2 - x + 3}(4x - 1))$$

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

$$\int (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**2,x)

[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2, x)

GIAC/XCAS [A] time = 0.269756, size = 126, normalized size = 0.74

$$\frac{1}{1056964608} (4(8(4(16(4(8(28(160(36x+7)x+24067)x+402861)x+9202859)x+27904037)x+608377125)x+13435209)x+9883312413)x+14824182519) \sqrt{2x^2-x+3} - 94111745/67108864 \sqrt{2} \ln(-2\sqrt{2}(\sqrt{2}x - \sqrt{2x^2-x+3}) + 1)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")

[Out] 1/1056964608*(4*(8*(4*(16*(4*(8*(28*(160*(36*x + 7)*x + 24067)*x + 402861)*x + 9202859)*x + 27904037)*x + 608377125)*x + 13435209)*x + 9883312413)*x + 14824182519)*sqrt(2*x^2 - x + 3) - 94111745/67108864*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.75 \quad \int (3 - x + 2x^2)^{5/2} (2 + 3x + 5x^2) dx$$

Optimal. Leaf size=128

$$\begin{aligned} & \frac{5}{16}x(2x^2 - x + 3)^{7/2} + \frac{141}{448}(2x^2 - x + 3)^{7/2} - \frac{277(1 - 4x)(2x^2 - x + 3)^{5/2}}{3072} \\ & - \frac{31855(1 - 4x)(2x^2 - x + 3)^{3/2}}{98304} - \frac{732665(1 - 4x)\sqrt{2x^2 - x + 3}}{524288} - \frac{16851295 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1048576\sqrt{2}} \end{aligned}$$

[Out] (-732665*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/524288 - (31855*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/98304 - (277*(1 - 4*x)*(3 - x + 2*x^2)^(5/2))/3072 + (141*(3 - x + 2*x^2)^(7/2))/448 + (5*x*(3 - x + 2*x^2)^(7/2))/16 - (16851295*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1048576*Sqrt[2])

Rubi [A] time = 0.123681, antiderivative size = 128, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\begin{aligned} & \frac{5}{16}x(2x^2 - x + 3)^{7/2} + \frac{141}{448}(2x^2 - x + 3)^{7/2} - \frac{277(1 - 4x)(2x^2 - x + 3)^{5/2}}{3072} \\ & - \frac{31855(1 - 4x)(2x^2 - x + 3)^{3/2}}{98304} - \frac{732665(1 - 4x)\sqrt{2x^2 - x + 3}}{524288} - \frac{16851295 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1048576\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2), x]

[Out] (-732665*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/524288 - (31855*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/98304 - (277*(1 - 4*x)*(3 - x + 2*x^2)^(5/2))/3072 + (141*(3 - x + 2*x^2)^(7/2))/448 + (5*x*(3 - x + 2*x^2)^(7/2))/16 - (16851295*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1048576*Sqrt[2])

Rubi in Sympy [A] time = 11.8862, size = 114, normalized size = 0.89

$$\begin{aligned} & -\frac{277(-4x + 1)(2x^2 - x + 3)^{5/2}}{3072} - \frac{31855(-4x + 1)(2x^2 - x + 3)^{3/2}}{98304} \\ & - \frac{732665(-4x + 1)\sqrt{2x^2 - x + 3}}{524288} + \frac{(70x + \frac{141}{2})(2x^2 - x + 3)^{7/2}}{224} + \frac{16851295\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{2097152} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2),x)`

[Out] $-277*(-4*x + 1)*(2*x**2 - x + 3)**(5/2)/3072 - 31855*(-4*x + 1)*(2*x**2 - x + 3)**(3/2)/98304 - 732665*(-4*x + 1)*\sqrt{2*x**2 - x + 3}/524288 + (70*x + 141/2)*(2*x**2 - x + 3)**(7/2)/224 + 16851295*\sqrt{2}*\operatorname{atanh}(\sqrt{2}*(4*x - 1)/(4*\sqrt{2*x**2 - x + 3}))/2097152$

Mathematica [A] time = 0.0868747, size = 75, normalized size = 0.59

$4\sqrt{2x^2 - x + 3} (27525120x^7 - 13565952x^6 + 118808576x^5 - 1619968x^4 + 172684416x^3 + 67272352x^2 + 148957444x + 5853440192)$

Antiderivative was successfully verified.

[In] `Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2),x]`

[Out] $(4*\sqrt{3 - x + 2*x^2}*(58536675 + 148957444*x + 67272352*x^2 + 172684416*x^3 - 1619968*x^4 + 118808576*x^5 - 13565952*x^6 + 27525120*x^7) + 353877195*\sqrt{2}*\operatorname{ArcSinh}[(-1 + 4*x)/\sqrt{23}])/44040192$

Maple [A] time = 0.008, size = 102, normalized size = 0.8

$$\begin{aligned} & \frac{1108x - 277}{3072} (2x^2 - x + 3)^{\frac{5}{2}} + \frac{127420x - 31855}{98304} (2x^2 - x + 3)^{\frac{3}{2}} \\ & + \frac{2930660x - 732665}{524288} \sqrt{2x^2 - x + 3} + \frac{16851295\sqrt{2}}{2097152} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) \\ & + \frac{141}{448} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{5x}{16} (2x^2 - x + 3)^{\frac{7}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2),x)`

[Out] $277/3072*(4*x-1)*(2*x^2-x+3)^(5/2)+31855/98304*(4*x-1)*(2*x^2-x+3)^(3/2)+732665/524288*(4*x-1)*(2*x^2-x+3)^(1/2)+16851295/2097152*2^(1/2)*\operatorname{arcsinh}(4/23*23^(1/2)*(x-1/4))+141/448*(2*x^2-x+3)^(7/2)+5/16*x*(2*x^2-x+3)^(7/2)$

Maxima [A] time = 0.793881, size = 180, normalized size = 1.41

$$\begin{aligned} & \frac{5}{16} (2x^2 - x + 3)^{\frac{7}{2}} x + \frac{141}{448} (2x^2 - x + 3)^{\frac{7}{2}} + \frac{277}{768} (2x^2 - x + 3)^{\frac{5}{2}} x - \frac{277}{3072} (2x^2 - x + 3)^{\frac{5}{2}} \\ & + \frac{31855}{24576} (2x^2 - x + 3)^{\frac{3}{2}} x - \frac{31855}{98304} (2x^2 - x + 3)^{\frac{3}{2}} + \frac{732665}{131072} \sqrt{2x^2 - x + 3} \\ & + \frac{16851295}{2097152} \sqrt{2} \operatorname{arsinh} \left(\frac{1}{23} \sqrt{23} (4x - 1) \right) - \frac{732665}{524288} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")

[Out] 5/16*(2*x^2 - x + 3)^(7/2)*x + 141/448*(2*x^2 - x + 3)^(7/2) + 277/768*(2*x^2 - x + 3)^(5/2)*x - 277/3072*(2*x^2 - x + 3)^(5/2) + 31855/24576*(2*x^2 - x + 3)^(3/2)*x - 31855/98304*(2*x^2 - x + 3)^(3/2) + 732665/131072*sqrt(2*x^2 - x + 3)*x + 16851295/2097152*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 732665/524288*sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.282765, size = 130, normalized size = 1.02

$$\frac{1}{88080384} \sqrt{2} \left(4 \sqrt{2} (27525120 x^7 - 13565952 x^6 + 118808576 x^5 - 1619968 x^4 + 172684416 x^3 + 67272352 x^2 + 148957444 x + 58536675) \sqrt{2x^2 - x + 3} + 353877195 \log(-\sqrt{2} (32x^2 - 16x + 25) - 8\sqrt{2x^2 - x + 3} (4x - 1)) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")

[Out] 1/88080384*sqrt(2)*(4*sqrt(2)*(27525120*x^7 - 13565952*x^6 + 118808576*x^5 - 1619968*x^4 + 172684416*x^3 + 67272352*x^2 + 148957444*x + 58536675)*sqrt(2*x^2 - x + 3) + 353877195*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))

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

$$\int (2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2),x)

[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2), x)

GIAC/XCAS [A] time = 0.272936, size = 112, normalized size = 0.88

$$\frac{1}{11010048} (4 (8 (4 (16 (4 (24 (140 x - 69) x + 14503) x - 791) x + 1349097) x + 2102261) x + 37239361) x + 58536675) \sqrt{2 x^2 - x + 3} - \frac{16851295}{2097152} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2} x - \sqrt{2 x^2 - x + 3} \right) + 1 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")

[Out] 1/11010048*(4*(8*(4*(16*(4*(24*(140*x - 69)*x + 14503)*x - 791)*x + 1349097)*x + 2102261)*x + 37239361)*x + 58536675)*sqrt(2*x^2 - x + 3) - 16851295/2097152*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.76 \quad \int \frac{(3-x+2x^2)^{5/2}}{2+3x+5x^2} dx$$

Optimal. Leaf size=222

$$\begin{aligned} & -\frac{1}{600}(103-60x)(2x^2-x+3)^{3/2} - \frac{(226249-99620x)\sqrt{2x^2-x+3}}{80000} \\ & - \frac{121\sqrt{\frac{11}{31}(25000\sqrt{2}-15457)} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(25000\sqrt{2}-15457)}}(-(690+247\sqrt{2})x-443\sqrt{2}+196)}}{\sqrt{2x^2-x+3}}\right)}{3125} \\ & + \frac{121\sqrt{\frac{11}{31}(15457+25000\sqrt{2})} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(15457+25000\sqrt{2})}}(-(690-247\sqrt{2})x+443\sqrt{2}+196)}}{\sqrt{2x^2-x+3}}\right)}{3125} \\ & - \frac{7216203 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{800000\sqrt{2}} \end{aligned}$$

[Out] -((226249 - 99620*x)*Sqrt[3 - x + 2*x^2])/80000 - ((103 - 60*x)*(3 - x + 2*x^2)^(3/2))/600 - (7216203*ArcSinh[(1 - 4*x)/Sqrt[23]])/(800000*Sqrt[2]) - (121*Sqrt[(11*(-15457 + 25000*Sqrt[2]))]/31)*ArcTan[(Sqrt[11/(62*(-15457 + 25000*Sqrt[2]))])*(196 - 443*Sqrt[2] - (690 + 247*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]]/3125 + (121*Sqrt[(11*(15457 + 25000*Sqrt[2]))]/31)*ArcTanh[(Sqrt[11/(62*(15457 + 25000*Sqrt[2]))])*(196 + 443*Sqrt[2] - (690 - 247*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]]/3125

Rubi [A] time = 1.11301, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\begin{aligned} & -\frac{1}{600}(103-60x)(2x^2-x+3)^{3/2} - \frac{(226249-99620x)\sqrt{2x^2-x+3}}{80000} \\ & - \frac{121\sqrt{\frac{11}{31}(25000\sqrt{2}-15457)} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(25000\sqrt{2}-15457)}}(-(690+247\sqrt{2})x-443\sqrt{2}+196)}}{\sqrt{2x^2-x+3}}\right)}{3125} \\ & + \frac{121\sqrt{\frac{11}{31}(15457+25000\sqrt{2})} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(15457+25000\sqrt{2})}}(-(690-247\sqrt{2})x+443\sqrt{2}+196)}}{\sqrt{2x^2-x+3}}\right)}{3125} \\ & - \frac{7216203 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{800000\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2), x]

[Out] -((226249 - 99620*x)*Sqrt[3 - x + 2*x^2])/80000 - ((103 - 60*x)*(3 - x + 2*x^2)^(3/2))/600 - (7216203*ArcSinh[(1 - 4*x)/Sqrt[23]])/(800000*Sqrt[2]) - (121*Sqrt[(11*(-15457 + 25000*Sqrt[2]))]/31)*ArcTan[(Sqrt[11/(62*(-15457 + 25000*Sqrt[2]))])*(196 - 443*Sqrt[2] - (690 + 247*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/3125 + (121*Sqrt[(11*(15457 + 25000*Sqrt[2]))]/31)*ArcTanh[(Sqrt[11/(62*(15457 + 25000*Sqrt[2]))])*(196 + 443*Sqrt[2] - (690 - 247*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/3125

Rubi in Sympy [A] time = 129.99, size = 250, normalized size = 1.13

$$\frac{\left(-\frac{74715x}{2} + \frac{678747}{8}\right) \sqrt{2x^2 - x + 3}}{30000} - \frac{\left(-30x + \frac{103}{2}\right) (2x^2 - x + 3)^{\frac{3}{2}}}{300}$$

$$+ \frac{\sqrt{341} \left(-311326224\sqrt{2} + 137742528\right) \left(-15460896\sqrt{2} + 151797888\right) \operatorname{atan}\left(\frac{\sqrt{682} \left(x \left(-484909920 - 173583696\sqrt{2}\right) - 311326224\sqrt{2} + 137742528\right)}{43571616\sqrt{-15457 + 25000\sqrt{2}}\sqrt{2x^2 - x + 3}}\right)}{1581649660800000\sqrt{-15457 + 25000\sqrt{2}}}$$

$$+ \frac{7216203\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{1600000}$$

$$+ \frac{\sqrt{341} \left(137742528 + 311326224\sqrt{2}\right) \left(15460896\sqrt{2} + 151797888\right) \operatorname{atanh}\left(\frac{\sqrt{682} \left(x \left(-484909920 + 173583696\sqrt{2}\right) + 137742528 + 311326224\sqrt{2}\right)}{43571616\sqrt{15457 + 25000\sqrt{2}}\sqrt{2x^2 - x + 3}}\right)}{1581649660800000\sqrt{15457 + 25000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2), x)

[Out] -(-74715*x/2 + 678747/8)*sqrt(2*x**2 - x + 3)/30000 - (-30*x + 103/2)*(2*x**2 - x + 3)**(3/2)/300 + sqrt(341)*(-311326224*sqrt(2) + 137742528)*(-15460896*sqrt(2) + 151797888)*atan(sqrt(682)*(x*(-484909920 - 173583696*sqrt(2)) - 311326224*sqrt(2) + 137742528)/(43571616*sqrt(-15457 + 25000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(1581649660800000*sqrt(-15457 + 25000*sqrt(2))) + 7216203*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/1600000 + sqrt(341)*(137742528 + 311326224*sqrt(2))*(15460896*sqrt(2) + 151797888)*atanh(sqrt(682)*(x*(-484909920 + 173583696*sqrt(2)) + 137742528 + 311326224*sqrt(2))/(43571616*sqrt(15457 + 25000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(1581649660800000*sqrt(15457 + 25000*sqrt(2)))


```

- (137500000*I)*Sqrt[22*(-13 + I*Sqrt[31])]x^3*Sqrt[3 - x + 2*x^
2)]/(4168906492*I + 186603384*Sqrt[31] + (4941322076*I)*x + 67309
0352*Sqrt[31]*x + (14142713923*I)*x^2 + 603640246*Sqrt[31]*x^2 -
(1371093740*I)*x^3 + 248749270*Sqrt[31]*x^3 + (8825296925*I)*x^4
+ 482890100*Sqrt[31]*x^4)]/(3125*Sqrt[(62*(-13 + I*Sqrt[31]))/11
]) - (((121*I)/3125)*(-247*I + 119*Sqrt[31])*ArcTan[(31*(26809468
*I + 6019464*Sqrt[31] - (39236196*I)*x + 21712592*Sqrt[31]*x - (1
96135933*I)*x^2 + 19472266*Sqrt[31]*x^2 - (200932460*I)*x^3 + 802
4170*Sqrt[31]*x^3 - (185896675*I)*x^4 + 15577100*Sqrt[31]*x^4)]/(
-910772808 - (46000516*I)*Sqrt[31] - 727715824*x + (277778652*I)*
Sqrt[31]*x + 1240038998*x^2 - (326488029*I)*Sqrt[31]*x^2 - 118868
8490*x^3 - (285779980*I)*Sqrt[31]*x^3 + 1002301300*x^4 - (2146342
75*I)*Sqrt[31]*x^4 - (2500000*I)*Sqrt[682*(13 + I*Sqrt[31])]Sqrt
[3 - x + 2*x^2] + (6250000*I)*Sqrt[682*(13 + I*Sqrt[31])]x*Sqrt[
3 - x + 2*x^2] + (8750000*I)*Sqrt[682*(13 + I*Sqrt[31])]x^2*Sqrt
[3 - x + 2*x^2] + (25000000*I)*Sqrt[682*(13 + I*Sqrt[31])]x^3*Sq
rt[3 - x + 2*x^2]))/Sqrt[(62*(13 + I*Sqrt[31]))/11] - (121*(-247
*I + 119*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt
[31] + (10*I)*x)^2)]/(6250*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + (((
121*I)/6250)*(247*I + 119*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)
*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2)]/Sqrt[(62*(-13 + I*Sqrt[31))
]/11] - (((121*I)/6250)*(247*I + 119*Sqrt[31])*Log[(2 + 3*x + 5*x
^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x
^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]Sqrt[3 - x
+ 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]x*Sqrt[3 - x + 2*x^
2]))/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + (121*(-247*I + 119*Sqrt[
31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x -
22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(1
3 + I*Sqrt[31])]Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqr
t[31])]x*Sqrt[3 - x + 2*x^2]))/(6250*Sqrt[(62*(13 + I*Sqrt[31))
]/11])

```

Maple [B] time = 0.064, size = 4860, normalized size = 21.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(5/2)/(5*x^2+3*x+2), x)

[Out] $\frac{7216203}{1600000} 2^{1/2} \operatorname{arcsinh}\left(\frac{4}{23} 23^{1/2} (x-1/4)\right) - \frac{267449}{800} 00 (2x^2-x+3)^{1/2} + \frac{20603}{12000} x (2x^2-x+3)^{1/2} - \frac{133}{300} x^2 (2x^2-x+3)^{1/2} + \frac{1}{5} x^3 (2x^2-x+3)^{1/2} + \frac{4}{33034375} (8 (2^{1/2} - 1+x)^2 / (2^{1/2} + 1-x)^2 + 3 \cdot 2^{1/2} (2^{1/2} - 1+x)^2 / (2^{1/2} + 1-x)^2 + 8 - 3 \cdot 2^{1/2})^{1/2} \cdot 2^{1/2} (75195 \cdot 2^{1/2} \arctan(1/11692487 (-775687 + 549362 \cdot 2^{1/2})^{1/2} (-23(8+3 \cdot 2^{1/2})) (-23(2^{1/2} - 1+x)^2 / (2^{1/2} + 1-x)^2 + 24 \cdot 2^{1/2} - 41))^{1/2} (6485 \cdot 2^{1/2} (2^{1/2} - 1+x)^2 / (2^{1/2} + 1-x)^2 + 10368 (2^{1/2} - 1+x)^2 / (2^{1/2} + 1-x)^2 + 22379 \cdot 2^{1/2} + 32016) / (23 (2^{1/2} - 1+x)^4 / (2^{1/2} + 1-x)^4 + 82 (2^{1/2} - 1$

$$\begin{aligned}
& +x)^2/(2^{1/2}+1-x)^2+23)^*(8+3*2^{1/2})*(2^{1/2}-1+x)/(2^{1/2}+1-x) \\
& * (-8866+6820*2^{1/2})^{1/2}*(-775687+549362*2^{1/2})^{1/2}+106 \\
& 294*\arctan(1/11692487*(-775687+549362*2^{1/2})^{1/2}*(-23*(8+3*2^{1/2} \\
& (1/2))^*(-23*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+24*2^{1/2}-41))^{1/2} \\
& *(6485*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+10368*(2^{1/2}-1+x \\
&)^2/(2^{1/2}+1-x)^2+22379*2^{1/2}+32016)/(23*(2^{1/2}-1+x)^4/(2^{1/2} \\
& (1/2)+1-x)^4+82*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+23)^*(8+3*2^{1/2})* \\
& (2^{1/2}-1+x)/(2^{1/2}+1-x)*(-8866+6820*2^{1/2})^{1/2}*(-775687+ \\
& 549362*2^{1/2})^{1/2}+108099046*\operatorname{arctanh}(31/2*(8*(2^{1/2}-1+x)^2/(\\
& 2^{1/2}+1-x)^2+3*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+8-3*2^{1/2} \\
& (1/2))^{1/2}/(-8866+6820*2^{1/2})^{1/2})^{1/2}*2^{1/2}-158290154*\operatorname{arctanh}(\\
& 31/2*(8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+3*2^{1/2}*(2^{1/2}-1+x)^2 \\
& /(2^{1/2}+1-x)^2+8-3*2^{1/2})^{1/2}/(-8866+6820*2^{1/2})^{1/2}))/ \\
& ((8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+3*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2} \\
& (1/2)+1-x)^2+8-3*2^{1/2}))/((1+(2^{1/2}-1+x)/(2^{1/2}+1-x))^2)^{1/2} \\
&)/(1+(2^{1/2}-1+x)/(2^{1/2}+1-x))/(8+3*2^{1/2}))/(-8866+6820*2^{1/2} \\
& (1/2))^{1/2}+6/6606875*(8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+3*2^{1/2})* \\
& (2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+8-3*2^{1/2})^{1/2}*2^{1/2}*(10915 \\
& *2^{1/2}*\arctan(1/11692487*(-775687+549362*2^{1/2})^{1/2}*(-23*(8 \\
& +3*2^{1/2}))^*(-23*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+24*2^{1/2}-41))^{1/2} \\
& (1/2)*(6485*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+10368*(2^{1/2} \\
&)-1+x)^2/(2^{1/2}+1-x)^2+22379*2^{1/2}+32016)/(23*(2^{1/2}-1+x)^4 \\
& /(2^{1/2}+1-x)^4+82*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+23)^*(8+3*2^{1/2} \\
& (1/2))^*(2^{1/2}-1+x)/(2^{1/2}+1-x)*(-8866+6820*2^{1/2})^{1/2}*(-77 \\
& 5687+549362*2^{1/2})^{1/2}+14918*\arctan(1/11692487*(-775687+54936 \\
& 2*2^{1/2})^{1/2}*(-23*(8+3*2^{1/2}))^*(-23*(2^{1/2}-1+x)^2/(2^{1/2} \\
& +1-x)^2+24*2^{1/2}-41))^{1/2}*(6485*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2} \\
& (1/2)+1-x)^2+10368*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+22379*2^{1/2}+32 \\
& 016)/(23*(2^{1/2}-1+x)^4/(2^{1/2}+1-x)^4+82*(2^{1/2}-1+x)^2/(2^{1/2} \\
& (1/2)+1-x)^2+23)^*(8+3*2^{1/2})*(2^{1/2}-1+x)/(2^{1/2}+1-x)*(-8866+ \\
& 6820*2^{1/2})^{1/2}*(-775687+549362*2^{1/2})^{1/2}-5052938*\operatorname{arctan} \\
& h(31/2*(8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+3*2^{1/2}*(2^{1/2}-1+x) \\
&)^2/(2^{1/2}+1-x)^2+8-3*2^{1/2})^{1/2}/(-8866+6820*2^{1/2})^{1/2} \\
&)^{1/2}*2^{1/2}-51565338*\operatorname{arctanh}(31/2*(8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2 \\
& +3*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+8-3*2^{1/2})^{1/2}/(-8 \\
& 866+6820*2^{1/2})^{1/2}))/((8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+3*2 \\
& ^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+8-3*2^{1/2}))/((1+(2^{1/2}-1 \\
& +x)/(2^{1/2}+1-x))^2)^{1/2}/((1+(2^{1/2}-1+x)/(2^{1/2}+1-x))/(8+3* \\
& 2^{1/2}))/(-8866+6820*2^{1/2})^{1/2}-21/1321375*(8*(2^{1/2}-1+x)^2 \\
& /(2^{1/2}+1-x)^2+3*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+8-3*2^{1/2} \\
& (1/2))^{1/2}*2^{1/2}*(4245*2^{1/2}*\arctan(1/11692487*(-775687+549 \\
& 362*2^{1/2})^{1/2}*(-23*(8+3*2^{1/2}))^*(-23*(2^{1/2}-1+x)^2/(2^{1/2} \\
& (1/2)+1-x)^2+24*2^{1/2}-41))^{1/2}*(6485*2^{1/2}*(2^{1/2}-1+x)^2/(2^{1/2} \\
& (1/2)+1-x)^2+10368*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+22379*2^{1/2}+ \\
& 32016)/(23*(2^{1/2}-1+x)^4/(2^{1/2}+1-x)^4+82*(2^{1/2}-1+x)^2/(2^{1/2} \\
& (1/2)+1-x)^2+23)^*(8+3*2^{1/2})*(2^{1/2}-1+x)/(2^{1/2}+1-x)*(-886 \\
& 6+6820*2^{1/2})^{1/2}*(-775687+549362*2^{1/2})^{1/2}+6154*\arctan(\\
& 1/11692487*(-775687+549362*2^{1/2})^{1/2}*(-23*(8+3*2^{1/2}))^*(-23 \\
& *(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+24*2^{1/2}-41))^{1/2}*(6485*2^{1/2} \\
& (1/2)*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+10368*(2^{1/2}-1+x)^2/(2^{1/2} \\
&)+1-x)^2+22379*2^{1/2}+32016)/(23*(2^{1/2}-1+x)^4/(2^{1/2}+1-x)^4 \\
& +82*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)^2+23)^*(8+3*2^{1/2})*(2^{1/2}-1+ \\
& x)/(2^{1/2}+1-x)*(-8866+6820*2^{1/2})^{1/2}*(-775687+549362*2^{1/2} \\
& (1/2))^{1/2}+12325786*\operatorname{arctanh}(31/2*(8*(2^{1/2}-1+x)^2/(2^{1/2}+1-x)
\end{aligned}$$


```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2), x)
```

Fricas [A] time = 0.417159, size = 1519, normalized size = 6.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] 1/115320000000*sqrt(155)*sqrt(31)*sqrt(5)*(21648609*sqrt(155)*sqrt(31)*sqrt(5)*(25000*sqrt(2) + 15457)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849))*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)) + 20*sqrt(155)*sqrt(31)*sqrt(5)*(2400000000*x^3 - 5320000000*x^2 + 15457*sqrt(2)*(48000*x^3 - 106400*x^2 + 412060*x - 802347) + 20603000000*x - 40117350000)*sqrt(2*x^2 - x + 3)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 232320*242^(1/4)*sqrt(31)*(15457*sqrt(2) + 50000)*log(468512/5*(2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(25340070869392033*x - 63023045494527892) + 37682974625135859*x - 88363116363919925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 24092767700750000*x^2 + 220*sqrt(2)*(196675654700000*x^2 + 61656718648993*sqrt(2)*(2*x^2 - x + 3) - 98337827350000*x + 295013482050000) + 308283593244965*sqrt(2)*(49*x^2 - 151*x + 200) - 74245059649250000*x + 9833782735000000)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2)) + 232320*242^(1/4)*sqrt(31)*(15457*sqrt(2) + 50000)*log(-468512/5*(2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(25340070869392033*x - 63023045494527892) + 37682974625135859*x - 88363116363919925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 24092767700750000*x^2 - 220*sqrt(2)*(196675654700000*x^2 + 61656718648993*sqrt(2)*(2*x^2 - x + 3) - 98337827350000*x + 295013482050000) - 308283593244965*sqrt(2)*(49*x^2 - 151*x + 200) + 74245059649250000*x - 98337827350000000)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2)) + 164520660480*242^(1/4)*sqrt(2)*arctan(31*(sqrt(155)*sqrt(5)*(25000*sqrt(2)*(x - 6) + 15457*x - 92742)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 10*242^(1/4)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(2*sqrt(155)*sqrt(31)*sqrt(5)*sqrt(2/5)*(25000*sqrt(2)*x + 15457*x)*sqrt((2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(25340070869392033*x - 63023045494527892) + 37682974625135859*x - 88363116363919925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 24092767700750000*x^2 + 220*sqrt(2)*(196675654700000*x^2 + 61656718648993*sqrt(2)*(2*x^2 - x + 3) - 98337827350000*x + 295013482050000) + 308283593244965*sqrt(2)*(49*x^2 - 151*x + 200) - 74245059649250000*x + 98337827350000000)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2))*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849))
```

```

00*sqrt(2) + 1488918849)) + sqrt(155)*sqrt(31)*sqrt(5)*(25000*sqrt(2)*(19*x - 22) + 293683*x - 340054)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 310*242^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(54*sqrt(2) + 11))) + 164520660480*242^(1/4)*sqrt(2)*arctan(-31*(sqrt(155)*sqrt(5)*(25000*sqrt(2)*(x - 6) + 15457*x - 92742)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 10*242^(1/4)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(2*sqrt(155)*sqrt(31)*sqrt(5)*sqrt(2/5)*(25000*sqrt(2)*x + 15457*x)*sqrt(-(2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(25340070869392033*x - 63023045494527892) + 37682974625135859*x - 88363116363919925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 24092767700750000*x^2 - 220*sqrt(2)*(196675654700000*x^2 + 61656718648993*sqrt(2)*(2*x^2 - x + 3) - 98337827350000*x + 295013482050000) - 308283593244965*sqrt(2)*(49*x^2 - 151*x + 200) + 74245059649250000*x - 98337827350000000)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2))*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + sqrt(155)*sqrt(31)*sqrt(5)*(25000*sqrt(2)*(19*x - 22) + 293683*x - 340054)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 310*242^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(54*sqrt(2) + 11)))/((15457*sqrt(2) + 50000)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)))

```

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

$$\int \frac{(2x^2 - x + 3)^{\frac{5}{2}}}{5x^2 + 3x + 2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)/(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.77 \quad \int \frac{(3-x+2x^2)^{5/2}}{(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=255

$$\begin{aligned} & \frac{(10x+3)(2x^2-x+3)^{5/2}}{31(5x^2+3x+2)} + \frac{4}{155}(4-5x)(2x^2-x+3)^{3/2} - \frac{(2240x+1277)\sqrt{2x^2-x+3}}{7750} \\ & + \frac{11\sqrt{\frac{11}{31}(224510383+194487500\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(224510383+194487500\sqrt{2})}}((87710+54423\sqrt{2})x+33287\sqrt{2}+21136)}}{\sqrt{2x^2-x+3}}\right)}{38750} \\ & - \frac{11\sqrt{\frac{11}{31}(194487500\sqrt{2}-224510383)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(194487500\sqrt{2}-224510383)}}((87710-54423\sqrt{2})x-33287\sqrt{2}+21136)}}{\sqrt{2x^2-x+3}}\right)}{38750} \\ & - \frac{4799 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2500\sqrt{2}} \end{aligned}$$

[Out] -((1277 + 2240*x)*Sqrt[3 - x + 2*x^2])/7750 + (4*(4 - 5*x)*(3 - x + 2*x^2)^(3/2))/155 + ((3 + 10*x)*(3 - x + 2*x^2)^(5/2))/(31*(2 + 3*x + 5*x^2)) - (4799*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2500*Sqrt[2]) + (11*Sqrt[(11*(224510383 + 194487500*Sqrt[2]))/31]*ArcTan[(Sqrt[11/(62*(224510383 + 194487500*Sqrt[2]))])*(21136 + 33287*Sqrt[2]) + (87710 + 54423*Sqrt[2])*x])/Sqrt[3 - x + 2*x^2])/38750 - (11*Sqrt[(11*(-224510383 + 194487500*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-224510383 + 194487500*Sqrt[2]))])*(21136 - 33287*Sqrt[2]) + (87710 - 54423*Sqrt[2])*x])/Sqrt[3 - x + 2*x^2])/38750

Rubi [A] time = 1.38489, antiderivative size = 255, normalized size of antiderivative = 1., number of rules used = 11, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\begin{aligned} & \frac{(10x+3)(2x^2-x+3)^{5/2}}{31(5x^2+3x+2)} + \frac{4}{155}(4-5x)(2x^2-x+3)^{3/2} - \frac{(2240x+1277)\sqrt{2x^2-x+3}}{7750} \\ & + \frac{11\sqrt{\frac{11}{31}(224510383+194487500\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{62(224510383+194487500\sqrt{2})}}((87710+54423\sqrt{2})x+33287\sqrt{2}+21136)}}{\sqrt{2x^2-x+3}}\right)}{38750} \\ & - \frac{11\sqrt{\frac{11}{31}(194487500\sqrt{2}-224510383)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{62(194487500\sqrt{2}-224510383)}}((87710-54423\sqrt{2})x-33287\sqrt{2}+21136)}}{\sqrt{2x^2-x+3}}\right)}{38750} \\ & - \frac{4799 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2500\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^2, x]

[Out] -((1277 + 2240*x)*Sqrt[3 - x + 2*x^2])/7750 + (4*(4 - 5*x)*(3 - x + 2*x^2)^(3/2))/155 + ((3 + 10*x)*(3 - x + 2*x^2)^(5/2))/(31*(2 + 3*x + 5*x^2)) - (4799*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2500*Sqrt[2]) + (11*Sqrt[(11*(224510383 + 194487500*Sqrt[2]))/31]*ArcTan[(Sqrt[11/(62*(224510383 + 194487500*Sqrt[2])))]*(21136 + 33287*Sqrt[2]) + (87710 + 54423*Sqrt[2])*x])/Sqrt[3 - x + 2*x^2])/38750 - (11*Sqrt[(11*(-224510383 + 194487500*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-224510383 + 194487500*Sqrt[2])))]*(21136 - 33287*Sqrt[2]) + (87710 - 54423*Sqrt[2])*x])/Sqrt[3 - x + 2*x^2])/38750

Rubi in Sympy [A] time = 152.489, size = 270, normalized size = 1.06

$$\frac{(-2400x + 1920)(2x^2 - x + 3)^{\frac{3}{2}}}{18600} + \frac{(10x + 3)(2x^2 - x + 3)^{\frac{5}{2}}}{31(5x^2 + 3x + 2)} - \frac{(537600x + 306480)\sqrt{2x^2 - x + 3}}{1860000}$$

$$+ \frac{\sqrt{341} \left(6751683840 + 10633199280\sqrt{2} \right) \left(2428382880\sqrt{2} + 5923695360 \right) \operatorname{atan} \left(\frac{\sqrt{682} \left(x \left(17384883120\sqrt{2} + 28018082400 \right) + 6751683840 + 10633199280\sqrt{2} \right)}{19805280\sqrt{224510383 + 194487500\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{4457376316800000\sqrt{224510383 + 194487500\sqrt{2}}}$$

$$+ \frac{4799\sqrt{2} \operatorname{atanh} \left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}} \right)}{5000}$$

$$+ \frac{\sqrt{341} \left(-10633199280\sqrt{2} + 6751683840 \right) \left(-2428382880\sqrt{2} + 5923695360 \right) \operatorname{atanh} \left(\frac{\sqrt{682} \left(x \left(-17384883120\sqrt{2} + 28018082400 \right) - 10633199280\sqrt{2} \right)}{19805280\sqrt{-224510383 + 194487500\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{4457376316800000\sqrt{-224510383 + 194487500\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2, x)

[Out] (-2400*x + 1920)*(2*x**2 - x + 3)**(3/2)/18600 + (10*x + 3)*(2*x**2 - x + 3)**(5/2)/(31*(5*x**2 + 3*x + 2)) - (537600*x + 306480)*sqrt(2*x**2 - x + 3)/1860000 + sqrt(341)*(6751683840 + 10633199280*sqrt(2))*(2428382880*sqrt(2) + 5923695360)*atan(sqrt(682)*(x*(17384883120*sqrt(2) + 28018082400) + 6751683840 + 10633199280*sqrt(2))/(19805280*sqrt(224510383 + 194487500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(4457376316800000*sqrt(224510383 + 194487500*sqrt(2))) + 4799*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/5000 + sqrt(341)*(-10633199280*sqrt(2) + 6751683840)*(-2428382880*sqrt(2) + 5923695360)*atanh(sqrt(682)*(x*(-17384883120*sqrt(2) + 28018082400) - 10633199280*sqrt(2) + 6751683840)/(19805280*sqrt(-224510383 + 194487500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(4457376316800000*sqrt(-224510383 + 194487500*sqrt(2)))

Mathematica [C] time = 6.48089, size = 1196, normalized size = 4.69

result too large to display

Antiderivative was successfully verified.

[In] Integrate[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^2,x]

[Out] Sqrt[3 - x + 2*x^2]*(-93/250 + (2*x)/25 + (121*(61 + 69*x))/(3875*(2 + 3*x + 5*x^2))) + (4799*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(2500*Sqrt[2]) + (11*(54423*I + 5471*Sqrt[31])*ArcTan[(229424911848 + (598135009404*I)*Sqrt[31] - 19618154755056*x - (442968415588*I)*Sqrt[31]*x - 8562978915238*x^2 - (6467393362549*I)*Sqrt[31]*x^2 - 7951179150310*x^3 - (3217382742380*I)*Sqrt[31]*x^3 - 10153214745300*x^4 - (5398817571275*I)*Sqrt[31]*x^4 + (1225271250000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (1410034375000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (2421369375000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - (1069681250000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(33567280351452*I + 2566573445304*Sqrt[31] + (46558455544956*I)*x + 3109048142112*Sqrt[31]*x + (67464554574163*I)*x^2 + 1920538422726*Sqrt[31]*x^2 - (36372791374940*I)*x^3 + 2132710526870*Sqrt[31]*x^3 + (35258085140925*I)*x^4 + 1020675778100*Sqrt[31]*x^4)]/(38750*Sqrt[(62*(-13 + I*Sqrt[31]))/11]) - (((11*I)/38750)*(-54423*I + 5471*Sqrt[31])*ArcTan[(31*(171942569308*I + 82792691784*Sqrt[31] - (567090904676*I)*x + 100291875552*Sqrt[31]*x - (152978574973*I)*x^2 + 61952852346*Sqrt[31]*x^2 - (733916407260*I)*x^3 + 68797113770*Sqrt[31]*x^3 - (368818270675*I)*x^4 + 32925025100*Sqrt[31]*x^4)]/(-229424911848 + (598135009404*I)*Sqrt[31] + 19618154755056*x - (442968415588*I)*Sqrt[31]*x + 8562978915238*x^2 - (6467393362549*I)*Sqrt[31]*x^2 + 7951179150310*x^3 - (3217382742380*I)*Sqrt[31]*x^3 + 10153214745300*x^4 - (5398817571275*I)*Sqrt[31]*x^4 - (19448750000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (48621875000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (68070625000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (194487500000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2]))/Sqrt[(62*(13 + I*Sqrt[31]))/11] - (11*(-54423*I + 5471*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(77500*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + (((11*I)/77500)*(54423*I + 5471*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] - (((11*I)/77500)*(54423*I + 5471*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]))/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + (11*(-54423*I + 5471*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])]/(77500*Sqrt[(62*(13 + I*Sqr

t[31]))/11))

Maple [B] time = 0.185, size = 40028, normalized size = 157.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^2,x)

[Out] result too large to display

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

$$\int \frac{(2x^2 - x + 3)^{\frac{5}{2}}}{(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")

[Out] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2, x)

Fricas [A] time = 0.383538, size = 1621, normalized size = 6.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")

[Out] -1/115879542250000*sqrt(155590)*sqrt(155)*sqrt(31)*(148769*sqrt(155590)*sqrt(155)*sqrt(31)*(1122551915*x^2 - 194487500*sqrt(2)*(5*x^2 + 3*x + 2) + 673531149*x + 449020766)*sqrt((224510383*sqrt(2) - 388975000)/(87328926227425000*sqrt(2) - 126055687387306689))*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)) - 20*sqrt(155590)*sqrt(155)*sqrt(31)*(120582250000*x^3 - 4883581125000*x^2 - 224510383*sqrt(2)*(3100*x^3 - 12555*x^2 + 9289*x + 8996) + 3613188775000*x + 3499219100000)*sqrt(2*x^2 - x + 3)*sq

$$\begin{aligned}
& \text{rt}((224510383*\text{sqrt}(2) - 388975000)/(87328926227425000*\text{sqrt}(2) - 1 \\
& 26055687387306689)) + 194625006620*234335841608^{(1/4)}*\text{sqrt}(2)*(5* \\
& x^2 + 3*x + 2)*\text{arctan}(31*(\text{sqrt}(155590)*\text{sqrt}(155))*(194487500*\text{sqrt}(\\
& 2)*(x - 6) - 224510383*x + 1347062298)*\text{sqrt}((224510383*\text{sqrt}(2) - \\
& 388975000)/(87328926227425000*\text{sqrt}(2) - 126055687387306689)) + 10 \\
& *234335841608^{(1/4)}*\text{sqrt}(2*x^2 - x + 3)*(10568*\text{sqrt}(2) - 33287))/ \\
& (\text{sqrt}(155590)*\text{sqrt}(155)*\text{sqrt}(31)*(194487500*\text{sqrt}(2)*(19*x - 22) - \\
& 4265697277*x + 4939228426)*\text{sqrt}((224510383*\text{sqrt}(2) - 388975000)/ \\
& (87328926227425000*\text{sqrt}(2) - 126055687387306689)) + 4*\text{sqrt}(155)*\text{s} \\
& \text{qrt}(31)*(194487500*\text{sqrt}(2)*x - 224510383*x)*\text{sqrt}(-(234335841608^{(\\
& 1/4)}*\text{sqrt}(155590)*\text{sqrt}(155)*\text{sqrt}(2*x^2 - x + 3))*(\text{sqrt}(2)*(1636166 \\
& 538266142926655786830673*x + 680003375616613745564101760498) - 23 \\
& 16169913882756672219888591171*x - 956163162649529181091685070175) \\
& *\text{sqrt}((224510383*\text{sqrt}(2) - 388975000)/(87328926227425000*\text{sqrt}(2) \\
& - 126055687387306689)) + 336386016052924364123033140375000*x^2 + \\
& 3422980*\text{sqrt}(2)*(176490024700146966122650000*x^2 - 62269579733965 \\
& 133460851887*\text{sqrt}(2)*(2*x^2 - x + 3) - 88245012350073483061325000 \\
& *x + 264735037050220449183975000) - 48442619554038175575869725491 \\
& 65*\text{sqrt}(2)*(49*x^2 - 151*x + 200) - 10366181311018689588281225346 \\
& 25000*x + 1373004147154793322951155675000000)/(622695797339651334 \\
& 60851887*\text{sqrt}(2)*x^2 - 88245012350073483061325000*x^2))*\text{sqrt}((224 \\
& 510383*\text{sqrt}(2) - 388975000)/(87328926227425000*\text{sqrt}(2) - 12605568 \\
& 7387306689)) - 310*234335841608^{(1/4)}*\text{sqrt}(31)*\text{sqrt}(2*x^2 - x + 3 \\
&)*(4636*\text{sqrt}(2) - 3801))) + 194625006620*234335841608^{(1/4)}*\text{sqrt}(\\
& 2)*(5*x^2 + 3*x + 2)*\text{arctan}(-31*(\text{sqrt}(155590)*\text{sqrt}(155))*(19448750 \\
& 0*\text{sqrt}(2)*(x - 6) - 224510383*x + 1347062298)*\text{sqrt}((224510383*\text{sqr} \\
& \text{t}(2) - 388975000)/(87328926227425000*\text{sqrt}(2) - 126055687387306689 \\
&)) - 10*234335841608^{(1/4)}*\text{sqrt}(2*x^2 - x + 3)*(10568*\text{sqrt}(2) - 3 \\
& 3287))/(\text{sqrt}(155590)*\text{sqrt}(155)*\text{sqrt}(31)*(194487500*\text{sqrt}(2)*(19*x \\
& - 22) - 4265697277*x + 4939228426)*\text{sqrt}((224510383*\text{sqrt}(2) - 3889 \\
& 75000)/(87328926227425000*\text{sqrt}(2) - 126055687387306689)) + 4*\text{sqrt} \\
& (155)*\text{sqrt}(31)*(194487500*\text{sqrt}(2)*x - 224510383*x)*\text{sqrt}((23433584 \\
& 1608^{(1/4)}*\text{sqrt}(155590)*\text{sqrt}(155)*\text{sqrt}(2*x^2 - x + 3))*(\text{sqrt}(2)*(1 \\
& 636166538266142926655786830673*x + 680003375616613745564101760498 \\
&) - 2316169913882756672219888591171*x - 9561631626495291810916850 \\
& 70175)*\text{sqrt}((224510383*\text{sqrt}(2) - 388975000)/(87328926227425000*\text{sq} \\
& \text{rt}(2) - 126055687387306689)) - 336386016052924364123033140375000* \\
& x^2 - 3422980*\text{sqrt}(2)*(176490024700146966122650000*x^2 - 62269579 \\
& 733965133460851887*\text{sqrt}(2)*(2*x^2 - x + 3) - 88245012350073483061 \\
& 325000*x + 264735037050220449183975000) + 48442619554038175575869 \\
& 72549165*\text{sqrt}(2)*(49*x^2 - 151*x + 200) + 10366181311018689588281 \\
& 22534625000*x - 1373004147154793322951155675000000)/(622695797339 \\
& 65133460851887*\text{sqrt}(2)*x^2 - 88245012350073483061325000*x^2))*\text{sqr} \\
& \text{t}((224510383*\text{sqrt}(2) - 388975000)/(87328926227425000*\text{sqrt}(2) - 12 \\
& 6055687387306689)) + 310*234335841608^{(1/4)}*\text{sqrt}(31)*\text{sqrt}(2*x^2 - \\
& x + 3)*(4636*\text{sqrt}(2) - 3801))) - 55*234335841608^{(1/4)}*\text{sqrt}(31)* \\
& (1944875000*x^2 - 224510383*\text{sqrt}(2)*(5*x^2 + 3*x + 2) + 116692500 \\
& 0*x + 777950000)*\text{log}(-75305560*(234335841608^{(1/4)}*\text{sqrt}(155590)*\text{s} \\
& \text{qrt}(155)*\text{sqrt}(2*x^2 - x + 3))*(\text{sqrt}(2)*(16361665382661429266557868 \\
& 30673*x + 680003375616613745564101760498) - 231616991388275667221 \\
& 9888591171*x - 956163162649529181091685070175)*\text{sqrt}((224510383*\text{sq} \\
& \text{rt}(2) - 388975000)/(87328926227425000*\text{sqrt}(2) - 12605568738730668 \\
& 9)) + 336386016052924364123033140375000*x^2 + 3422980*\text{sqrt}(2)*(17 \\
& 6490024700146966122650000*x^2 - 62269579733965133460851887*\text{sqrt}(2)
\end{aligned}$$

$$\begin{aligned} &) * (2 * x^2 - x + 3) - 88245012350073483061325000 * x + 26473503705022 \\ & 0449183975000) - 4844261955403817557586972549165 * \sqrt{2} * (49 * x^2 \\ & - 151 * x + 200) - 1036618131101868958828122534625000 * x + 137300414 \\ & 7154793322951155675000000) / (62269579733965133460851887 * \sqrt{2} * x^2 \\ & - 88245012350073483061325000 * x^2)) + 55 * 234335841608^{(1/4)} * \sqrt{2} \\ & (31) * (1944875000 * x^2 - 224510383 * \sqrt{2} * (5 * x^2 + 3 * x + 2) + 1166 \\ & 925000 * x + 777950000) * \log(75305560 * (234335841608^{(1/4)} * \sqrt{2} * \sqrt{15559} \\ & 0) * \sqrt{155} * \sqrt{2 * x^2 - x + 3}) * (\sqrt{2} * (1636166538266142926655 \\ & 786830673 * x + 680003375616613745564101760498) - 23161699138827566 \\ & 72219888591171 * x - 956163162649529181091685070175) * \sqrt{2} * ((22451038 \\ & 3 * \sqrt{2} - 388975000) / (87328926227425000 * \sqrt{2} - 1260556873873 \\ & 06689)) - 336386016052924364123033140375000 * x^2 - 3422980 * \sqrt{2} \\ & * (176490024700146966122650000 * x^2 - 62269579733965133460851887 * \sqrt{2} \\ & * (2 * x^2 - x + 3) - 88245012350073483061325000 * x + 2647350370 \\ & 50220449183975000) + 4844261955403817557586972549165 * \sqrt{2} * (49 * \\ & x^2 - 151 * x + 200) + 1036618131101868958828122534625000 * x - 13730 \\ & 04147154793322951155675000000) / (62269579733965133460851887 * \sqrt{2} \\ &) * x^2 - 88245012350073483061325000 * x^2)) / ((1944875000 * x^2 - 2245 \\ & 10383 * \sqrt{2} * (5 * x^2 + 3 * x + 2) + 1166925000 * x + 777950000) * \sqrt{2} * \\ & ((224510383 * \sqrt{2} - 388975000) / (87328926227425000 * \sqrt{2} - 1260 \\ & 55687387306689))) \end{aligned}$$

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

$$\int \frac{(2x^2 - x + 3)^{\frac{5}{2}}}{(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2,x)

[Out] Integral((2*x**2 - x + 3)**(5/2)/(5*x**2 + 3*x + 2)**2, x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")

[Out] Exception raised: TypeError

$$3.78 \quad \int \frac{(3-x+2x^2)^{5/2}}{(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=281

$$\begin{aligned} & \frac{(10x+3)(2x^2-x+3)^{5/2}}{62(5x^2+3x+2)^2} + \frac{(2336x+769)(2x^2-x+3)^{3/2}}{3844(5x^2+3x+2)} + \frac{(11359-12920x)\sqrt{2x^2-x+3}}{48050} \\ & + \frac{\sqrt{11(1+4\sqrt{2})} \left(2937349 + 1978861\sqrt{2} \right) \tan^{-1} \left(\frac{\sqrt{\frac{11}{62(3531015707557+2498852071250\sqrt{2})}} \left((9832420+6895071\sqrt{2})x+2937349\sqrt{2}+3957722 \right)}{\sqrt{2x^2-x+3}} \right)}{29791000} \\ & + \frac{\left(2937349 - 1978861\sqrt{2} \right) \sqrt{11(4\sqrt{2}-1)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{62(2498852071250\sqrt{2}-3531015707557)}} \left((9832420-6895071\sqrt{2})x-2937349\sqrt{2}+3957722 \right)}{\sqrt{2x^2-x+3}} \right)}{29791000} \\ & - \frac{4}{125} \sqrt{2} \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right) \end{aligned}$$

[Out] ((11359 - 12920*x)*Sqrt[3 - x + 2*x^2])/48050 + ((3 + 10*x)*(3 - x + 2*x^2)^(5/2))/(62*(2 + 3*x + 5*x^2)^2) + ((769 + 2336*x)*(3 - x + 2*x^2)^(3/2))/(3844*(2 + 3*x + 5*x^2)) - (4*Sqrt[2]*ArcSinh[(1 - 4*x)/Sqrt[23]])/125 + (Sqrt[11*(1 + 4*Sqrt[2])]*(2937349 + 1978861*Sqrt[2])*ArcTan[Sqrt[11/(62*(3531015707557 + 2498852071250*Sqrt[2]))]*(3957722 + 2937349*Sqrt[2]) + (9832420 + 6895071*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/29791000 - ((2937349 - 1978861*Sqrt[2])*Sqrt[11*(-1 + 4*Sqrt[2])]*ArcTanh[Sqrt[11/(62*(-3531015707557 + 2498852071250*Sqrt[2]))]*(3957722 - 2937349*Sqrt[2]) + (9832420 - 6895071*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/29791000

Rubi [A] time = 1.38483, antiderivative size = 281, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.37$

$$\begin{aligned} & \frac{(10x+3)(2x^2-x+3)^{5/2}}{62(5x^2+3x+2)^2} + \frac{(2336x+769)(2x^2-x+3)^{3/2}}{3844(5x^2+3x+2)} + \frac{(11359-12920x)\sqrt{2x^2-x+3}}{48050} \\ & + \frac{\sqrt{11(1+4\sqrt{2})} \left(2937349 + 1978861\sqrt{2} \right) \tan^{-1} \left(\frac{\sqrt{\frac{11}{62(3531015707557+2498852071250\sqrt{2})}} \left((9832420+6895071\sqrt{2})x+2937349\sqrt{2}+3957722 \right)}{\sqrt{2x^2-x+3}} \right)}{29791000} \\ & + \frac{\left(2937349 - 1978861\sqrt{2} \right) \sqrt{11(4\sqrt{2}-1)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{62(2498852071250\sqrt{2}-3531015707557)}} \left((9832420-6895071\sqrt{2})x-2937349\sqrt{2}+3957722 \right)}{\sqrt{2x^2-x+3}} \right)}{29791000} \\ & - \frac{4}{125} \sqrt{2} \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right) \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^3, x]

[Out] ((11359 - 12920*x)*Sqrt[3 - x + 2*x^2])/48050 + ((3 + 10*x)*(3 - x + 2*x^2)^(5/2))/(62*(2 + 3*x + 5*x^2)^2) + ((769 + 2336*x)*(3 - x + 2*x^2)^(3/2))/(3844*(2 + 3*x + 5*x^2)) - (4*Sqrt[2]*ArcSinh[(1 - 4*x)/Sqrt[23]])/125 + (Sqrt[11*(1 + 4*Sqrt[2])])*(2937349 + 1978861*Sqrt[2])*ArcTan[(Sqrt[11/(62*(3531015707557 + 2498852071250*Sqrt[2])])*(3957722 + 2937349*Sqrt[2] + (9832420 + 6895071*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]]/29791000 - ((2937349 - 1978861*Sqrt[2])*Sqrt[11*(-1 + 4*Sqrt[2])])*ArcTanh[(Sqrt[11/(62*(-3531015707557 + 2498852071250*Sqrt[2])])*(3957722 - 2937349*Sqrt[2] + (9832420 - 6895071*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]]/29791000

Rubi in Sympy [A] time = 155.682, size = 284, normalized size = 1.01

$$\begin{aligned} & \frac{(-258400x + 227180)\sqrt{2x^2 - x + 3}}{961000} + \frac{(10x + 3)(2x^2 - x + 3)^{\frac{5}{2}}}{62(5x^2 + 3x + 2)^2} + \frac{(5840x + \frac{3845}{2})(2x^2 - x + 3)^{\frac{3}{2}}}{9610(5x^2 + 3x + 2)} \\ & + \frac{\sqrt{341} \left(2394421810 + 1777096145\sqrt{2} \right) \left(732566670\sqrt{2} + 1071689740 \right) \operatorname{atan} \left(\frac{\sqrt{682} \left(x \left(4171517955\sqrt{2} + 5948614100 \right) + 2394421810 + 1777096145\sqrt{2} \right)}{37510\sqrt{3531015707557 + 2498852071250\sqrt{2}\sqrt{2x^2 - x + 3}}} \right)}{43617003100000\sqrt{3531015707557 + 2498852071250\sqrt{2}}} \\ & + \frac{4\sqrt{2} \operatorname{atanh} \left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}} \right)}{125} \\ & + \frac{\sqrt{341} \left(-1777096145\sqrt{2} + 2394421810 \right) \left(-732566670\sqrt{2} + 1071689740 \right) \operatorname{atanh} \left(\frac{\sqrt{682} \left(x \left(-4171517955\sqrt{2} + 5948614100 \right) - 1777096145\sqrt{2} \right)}{37510\sqrt{-3531015707557 + 2498852071250\sqrt{2}\sqrt{2x^2 - x + 3}}} \right)}{43617003100000\sqrt{-3531015707557 + 2498852071250\sqrt{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3, x)

[Out] (-258400*x + 227180)*sqrt(2*x**2 - x + 3)/961000 + (10*x + 3)*(2*x**2 - x + 3)**(5/2)/(62*(5*x**2 + 3*x + 2)**2) + (5840*x + 3845/2)*(2*x**2 - x + 3)**(3/2)/(9610*(5*x**2 + 3*x + 2)) + sqrt(341)*(2394421810 + 1777096145*sqrt(2))*(732566670*sqrt(2) + 1071689740)*atan(sqrt(682)*(x*(4171517955*sqrt(2) + 5948614100) + 2394421810 + 1777096145*sqrt(2))/(37510*sqrt(3531015707557 + 2498852071250*sqrt(2))*sqrt(2*x**2 - x + 3)))/(43617003100000*sqrt(3531015707557 + 2498852071250*sqrt(2))) + 4*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/125 + sqrt(341)*(-1777096145*sqrt(2) + 2394421810)*(-732566670*sqrt(2) + 1071689740)*atanh(sqrt(682)*(x*(-4171517955*sqrt(2) + 5948614100) - 1777096145*sqrt(2) + 2394421810)/(37510*sqrt(-3531015707557 + 2498852071250*sqrt(2))*sqrt(2*x**2 - x + 3)))/(43617003100000*sqrt(-3531015707557 + 2498852071250*sqrt(2)))

```
**2 - x + 3)))/(43617003100000*sqrt(-3531015707557 + 249885207125
0*sqrt(2)))
```

Mathematica [C] time = 6.50899, size = 1203, normalized size = 4.28

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((121*(61 + 69*x))/(7750*(2 + 3*x + 5*x^2)^2)
+ (11*(35579 + 97155*x))/(480500*(2 + 3*x + 5*x^2))) + (4*Sqrt[2
]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/125 - ((I/961000)*(-6895071*I + 2
80267*Sqrt[31])*ArcTan[(31*(1286646864280132*I + 987421307406336*
Sqrt[31] - (5888947864615004*I)*x + 386335744679808*Sqrt[31]*x +
(5595672650742083*I)*x^2 + 549395637070434*Sqrt[31]*x^2 - (602954
7074679540*I)*x^3 + 433781845112330*Sqrt[31]*x^3 + (1742846817367
925*I)*x^4 + 86404550417900*Sqrt[31]*x^4))/(47470658398910208 + (
9672976872245316*I)*Sqrt[31] + 274205806118598024*x - (2059873282
4854252*I)*Sqrt[31]*x + 33816025817929102*x^2 - (5917231661129952
1*I)*Sqrt[31]*x^2 + 160404448215022990*x^3 - (22636449983151020*I
)*Sqrt[31]*x^3 + 65896915460933700*x^4 - (52587956640176975*I)*Sq
rt[31]*x^4 - (249885207125000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt
[3 - x + 2*x^2] + (624713017812500*I)*Sqrt[682*(13 + I*Sqrt[31])]
*x*Sqrt[3 - x + 2*x^2] + (874598224937500*I)*Sqrt[682*(13 + I*Sqr
t[31])]*x^2*Sqrt[3 - x + 2*x^2] + (2498852071250000*I)*Sqrt[682*(
13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])]/Sqrt[(62*(13 + I*Sqr
t[31]))/11] - ((I/961000)*(6895071*I + 280267*Sqrt[31])*ArcTanh[(
-47470658398910208*I - 9672976872245316*Sqrt[31] - (2742058061185
98024*I)*x + 20598732824854252*Sqrt[31]*x - (33816025817929102*I)
*x^2 + 59172316611299521*Sqrt[31]*x^2 - (160404448215022990*I)*x^
3 + 22636449983151020*Sqrt[31]*x^3 - (65896915460933700*I)*x^4 +
52587956640176975*Sqrt[31]*x^4 - 15742768048875000*Sqrt[22*(-13 +
I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 18116677516562500*Sqrt[22*(-1
3 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 31110708287062500*Sqrt[2
2*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 13743686391875000
*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(4598843614
57315908*I + 30610060529596416*Sqrt[31] + (554886342419315124*I)*
x + 11976408085074048*Sqrt[31]*x + (632413940805120427*I)*x^2 + 1
7031264749183454*Sqrt[31]*x^2 - (572735070344934260*I)*x^3 + 1344
7237198482230*Sqrt[31]*x^3 + (252081127389719325*I)*x^4 + 2678541
062954900*Sqrt[31]*x^4)]/Sqrt[(62*(-13 + I*Sqrt[31]))/11] - ((-6
895071*I + 280267*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3
*I + Sqrt[31] + (10*I)*x)^2])/(1922000*Sqrt[(62*(13 + I*Sqrt[31])
)/11]) + ((I/1922000)*(6895071*I + 280267*Sqrt[31])*Log[(-3*I + S
qrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-
13 + I*Sqrt[31]))/11] - ((I/1922000)*(6895071*I + 280267*Sqrt[31]
)*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sq
rt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sq
```

```
rt[31]])*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]
*x*Sqrt[3 - x + 2*x^2])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + ((-6
895071*I + 280267*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*S
qrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*
x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])] *Sqrt[3 - x + 2*x^2] + (22
*I)*Sqrt[22*(13 + I*Sqrt[31])] *x*Sqrt[3 - x + 2*x^2]])/ (1922000*
Sqrt[(62*(13 + I*Sqrt[31]))/11])
```

Maple [B] time = 0.42, size = 119321, normalized size = 424.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^3,x)
```

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

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

$$\int \frac{(2x^2 - x + 3)^{\frac{5}{2}}}{(5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3, x)
```

Fricas [A] time = 0.479522, size = 1773, normalized size = 6.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] -1/915712169913331312000*sqrt(1999081657)*7688^(3/4)*sqrt(31)*(61
504*sqrt(1999081657)*7688^(1/4)*sqrt(31)*(88275392688925*x^4 + 10
```

$$\begin{aligned}
& 5930471226710*x^3 + 102399455519153*x^2 - 2498852071250*\sqrt{2}*(\\
& 25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 42372188490684*x + 1412406 \\
& 2830228)*\sqrt{((3531015707557*\sqrt{2}) - 4997704142500)/(1764697182 \\
& 8890187454872500*\sqrt{2}) - 24956595274995091500033249)}*\log(-4*\sqrt{ \\
& \sqrt{2}*\sqrt{2*x^2 - x + 3}*(4*x - 1) - 32*x^2 + 16*x - 25) - 220*\sqrt{ \\
& \sqrt{1999081657}*7688^{(1/4)}*\sqrt{31}*(485551945964587500*x^3 + 469 \\
& 144483264760000*x^2 - 3531015707557*\sqrt{2}*(97155*x^3 + 93872*x^ \\
& 2 + 69621*x + 22552) + 347945160104992500*x + 112708223821660000) \\
& *\sqrt{2*x^2 - x + 3}*\sqrt{((3531015707557*\sqrt{2}) - 4997704142500) \\
& /((17646971828890187454872500*\sqrt{2}) - 24956595274995091500033249 \\
&)) + 3184949732636*\sqrt{21989898227})*\sqrt{2}*(25*x^4 + 30*x^3 + 2 \\
& 9*x^2 + 12*x + 4)*\arctan(31*(\sqrt{1999081657}*7688^{(1/4)}*(3531015 \\
& 707557*\sqrt{2}*(x - 6) - 4997704142500*x + 29986224855000)*\sqrt{((\\
& 3531015707557*\sqrt{2}) - 4997704142500)/(1764697182889018745487250 \\
& 0*\sqrt{2}) - 24956595274995091500033249)} + 4*\sqrt{21989898227})*\sqrt{ \\
& \sqrt{2*x^2 - x + 3}*(2937349*\sqrt{2}) - 3957722))/(\sqrt{1999081657})* \\
& 7688^{(1/4)}*\sqrt{31}*(3531015707557*\sqrt{2}*(19*x - 22) - 94956378 \\
& 707500*x + 109949491135000)*\sqrt{((3531015707557*\sqrt{2}) - 4997704 \\
& 142500)/(17646971828890187454872500*\sqrt{2}) - 2495659527499509150 \\
& 0033249)} + 2*7688^{(1/4)}*\sqrt{31}*(3531015707557*\sqrt{2}*x - 4997 \\
& 704142500*x)*\sqrt{-\sqrt{2}*(2*\sqrt{21989898227})*\sqrt{1999081657})* \\
& 7688^{(1/4)}*\sqrt{2*x^2 - x + 3}*(\sqrt{2}*(550642599639613857505865 \\
& 878462487496460673694*x + 228083632794351023965079241658287769958 \\
& 016919) - 778726232433964881470945120120775266418690613*x - 32255 \\
& 8966845262833540786636804199726502656775)*\sqrt{((3531015707557*\sqrt{ \\
& \sqrt{2}) - 4997704142500)/(17646971828890187454872500*\sqrt{2}) - 24956 \\
& 595274995091500033249)} + 877305985610599641020614356284341193934 \\
& 81953320000*x^2 + 1999081657*\sqrt{2}*(122181083022638647732093092 \\
& 51619370427500*x^2 - 176316474134975767023509684266091812693*\sqrt{ \\
& \sqrt{2}*(49*x^2 - 151*x + 200) - 376517215028947669541756264692760190 \\
& 72500*x + 49869829805158631727384935720895389500000) - 3101745057 \\
& 5772759823665925386882097185256134362488*\sqrt{2}*(2*x^2 - x + 3) \\
& - 43865299280529982051030717814217059696740976660000*x + 13159589 \\
& 7841589946153092153442651179090222929980000)/(1763164741349757670 \\
& 23509684266091812693*\sqrt{2})*x^2 - 249349149025793158636924678604 \\
& 476947500*x^2))*\sqrt{((3531015707557*\sqrt{2}) - 4997704142500)/(176 \\
& 46971828890187454872500*\sqrt{2}) - 24956595274995091500033249)} - \\
& 124*\sqrt{21989898227})*\sqrt{31}*\sqrt{2*x^2 - x + 3}*(605427*\sqrt{2} \\
&) - 885694))) + 3184949732636*\sqrt{21989898227})*\sqrt{2}*(25*x^4 + \\
& 30*x^3 + 29*x^2 + 12*x + 4)*\arctan(-31*(\sqrt{1999081657}*7688^{(1 \\
& /4)}*(3531015707557*\sqrt{2}*(x - 6) - 4997704142500*x + 2998622485 \\
& 5000)*\sqrt{((3531015707557*\sqrt{2}) - 4997704142500)/(1764697182889 \\
& 0187454872500*\sqrt{2}) - 24956595274995091500033249)} - 4*\sqrt{219 \\
& 89898227})*\sqrt{2*x^2 - x + 3}*(2937349*\sqrt{2}) - 3957722))/(\sqrt{ \\
& 1999081657}*7688^{(1/4)}*\sqrt{31}*(3531015707557*\sqrt{2}*(19*x - 22 \\
&) - 94956378707500*x + 109949491135000)*\sqrt{((3531015707557*\sqrt{ \\
& \sqrt{2}) - 4997704142500)/(17646971828890187454872500*\sqrt{2}) - 2495659 \\
& 5274995091500033249)} + 2*7688^{(1/4)}*\sqrt{31}*(3531015707557*\sqrt{ \\
& \sqrt{2})*x - 4997704142500*x)*\sqrt{(\sqrt{2}*(2*\sqrt{21989898227})*\sqrt{1 \\
& 999081657}*7688^{(1/4)}*\sqrt{2*x^2 - x + 3}*(\sqrt{2}*(5506425996396 \\
& 13857505865878462487496460673694*x + 2280836327943510239650792416 \\
& 58287769958016919) - 77872623243396488147094512012077526641869061 \\
& 3*x - 322558966845262833540786636804199726502656775)*\sqrt{((353101 \\
& 5707557*\sqrt{2}) - 4997704142500)/(17646971828890187454872500*\sqrt{2}
\end{aligned}$$

(2) - 24956595274995091500033249)) - 8773059856105996410206143562
 8434119393481953320000*x^2 - 1999081657*sqrt(2)*(1221810830226386
 4773209309251619370427500*x^2 - 176316474134975767023509684266091
 812693*sqrt(2)*(49*x^2 - 151*x + 200) - 3765172150289476695417562
 6469276019072500*x + 49869829805158631727384935720895389500000) +
 31017450575772759823665925386882097185256134362488*sqrt(2)*(2*x^
 2 - x + 3) + 43865299280529982051030717814217059696740976660000*x
 - 131595897841589946153092153442651179090222929980000)/(17631647
 4134975767023509684266091812693*sqrt(2)*x^2 - 2493491490257931586
 36924678604476947500*x^2))*sqrt((3531015707557*sqrt(2) - 49977041
 42500)/(17646971828890187454872500*sqrt(2) - 24956595274995091500
 033249)) + 124*sqrt(21989898227)*sqrt(31)*sqrt(2*x^2 - x + 3)*(60
 5427*sqrt(2) - 885694)) - sqrt(21989898227)*sqrt(31)*(1249426035
 62500*x^4 + 149931124275000*x^3 + 144933420132500*x^2 - 353101570
 7557*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 599724497100
 00*x + 19990816570000)*log(-199908165700*sqrt(2)*(2*sqrt(21989898
 227)*sqrt(1999081657)*7688^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(55
 0642599639613857505865878462487496460673694*x + 22808363279435102
 3965079241658287769958016919) - 778726232433964881470945120120775
 266418690613*x - 322558966845262833540786636804199726502656775)*s
 qrt((3531015707557*sqrt(2) - 4997704142500)/(17646971828890187454
 872500*sqrt(2) - 24956595274995091500033249)) + 87730598561059964
 102061435628434119393481953320000*x^2 + 1999081657*sqrt(2)*(12218
 108302263864773209309251619370427500*x^2 - 1763164741349757670235
 09684266091812693*sqrt(2)*(49*x^2 - 151*x + 200) - 37651721502894
 766954175626469276019072500*x + 498698298051586317273849357208953
 89500000) - 31017450575772759823665925386882097185256134362488*sq
 rt(2)*(2*x^2 - x + 3) - 43865299280529982051030717814217059696740
 976660000*x + 131595897841589946153092153442651179090222929980000
)/(176316474134975767023509684266091812693*sqrt(2)*x^2 - 24934914
 9025793158636924678604476947500*x^2)) + sqrt(21989898227)*sqrt(31
)*(124942603562500*x^4 + 149931124275000*x^3 + 144933420132500*x^
 2 - 3531015707557*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) +
 59972449710000*x + 19990816570000)*log(199908165700*sqrt(2)*(2*s
 qrt(21989898227)*sqrt(1999081657)*7688^(1/4)*sqrt(2*x^2 - x + 3)*
 (sqrt(2)*(550642599639613857505865878462487496460673694*x + 22808
 3632794351023965079241658287769958016919) - 778726232433964881470
 945120120775266418690613*x - 322558966845262833540786636804199726
 502656775)*sqrt((3531015707557*sqrt(2) - 4997704142500)/(17646971
 828890187454872500*sqrt(2) - 24956595274995091500033249)) - 87730
 598561059964102061435628434119393481953320000*x^2 - 1999081657*sq
 rt(2)*(12218108302263864773209309251619370427500*x^2 - 1763164741
 34975767023509684266091812693*sqrt(2)*(49*x^2 - 151*x + 200) - 37
 651721502894766954175626469276019072500*x + 498698298051586317273
 84935720895389500000) + 31017450575772759823665925386882097185256
 134362488*sqrt(2)*(2*x^2 - x + 3) + 43865299280529982051030717814
 217059696740976660000*x - 131595897841589946153092153442651179090
 222929980000)/(176316474134975767023509684266091812693*sqrt(2)*x^
 2 - 249349149025793158636924678604476947500*x^2)))/((124942603562
 500*x^4 + 149931124275000*x^3 + 144933420132500*x^2 - 35310157075
 57*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 59972449710000
 *x + 19990816570000)*sqrt((3531015707557*sqrt(2) - 4997704142500)
 /(17646971828890187454872500*sqrt(2) - 24956595274995091500033249
)))

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

$$\int \frac{(2x^2 - x + 3)^{\frac{5}{2}}}{(5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3,x)

[Out] Integral((2*x**2 - x + 3)**(5/2)/(5*x**2 + 3*x + 2)**3, x)

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

undef

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")

[Out] undef

$$3.79 \quad \int \frac{(2+3x+5x^2)^4}{\sqrt{3-x+2x^2}} dx$$

Optimal. Leaf size=185

$$\begin{aligned} & -\frac{15428243\sqrt{2x^2-x+3x^2}}{131072} + \frac{1572007407\sqrt{2x^2-x+3x}}{7340032} + \frac{16493087661\sqrt{2x^2-x+3}}{29360128} \\ & + \frac{625}{16}\sqrt{2x^2-x+3x^7} + \frac{57375}{448}\sqrt{2x^2-x+3x^6} + \frac{2116475\sqrt{2x^2-x+3x^5}}{10752} \\ & + \frac{686531\sqrt{2x^2-x+3x^4}}{6144} - \frac{19750457\sqrt{2x^2-x+3x^3}}{229376} + \frac{2899366573 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8388608\sqrt{2}} \end{aligned}$$

[Out] (16493087661*sqrt[3 - x + 2*x^2])/29360128 + (1572007407*x*sqrt[3 - x + 2*x^2])/7340032 - (15428243*x^2*sqrt[3 - x + 2*x^2])/131072 - (19750457*x^3*sqrt[3 - x + 2*x^2])/229376 + (686531*x^4*sqrt[3 - x + 2*x^2])/6144 + (2116475*x^5*sqrt[3 - x + 2*x^2])/10752 + (57375*x^6*sqrt[3 - x + 2*x^2])/448 + (625*x^7*sqrt[3 - x + 2*x^2])/16 + (2899366573*ArcSinh[(1 - 4*x)/sqrt[23]])/(8388608*sqrt[2])

Rubi [A] time = 0.513263, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\begin{aligned} & -\frac{15428243\sqrt{2x^2-x+3x^2}}{131072} + \frac{1572007407\sqrt{2x^2-x+3x}}{7340032} + \frac{16493087661\sqrt{2x^2-x+3}}{29360128} \\ & + \frac{625}{16}\sqrt{2x^2-x+3x^7} + \frac{57375}{448}\sqrt{2x^2-x+3x^6} + \frac{2116475\sqrt{2x^2-x+3x^5}}{10752} \\ & + \frac{686531\sqrt{2x^2-x+3x^4}}{6144} - \frac{19750457\sqrt{2x^2-x+3x^3}}{229376} + \frac{2899366573 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8388608\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^4/Sqrt[3 - x + 2*x^2],x]

[Out] (16493087661*sqrt[3 - x + 2*x^2])/29360128 + (1572007407*x*sqrt[3 - x + 2*x^2])/7340032 - (15428243*x^2*sqrt[3 - x + 2*x^2])/131072 - (19750457*x^3*sqrt[3 - x + 2*x^2])/229376 + (686531*x^4*sqrt[3 - x + 2*x^2])/6144 + (2116475*x^5*sqrt[3 - x + 2*x^2])/10752 + (57375*x^6*sqrt[3 - x + 2*x^2])/448 + (625*x^7*sqrt[3 - x + 2*x^2])/16 + (2899366573*ArcSinh[(1 - 4*x)/sqrt[23]])/(8388608*sqrt[2])

Rubi in Sympy [A] time = 71.6786, size = 153, normalized size = 0.83

$$\frac{\left(-\frac{41075x}{2} + \frac{3837043}{8}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2}{134400} + \frac{\left(70x + \frac{207}{2}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^3}{224}$$

$$- \frac{\left(\frac{5922013305x}{8} + \frac{2296932969}{32}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)}{32256000}$$

$$+ \frac{\left(\frac{2393219058531x}{32} + \frac{19051129604481}{128}\right) \sqrt{2x^2 - x + 3}}{258048000} - \frac{2899366573\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{16777216}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(1/2),x)`

[Out] `-(-41075*x/2 + 3837043/8)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2/134400 + (70*x + 207/2)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3/224 - (5922013305*x/8 + 2296932969/32)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/32256000 + (2393219058531*x/32 + 19051129604481/128)*sqrt(2*x**2 - x + 3)/258048000 - 2899366573*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/16777216`

Mathematica [A] time = 0.11255, size = 75, normalized size = 0.41

$$\frac{4\sqrt{2x^2 - x + 3} (3440640000x^7 + 11280384000x^6 + 17338163200x^5 + 9842108416x^4 - 7584175488x^3 - 10367779296x^2 + 184000x - 7584175488)}{352321536}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^4/Sqrt[3 - x + 2*x^2],x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(49479262983 + 18864088884*x - 10367779296*x^2 - 7584175488*x^3 + 9842108416*x^4 + 17338163200*x^5 + 11280384000*x^6 + 3440640000*x^7) - 60886698033*ArcSinh[(-1 + 4*x)/Sqrt[23]])/352321536`

Maple [A] time = 0.025, size = 147, normalized size = 0.8

$$-\frac{2899366573\sqrt{2}}{16777216} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{16493087661}{29360128} \sqrt{2x^2 - x + 3} + \frac{1572007407x}{7340032} \sqrt{2x^2 - x + 3}$$

$$- \frac{15428243x^2}{131072} \sqrt{2x^2 - x + 3} - \frac{19750457x^3}{229376} \sqrt{2x^2 - x + 3} + \frac{686531x^4}{6144} \sqrt{2x^2 - x + 3}$$

$$+ \frac{2116475x^5}{10752} \sqrt{2x^2 - x + 3} + \frac{57375x^6}{448} \sqrt{2x^2 - x + 3} + \frac{625x^7}{16} \sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4/(2*x^2-x+3)^(1/2),x)`

[Out] $-2899366573/16777216 \cdot 2^{1/2} \cdot \operatorname{arcsinh}(4/23 \cdot 23^{1/2} \cdot (x-1/4)) + 16493087661/29360128 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 1572007407/7340032 \cdot x \cdot (2 \cdot x^2 - x + 3)^{1/2} - 15428243/131072 \cdot x^2 \cdot (2 \cdot x^2 - x + 3)^{1/2} - 19750457/229376 \cdot x^3 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 686531/6144 \cdot x^4 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 2116475/10752 \cdot x^5 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 57375/448 \cdot x^6 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 625/16 \cdot x^7 \cdot (2 \cdot x^2 - x + 3)^{1/2}$

Maxima [A] time = 0.784457, size = 200, normalized size = 1.08

$$\begin{aligned} & \frac{625}{16} \sqrt{2x^2 - x + 3} x^7 + \frac{57375}{448} \sqrt{2x^2 - x + 3} x^6 + \frac{2116475}{10752} \sqrt{2x^2 - x + 3} x^5 + \frac{686531}{6144} \sqrt{2x^2 - x + 3} x^4 \\ & - \frac{19750457}{229376} \sqrt{2x^2 - x + 3} x^3 - \frac{15428243}{131072} \sqrt{2x^2 - x + 3} x^2 + \frac{1572007407}{7340032} \sqrt{2x^2 - x + 3} x \\ & - \frac{2899366573}{16777216} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) + \frac{16493087661}{29360128} \sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4/sqrt(2*x^2 - x + 3),x, algorithm="maxima")`

[Out] $625/16 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^7 + 57375/448 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^6 + 2116475/10752 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^5 + 686531/6144 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^4 - 19750457/229376 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^3 - 15428243/131072 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^2 + 1572007407/7340032 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x - 2899366573/16777216 \cdot \sqrt{2} \cdot \operatorname{arcsinh}(1/23 \cdot \sqrt{23} \cdot (4 \cdot x - 1)) + 16493087661/29360128 \cdot \sqrt{2 \cdot x^2 - x + 3}$

Fricas [A] time = 0.284851, size = 130, normalized size = 0.7

$$\frac{1}{704643072} \sqrt{2} \left(4 \sqrt{2} (3440640000 x^7 + 11280384000 x^6 + 17338163200 x^5 + 9842108416 x^4 - 7584175488 x^3 - 10367779296 x^2 + 18864088884 x + 49479262983) \sqrt{2 \cdot x^2 - x + 3} + 60886698033 \log(-\sqrt{2} \cdot (32 \cdot x^2 - 16 \cdot x + 25) + 8 \cdot \sqrt{2 \cdot x^2 - x + 3}) \cdot (4 \right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4/sqrt(2*x^2 - x + 3),x, algorithm="fricas")`

[Out] $1/704643072 \cdot \sqrt{2} \cdot (4 \cdot \sqrt{2} \cdot (3440640000 \cdot x^7 + 11280384000 \cdot x^6 + 17338163200 \cdot x^5 + 9842108416 \cdot x^4 - 7584175488 \cdot x^3 - 10367779296 \cdot x^2 + 18864088884 \cdot x + 49479262983) \cdot \sqrt{2 \cdot x^2 - x + 3} + 60886698033 \cdot \log(-\sqrt{2} \cdot (32 \cdot x^2 - 16 \cdot x + 25) + 8 \cdot \sqrt{2 \cdot x^2 - x + 3}) \cdot (4$

*x - 1)))

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

$$\int \frac{(5x^2 + 3x + 2)^4}{\sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(1/2), x)

[Out] Integral((5*x**2 + 3*x + 2)**4/sqrt(2*x**2 - x + 3), x)

GIAC/XCAS [A] time = 0.277107, size = 112, normalized size = 0.61

$$\frac{1}{88080384} (4 (8 (4 (16 (100 (120 (140x + 459)x + 84659)x + 4805717)x - 59251371)x - 323993103)x + 4716022221)x + 49479262983) \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right) + \frac{2899366573}{16777216} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/sqrt(2*x^2 - x + 3), x, algorithm="giac")

[Out] 1/88080384*(4*(8*(4*(16*(100*(120*(140*x + 459)*x + 84659)*x + 4805717)*x - 59251371)*x - 323993103)*x + 4716022221)*x + 49479262983)*sqrt(2*x^2 - x + 3) + 2899366573/16777216*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.80 \quad \int \frac{(2+3x+5x^2)^3}{\sqrt{3-x+2x^2}} dx$$

Optimal. Leaf size=143

$$\begin{aligned} & -\frac{3387\sqrt{2x^2-x+3x^2}}{1024} - \frac{372783\sqrt{2x^2-x+3x}}{8192} - \frac{203373\sqrt{2x^2-x+3}}{32768} + \frac{125}{12}\sqrt{2x^2-x+3x^5} \\ & + \frac{1355}{48}\sqrt{2x^2-x+3x^4} + \frac{8185}{256}\sqrt{2x^2-x+3x^3} - \frac{9267707 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{65536\sqrt{2}} \end{aligned}$$

[Out] (-203373*sqrt[3 - x + 2*x^2])/32768 - (372783*x*sqrt[3 - x + 2*x^2])/8192 - (3387*x^2*sqrt[3 - x + 2*x^2])/1024 + (8185*x^3*sqrt[3 - x + 2*x^2])/256 + (1355*x^4*sqrt[3 - x + 2*x^2])/48 + (125*x^5*sqrt[3 - x + 2*x^2])/12 - (9267707*ArcSinh[(1 - 4*x)/sqrt[23]])/(65536*sqrt[2])

Rubi [A] time = 0.286926, antiderivative size = 143, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\begin{aligned} & -\frac{3387\sqrt{2x^2-x+3x^2}}{1024} - \frac{372783\sqrt{2x^2-x+3x}}{8192} - \frac{203373\sqrt{2x^2-x+3}}{32768} + \frac{125}{12}\sqrt{2x^2-x+3x^5} \\ & + \frac{1355}{48}\sqrt{2x^2-x+3x^4} + \frac{8185}{256}\sqrt{2x^2-x+3x^3} - \frac{9267707 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{65536\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^3/Sqrt[3 - x + 2*x^2],x]

[Out] (-203373*sqrt[3 - x + 2*x^2])/32768 - (372783*x*sqrt[3 - x + 2*x^2])/8192 - (3387*x^2*sqrt[3 - x + 2*x^2])/1024 + (8185*x^3*sqrt[3 - x + 2*x^2])/256 + (1355*x^4*sqrt[3 - x + 2*x^2])/48 + (125*x^5*sqrt[3 - x + 2*x^2])/12 - (9267707*ArcSinh[(1 - 4*x)/sqrt[23]])/(65536*sqrt[2])

Rubi in Sympy [A] time = 45.5465, size = 124, normalized size = 0.87

$$\frac{\left(-\frac{11685x}{2} + \frac{257403}{8}\right) \left(-\frac{779x^2}{4} + \frac{16103x}{4} + \frac{2207}{2}\right) \sqrt{2x^2 - x + 3}}{1121760} + \frac{\left(50x + \frac{151}{2}\right) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2}{120} - \frac{\left(\frac{47223864585x}{32} + \frac{46377749763}{128}\right) \sqrt{2x^2 - x + 3}}{8974080} + \frac{9267707\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{131072}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)`

[Out] `(-11685*x/2 + 257403/8)*(-779*x**2/4 + 16103*x/4 + 2207/2)*sqrt(2*x**2 - x + 3)/1121760 + (50*x + 151/2)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2/120 - (47223864585*x/32 + 46377749763/128)*sqrt(2*x**2 - x + 3)/8974080 + 9267707*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/131072`

Mathematica [A] time = 0.0860002, size = 65, normalized size = 0.45

$$\frac{4\sqrt{2x^2 - x + 3} (1024000x^5 + 2775040x^4 + 3143040x^3 - 325152x^2 - 4473396x - 610119) + 27803121\sqrt{2} \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{393216}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^3/Sqrt[3 - x + 2*x^2],x]`

[Out] `(4*Sqrt[3 - x + 2*x^2]*(-610119 - 4473396*x - 325152*x^2 + 3143040*x^3 + 2775040*x^4 + 1024000*x^5) + 27803121*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/393216`

Maple [A] time = 0.009, size = 113, normalized size = 0.8

$$\frac{9267707\sqrt{2}}{131072} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) - \frac{203373}{32768} \sqrt{2x^2 - x + 3} - \frac{372783x}{8192} \sqrt{2x^2 - x + 3} - \frac{3387x^2}{1024} \sqrt{2x^2 - x + 3} + \frac{8185x^3}{256} \sqrt{2x^2 - x + 3} + \frac{1355x^4}{48} \sqrt{2x^2 - x + 3} + \frac{125x^5}{12} \sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^3/(2*x^2-x+3)^(1/2),x)`

[Out] $9267707/131072 \cdot 2^{1/2} \cdot \operatorname{arcsinh}(4/23 \cdot 23^{1/2} \cdot (x-1/4)) - 203373/32768 \cdot (2 \cdot x^2 - x + 3)^{1/2} - 372783/8192 \cdot x \cdot (2 \cdot x^2 - x + 3)^{1/2} - 3387/1024 \cdot x^2 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 8185/256 \cdot x^3 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 1355/48 \cdot x^4 \cdot (2 \cdot x^2 - x + 3)^{1/2} + 125/12 \cdot x^5 \cdot (2 \cdot x^2 - x + 3)^{1/2}$

Maxima [A] time = 0.790606, size = 154, normalized size = 1.08

$$\frac{125}{12} \sqrt{2x^2 - x + 3} x^5 + \frac{1355}{48} \sqrt{2x^2 - x + 3} x^4 + \frac{8185}{256} \sqrt{2x^2 - x + 3} x^3 - \frac{3387}{1024} \sqrt{2x^2 - x + 3} x^2 - \frac{372783}{8192} \sqrt{2x^2 - x + 3} x + \frac{9267707}{131072} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{203373}{32768} \sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3/sqrt(2*x^2 - x + 3),x, algorithm="maxima")`

[Out] $125/12 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^5 + 1355/48 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^4 + 8185/256 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^3 - 3387/1024 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x^2 - 372783/8192 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot x + 9267707/131072 \cdot \sqrt{2} \cdot \operatorname{arcsinh}(1/23 \cdot \sqrt{23} \cdot (4 \cdot x - 1)) - 203373/32768 \cdot \sqrt{2 \cdot x^2 - x + 3}$

Fricas [A] time = 0.280654, size = 116, normalized size = 0.81

$$\frac{1}{786432} \sqrt{2} \left(4 \sqrt{2} (1024000 x^5 + 2775040 x^4 + 3143040 x^3 - 325152 x^2 - 4473396 x - 610119) \sqrt{2x^2 - x + 3} + 27803121 \log \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3/sqrt(2*x^2 - x + 3),x, algorithm="fricas")`

[Out] $1/786432 \cdot \sqrt{2} \cdot (4 \cdot \sqrt{2} \cdot (1024000 \cdot x^5 + 2775040 \cdot x^4 + 3143040 \cdot x^3 - 325152 \cdot x^2 - 4473396 \cdot x - 610119) \cdot \sqrt{2 \cdot x^2 - x + 3} + 27803121 \cdot \log(-\sqrt{2} \cdot (32 \cdot x^2 - 16 \cdot x + 25) - 8 \cdot \sqrt{2 \cdot x^2 - x + 3} \cdot (4 \cdot x - 1)))$

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

$$\int \frac{(5x^2 + 3x + 2)^3}{\sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)`

[Out] `Integral((5*x**2 + 3*x + 2)**3/sqrt(2*x**2 - x + 3), x)`

GIAC/XCAS [A] time = 0.27489, size = 99, normalized size = 0.69

$$\frac{1}{98304} (4(8(20(16(100x + 271)x + 4911)x - 10161)x - 1118349)x - 610119)\sqrt{2x^2 - x + 3} - \frac{9267707}{131072} \sqrt{2} \ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^3/sqrt(2*x^2 - x + 3),x, algorithm="giac")`

[Out] `1/98304*(4*(8*(20*(16*(100*x + 271)*x + 4911)*x - 10161)*x - 1118349)*x - 610119)*sqrt(2*x^2 - x + 3) - 9267707/131072*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)`

$$3.81 \quad \int \frac{(2+3x+5x^2)^2}{\sqrt{3-x+2x^2}} dx$$

Optimal. Leaf size=101

$$\frac{655}{96} \sqrt{2x^2 - x + 3x^2} + \frac{3443}{768} \sqrt{2x^2 - x + 3x} - \frac{11373 \sqrt{2x^2 - x + 3}}{1024} + \frac{25}{8} \sqrt{2x^2 - x + 3x^3} + \frac{30725 \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right)}{2048 \sqrt{2}}$$

[Out] $(-11373 * \text{Sqrt}[3 - x + 2 * x^2]) / 1024 + (3443 * x * \text{Sqrt}[3 - x + 2 * x^2]) / 768 + (655 * x^2 * \text{Sqrt}[3 - x + 2 * x^2]) / 96 + (25 * x^3 * \text{Sqrt}[3 - x + 2 * x^2]) / 8 + (30725 * \text{ArcSinh}[(1 - 4 * x) / \text{Sqrt}[23]]) / (2048 * \text{Sqrt}[2])$

Rubi [A] time = 0.160384, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{655}{96} \sqrt{2x^2 - x + 3x^2} + \frac{3443}{768} \sqrt{2x^2 - x + 3x} - \frac{11373 \sqrt{2x^2 - x + 3}}{1024} + \frac{25}{8} \sqrt{2x^2 - x + 3x^3} + \frac{30725 \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right)}{2048 \sqrt{2}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(2 + 3 * x + 5 * x^2)^2 / \text{Sqrt}[3 - x + 2 * x^2], x]$

[Out] $(-11373 * \text{Sqrt}[3 - x + 2 * x^2]) / 1024 + (3443 * x * \text{Sqrt}[3 - x + 2 * x^2]) / 768 + (655 * x^2 * \text{Sqrt}[3 - x + 2 * x^2]) / 96 + (25 * x^3 * \text{Sqrt}[3 - x + 2 * x^2]) / 8 + (30725 * \text{ArcSinh}[(1 - 4 * x) / \text{Sqrt}[23]]) / (2048 * \text{Sqrt}[2])$

Rubi in Sympy [A] time = 22.3852, size = 85, normalized size = 0.84

$$-\frac{\left(-\frac{203x}{2} + \frac{40199}{8}\right) \sqrt{2x^2 - x + 3}}{384} + \frac{(30x + \frac{95}{2}) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)}{48} - \frac{30725 \sqrt{2} \operatorname{atanh} \left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}} \right)}{4096}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{rubi_integrate}((5 * x^{**2} + 3 * x + 2)^{**2} / (2 * x^{**2} - x + 3)^{(1/2)}, x)$

[Out] $-(-203 * x / 2 + 40199 / 8) * \text{sqrt}(2 * x^{**2} - x + 3) / 384 + (30 * x + 95 / 2) * \text{sqrt}(2 * x^{**2} - x + 3) * (5 * x^{**2} + 3 * x + 2) / 48 - 30725 * \text{sqrt}(2) * \operatorname{atanh}(\text{sqrt}(2) * (4 * x - 1) / (4 * \text{sqrt}(2 * x^{**2} - x + 3))) / 4096$

Mathematica [A] time = 0.0627727, size = 55, normalized size = 0.54

$$\frac{4\sqrt{2x^2 - x + 3} (9600x^3 + 20960x^2 + 13772x - 34119) - 92175\sqrt{2} \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{12288}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^2/Sqrt[3 - x + 2*x^2], x]

[Out] (4*Sqrt[3 - x + 2*x^2]*(-34119 + 13772*x + 20960*x^2 + 9600*x^3) - 92175*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/12288

Maple [A] time = 0.01, size = 79, normalized size = 0.8

$$\begin{aligned} & -\frac{30725\sqrt{2}}{4096} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) - \frac{11373}{1024}\sqrt{2x^2 - x + 3} \\ & + \frac{3443x}{768}\sqrt{2x^2 - x + 3} + \frac{655x^2}{96}\sqrt{2x^2 - x + 3} + \frac{25x^3}{8}\sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^2/(2*x^2-x+3)^(1/2), x)

[Out] -30725/4096*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-11373/1024*(2*x^2-x+3)^(1/2)+3443/768*x*(2*x^2-x+3)^(1/2)+655/96*x^2*(2*x^2-x+3)^(1/2)+25/8*x^3*(2*x^2-x+3)^(1/2)

Maxima [A] time = 0.778093, size = 108, normalized size = 1.07

$$\begin{aligned} & \frac{25}{8}\sqrt{2x^2 - x + 3}x^3 + \frac{655}{96}\sqrt{2x^2 - x + 3}x^2 + \frac{3443}{768}\sqrt{2x^2 - x + 3} \\ & - \frac{30725}{4096}\sqrt{2} \operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) - \frac{11373}{1024}\sqrt{2x^2 - x + 3} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/sqrt(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 25/8*sqrt(2*x^2 - x + 3)*x^3 + 655/96*sqrt(2*x^2 - x + 3)*x^2 + 3443/768*sqrt(2*x^2 - x + 3)*x - 30725/4096*sqrt(2)*arsinh(1/23*sqrt(23)*(4*x - 1)) - 11373/1024*sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.274822, size = 103, normalized size = 1.02

$$\frac{1}{24576} \sqrt{2} \left(4 \sqrt{2} (9600x^3 + 20960x^2 + 13772x - 34119) \sqrt{2x^2 - x + 3} + 92175 \log \left(-\sqrt{2} (32x^2 - 16x + 25) + 8 \sqrt{2x^2 - x + 3} \right) \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/sqrt(2*x^2 - x + 3),x, algorithm="fricas")

[Out] 1/24576*sqrt(2)*(4*sqrt(2)*(9600*x^3 + 20960*x^2 + 13772*x - 34119)*sqrt(2*x^2 - x + 3) + 92175*log(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))

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

$$\int \frac{(5x^2 + 3x + 2)^2}{\sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2),x)

[Out] Integral((5*x**2 + 3*x + 2)**2/sqrt(2*x**2 - x + 3), x)

GIAC/XCAS [A] time = 0.273535, size = 85, normalized size = 0.84

$$\frac{1}{3072} (4(40(60x + 131)x + 3443)x - 34119) \sqrt{2x^2 - x + 3} + \frac{30725}{4096} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/sqrt(2*x^2 - x + 3),x, algorithm="giac")

[Out] 1/3072*(4*(40*(60*x + 131)*x + 3443)*x - 34119)*sqrt(2*x^2 - x + 3) + 30725/4096*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)

$$3.82 \quad \int \frac{2+3x+5x^2}{\sqrt{3-x+2x^2}} dx$$

Optimal. Leaf size=59

$$\frac{5}{4}\sqrt{2x^2-x+3} + \frac{39}{16}\sqrt{2x^2-x+3} + \frac{17 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32\sqrt{2}}$$

[Out] (39*Sqrt[3 - x + 2*x^2])/16 + (5*x*Sqrt[3 - x + 2*x^2])/4 + (17*ArcSinh[(1 - 4*x)/Sqrt[23]])/(32*Sqrt[2])

Rubi [A] time = 0.0727913, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{5}{4}\sqrt{2x^2-x+3} + \frac{39}{16}\sqrt{2x^2-x+3} + \frac{17 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)/Sqrt[3 - x + 2*x^2], x]

[Out] (39*Sqrt[3 - x + 2*x^2])/16 + (5*x*Sqrt[3 - x + 2*x^2])/4 + (17*ArcSinh[(1 - 4*x)/Sqrt[23]])/(32*Sqrt[2])

Rubi in Sympy [A] time = 9.67027, size = 53, normalized size = 0.9

$$\frac{(10x + \frac{39}{2})\sqrt{2x^2-x+3}}{8} - \frac{17\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(1/2), x)

[Out] (10*x + 39/2)*sqrt(2*x**2 - x + 3)/8 - 17*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/64

Mathematica [A] time = 0.0501154, size = 46, normalized size = 0.78

$$\left(\frac{5x}{4} + \frac{39}{16}\right) \sqrt{2x^2 - x + 3} - \frac{17 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{32\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)/Sqrt[3 - x + 2*x^2], x]

[Out] (39/16 + (5*x)/4)*Sqrt[3 - x + 2*x^2] - (17*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(32*Sqrt[2])

Maple [A] time = 0.007, size = 45, normalized size = 0.8

$$-\frac{17\sqrt{2}}{64} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{39}{16}\sqrt{2x^2 - x + 3} + \frac{5x}{4}\sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)/(2*x^2-x+3)^(1/2), x)

[Out] -17/64*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+39/16*(2*x^2-x+3)^(1/2)+5/4*x*(2*x^2-x+3)^(1/2)

Maxima [A] time = 0.783725, size = 62, normalized size = 1.05

$$\frac{5}{4}\sqrt{2x^2 - x + 3} - \frac{17}{64}\sqrt{2} \operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) + \frac{39}{16}\sqrt{2x^2 - x + 3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/sqrt(2*x^2 - x + 3), x, algorithm="maxima")

[Out] 5/4*sqrt(2*x^2 - x + 3)*x - 17/64*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) + 39/16*sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.281637, size = 89, normalized size = 1.51

$$\frac{1}{128}\sqrt{2}\left(4\sqrt{2}\sqrt{2x^2 - x + 3}(20x + 39) + 17 \log\left(-\sqrt{2}(32x^2 - 16x + 25) + 8\sqrt{2x^2 - x + 3}(4x - 1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/sqrt(2*x^2 - x + 3),x, algorithm="fricas")`

[Out] $1/128*\sqrt{2}*(4*\sqrt{2}*\sqrt{2*x^2 - x + 3}*(20*x + 39) + 17*\log(-\sqrt{2}*(32*x^2 - 16*x + 25) + 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)))$

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

$$\int \frac{5x^2 + 3x + 2}{\sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(1/2),x)`

[Out] `Integral((5*x**2 + 3*x + 2)/sqrt(2*x**2 - x + 3), x)`

GIAC/XCAS [A] time = 0.271618, size = 72, normalized size = 1.22

$$\frac{1}{16}\sqrt{2x^2 - x + 3}(20x + 39) + \frac{17}{64}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/sqrt(2*x^2 - x + 3),x, algorithm="giac")`

[Out] $1/16*\sqrt{2*x^2 - x + 3}*(20*x + 39) + 17/64*\sqrt{2}*\ln(-2*\sqrt{2}*(\sqrt{2}*x - \sqrt{2*x^2 - x + 3}) + 1)$

$$3.83 \quad \int \frac{1}{\sqrt{3-x+2x^2}(2+3x+5x^2)} dx$$

Optimal. Leaf size=148

$$\begin{aligned} & \sqrt{\frac{1}{682} (13 + 10\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(13+10\sqrt{2})}} \left((13 + 10\sqrt{2})x + 3\sqrt{2} + 7 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \sqrt{\frac{1}{682} (10\sqrt{2} - 13)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(10\sqrt{2}-13)}} \left((13 - 10\sqrt{2})x - 3\sqrt{2} + 7 \right)}{\sqrt{2x^2 - x + 3}} \right) \end{aligned}$$

[Out] Sqrt[(13 + 10*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(13 + 10*Sqrt[2]))]*(7 + 3*Sqrt[2] + (13 + 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]] - Sqrt[(-13 + 10*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-13 + 10*Sqrt[2]))]*(7 - 3*Sqrt[2] + (13 - 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]

Rubi [A] time = 0.627494, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\begin{aligned} & \sqrt{\frac{1}{682} (13 + 10\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(13+10\sqrt{2})}} \left((13 + 10\sqrt{2})x + 3\sqrt{2} + 7 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \sqrt{\frac{1}{682} (10\sqrt{2} - 13)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(10\sqrt{2}-13)}} \left((13 - 10\sqrt{2})x - 3\sqrt{2} + 7 \right)}{\sqrt{2x^2 - x + 3}} \right) \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)), x]

[Out] Sqrt[(13 + 10*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(13 + 10*Sqrt[2]))]*(7 + 3*Sqrt[2] + (13 + 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]] - Sqrt[(-13 + 10*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-13 + 10*Sqrt[2]))]*(7 - 3*Sqrt[2] + (13 - 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]

Rubi in Sympy [A] time = 55.0243, size = 172, normalized size = 1.16

$$\frac{\sqrt{682} (22 + 22\sqrt{2}) (33\sqrt{2} + 77) \operatorname{atan} \left(\frac{\sqrt{341} (x(143 + 110\sqrt{2}) + 33\sqrt{2} + 77)}{341\sqrt{13 + 10\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{165044\sqrt{13 + 10\sqrt{2}}} + \frac{\sqrt{682} (-33\sqrt{2} + 77) (-22\sqrt{2} + 22) \operatorname{atanh} \left(\frac{\sqrt{341} (x(-110\sqrt{2} + 143) - 33\sqrt{2} + 77)}{341\sqrt{-13 + 10\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{165044\sqrt{-13 + 10\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(5*x**2+3*x+2)/(2*x**2-x+3)**(1/2), x)`

[Out] `sqrt(682)*(22 + 22*sqrt(2))*(33*sqrt(2) + 77)*atan(sqrt(341)*(x*(143 + 110*sqrt(2)) + 33*sqrt(2) + 77)/(341*sqrt(13 + 10*sqrt(2))*sqrt(2*x**2 - x + 3)))/(165044*sqrt(13 + 10*sqrt(2))) + sqrt(682)*(-33*sqrt(2) + 77)*(-22*sqrt(2) + 22)*atanh(sqrt(341)*(x*(-110*sqrt(2) + 143) - 33*sqrt(2) + 77)/(341*sqrt(-13 + 10*sqrt(2))*sqrt(2*x**2 - x + 3)))/(165044*sqrt(-13 + 10*sqrt(2)))`

Mathematica [C] time = 6.41329, size = 959, normalized size = 6.48

$$\begin{aligned}
 & 5i \tan^{-1} \left(\frac{11(550x^4 - 2200x^3 - 62i\sqrt{31}x^2 + 1906x^2 + 31i\sqrt{31}x + 1797x - 93i\sqrt{31} + 1100i\sqrt{31}x^4 - 550\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3x^3} - 110\sqrt{31}x^3 + 6820ix^3 + 1245\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3x^2} - 1078\sqrt{31}x^2 - 1364ix^2 + 725\sqrt{22(-13+i\sqrt{31})}}{\sqrt{\frac{341}{2}(-13+i\sqrt{31})}} \right) \\
 & 5 \tan^{-1} \left(\frac{31(100ix^2 - 50ix + 11\sqrt{31} + 7i)(2x^2 - x + 3)}{-1100i\sqrt{31}x^4 + 100i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3x^3} - 110i\sqrt{31}x^3 + 6820x^3 + 35i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3x^2} - 1078i\sqrt{31}x^2 - 1364x^2 + 25i\sqrt{682(13+i\sqrt{31})}}{\sqrt{\frac{341}{2}(13+i\sqrt{31})}} \right) \\
 & + \frac{5i \log\left(\left(-10ix + \sqrt{31} - 3i\right)^2 \left(10ix + \sqrt{31} + 3i\right)^2\right)}{\sqrt{682(13+i\sqrt{31})}} - \frac{5 \log\left(\left(-10ix + \sqrt{31} - 3i\right)^2 \left(10ix + \sqrt{31} + 3i\right)^2\right)}{\sqrt{682(-13+i\sqrt{31})}} \\
 & + \frac{5 \log\left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3x} - 22\sqrt{31}x + 469ix + i\sqrt{682(-13+i\sqrt{31})}\right)\right)}{\sqrt{682(-13+i\sqrt{31})}} \\
 & + \frac{5i \log\left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3x} - 22\sqrt{31}x + 1041ix - 63i\sqrt{22(13+i\sqrt{31})}\right)\right)}{\sqrt{682(13+i\sqrt{31})}}
 \end{aligned}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)),x]

[Out] ((-5*I)*ArcTan[(11*(1759 - (93*I)*Sqrt[31] + 1797*x + (31*I)*Sqrt[31]*x + 1906*x^2 - (62*I)*Sqrt[31]*x^2 - 2200*x^3 + 550*x^4))/(3069*I + 363*Sqrt[31] + (9207*I)*x - 1111*Sqrt[31]*x - (1364*I)*x^2 - 1078*Sqrt[31]*x^2 + (6820*I)*x^3 - 110*Sqrt[31]*x^3 - 1100*Sqrt[31]*x^4 + 630*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + 725*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + 1245*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - 550*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2]])/Sqrt[(341*(-13 + I*Sqrt[31]))/2] - (5*ArcTan[(31*(7*I + 11*Sqrt[31] - (50*I)*x + (100*I)*x^2)*(3 - x + 2*x^2))/(3069 + (363*I)*Sqrt[31] + 9207*x - (1111*I)*Sqrt[31]*x - 1364*x^2 - (1078*I)*Sqrt[31]*x^2 + 6820*x^3 - (110*I)*Sqrt[31]*x^3 - (1100*I)*Sqrt[31]*x^4 - (10*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (25*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (35*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (100*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2]])/Sqrt[(341*(13 + I*Sqrt[31]))/2] - (5*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2]

$$\begin{aligned} &)/\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])] + ((5*I)*\text{Log}[(-3*I + \text{Sqrt}[31] - (10*I)*x)^2*(3*I + \text{Sqrt}[31] + (10*I)*x)^2])/\text{Sqrt}[682*(13 + I*\text{Sqrt}[31])] \\ &+ (5*\text{Log}[(2 + 3*x + 5*x^2)*(-142*I + 66*\text{Sqrt}[31] + (469*I)*x - 22*\text{Sqrt}[31]*x + (327*I)*x^2 + 44*\text{Sqrt}[31]*x^2 + I*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])]) \\ &*\text{Sqrt}[3 - x + 2*x^2] - (4*I)*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])]*x*\text{Sqrt}[3 - x + 2*x^2]))/\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])] - \\ &((5*I)*\text{Log}[(2 + 3*x + 5*x^2)*(-1858*I + 66*\text{Sqrt}[31] + (1041*I)*x - 22*\text{Sqrt}[31]*x - (817*I)*x^2 + 44*\text{Sqrt}[31]*x^2 - (63*I)*\text{Sqrt}[22*(13 + I*\text{Sqrt}[31])] \\ &*\text{Sqrt}[3 - x + 2*x^2] + (22*I)*\text{Sqrt}[22*(13 + I*\text{Sqrt}[31])]*x*\text{Sqrt}[3 - x + 2*x^2]))/\text{Sqrt}[682*(13 + I*\text{Sqrt}[31])] \end{aligned}$$

Maple [B] time = 0.006, size = 684, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(5*x^2+3*x+2)/(2*x^2-x+3)^{(1/2)}, x)$

[Out] $\frac{1}{21142} * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} * 2^{(1/2)} * (369 * 2^{(1/2)} * \arctan(1/11692487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)})) * (-23 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x)) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)} * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} + 520 * \arctan(1/11692487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)}) * (-23 * (8 + 3 * 2^{(1/2)}) * (-23 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x)) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)} * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} + 465124 * \text{arctanh}(31/2 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}) * 2^{(1/2)} - 866822 * \text{arctanh}(31/2 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}) / ((8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} / (1 + (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x)))^{(1/2)} / (1 + (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x)) / (8 + 3 * 2^{(1/2)}) / (-8866 + 6820 * 2^{(1/2)})^{(1/2)}$

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

$$\int \frac{1}{(5x^2 + 3x + 2)\sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)
```

Fricas [A] time = 0.330157, size = 1299, normalized size = 8.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] 1/422840*sqrt(341)*sqrt(31)*sqrt(5)*(200^(1/4)*sqrt(31)*(10*sqrt(2) - 13)*log(-40*(sqrt(341)*200^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)
*(sqrt(2)*(86551*x + 35845) - 122396*x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 3464300*x^2 + 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) - 49985*sqrt(2)*(49*x^2 - 151*x + 200) - 10675700*x + 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2)) - 200^(1/4)*sqrt(31)*(10*sqrt(2) - 13)*log(40*(sqrt(341)*200^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(86551*x + 35845) - 122396*x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 3464300*x^2 - 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) + 49985*sqrt(2)*(49*x^2 - 151*x + 200) + 10675700*x - 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2)) + 124*200^(1/4)*arctan(155*(sqrt(341)*sqrt(5)*(10*sqrt(2)*(x - 6) - 13*x + 78)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 11*200^(1/4)*sqrt(2*x^2 - x + 3)*(7*sqrt(2) - 6))/(2*sqrt(341)*sqrt(31)*sqrt(10)*sqrt(5)*(10*sqrt(2)*x - 13*x)*sqrt(-(sqrt(341)*200^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(86551*x + 35845) - 122396*x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 3464300*x^2 + 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) - 49985*sqrt(2)*(49*x^2 - 151*x + 200) - 10675700*x + 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2))*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 5*sqrt(341)*sqrt(31)*sqrt(5)*(10*sqrt(2)*(19*x - 22) - 247*x + 286)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 1705*200^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) - 2))) + 124*200^(1/4)*arctan(-155*(sqrt(341)*sqrt(5)*(10*sqrt(2)*(x - 6) - 13*x + 78)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 11*200^(1/4)*sqrt(2*x^2 - x + 3)*(7*sqrt(2) - 6))/(2*sqrt(341)*sqrt(31)*sqrt(10)*sqrt(5)*(10*sqrt(2)*x - 13*x)*sqrt((sqrt(341)*200^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(86551*x + 35845) - 122396*x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 3464300*x^2 - 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) + 49985*sqrt(2)*(49*x^2 - 151*x + 200) + 10675700*x - 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2))*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 5*sqrt(341)*sqrt(31)*sqrt(5)*(10*sqrt(2)*(19*x - 22) - 247*x + 286)*sqrt((13*sqrt(2) - 20)/(260*s
```

```

qrt(2) - 369)) + 1705*200^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) - 2)))/((10*sqrt(2) - 13)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)))

```

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

$$\int \frac{1}{\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(5*x**2+3*x+2)/(2*x**2-x+3)**(1/2), x)
```

```
[Out] Integral(1/(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.84 \quad \int \frac{1}{\sqrt{3-x+2x^2}(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=188

$$\frac{\sqrt{2x^2 - x + 3}(65x + 4)}{682(5x^2 + 3x + 2)} + \frac{\sqrt{\frac{1}{682}(2343727 + 1678700\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(2343727+1678700\sqrt{2})}}((5751+3935\sqrt{2})x+1816\sqrt{2}+2119)}}{\sqrt{2x^2-x+3}}\right)}{1364} - \frac{\sqrt{\frac{1}{682}(1678700\sqrt{2} - 2343727)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(1678700\sqrt{2}-2343727)}}((5751-3935\sqrt{2})x-1816\sqrt{2}+2119)}}{\sqrt{2x^2-x+3}}\right)}{1364}$$

[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(682*(2 + 3*x + 5*x^2)) + (Sqrt[(2343727 + 1678700*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(2343727 + 1678700*Sqrt[2]))])*(2119 + 1816*Sqrt[2] + (5751 + 3935*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/1364 - (Sqrt[(-2343727 + 1678700*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-2343727 + 1678700*Sqrt[2]))])*(2119 - 1816*Sqrt[2] + (5751 - 3935*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/1364

Rubi [A] time = 0.884934, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{\sqrt{2x^2 - x + 3}(65x + 4)}{682(5x^2 + 3x + 2)} + \frac{\sqrt{\frac{1}{682}(2343727 + 1678700\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(2343727+1678700\sqrt{2})}}((5751+3935\sqrt{2})x+1816\sqrt{2}+2119)}}{\sqrt{2x^2-x+3}}\right)}{1364} - \frac{\sqrt{\frac{1}{682}(1678700\sqrt{2} - 2343727)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(1678700\sqrt{2}-2343727)}}((5751-3935\sqrt{2})x-1816\sqrt{2}+2119)}}{\sqrt{2x^2-x+3}}\right)}{1364}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2), x]

[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(682*(2 + 3*x + 5*x^2)) + (Sqrt[(2343727 + 1678700*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(2343727 + 1678700*Sqrt[2]))])*(2119 + 1816*Sqrt[2] + (5751 + 3935*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/1364 - (Sqrt[(-2343727 + 1678700*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-2343727 + 1678700*Sqrt[2]))])*(2119 - 1816*Sqrt[2] + (5751 - 3935*Sqrt[2])*x)/Sqrt[3 - x + 2*x^2]])/1364

)/Sqrt[3 - x + 2*x^2]]/1364 - (Sqrt[(-2343727 + 1678700*Sqrt[2])
/682]*ArcTanh[(Sqrt[11/(31*(-2343727 + 1678700*Sqrt[2]))])*(2119 -
1816*Sqrt[2] + (5751 - 3935*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]])/1
364

Rubi in Sympy [A] time = 77.5236, size = 216, normalized size = 1.15

$$\frac{(715x + 44)\sqrt{2x^2 - x + 3}}{7502(5x^2 + 3x + 2)} + \frac{\sqrt{682} \left(\frac{256399}{2} + 109868\sqrt{2} \right) (40172\sqrt{2} + 64977) \operatorname{atan} \left(\frac{2\sqrt{341} \left(x \left(\frac{476135\sqrt{2}}{2} + \frac{695871}{2} \right) + \frac{256399}{2} + 109868\sqrt{2} \right)}{3751\sqrt{2343727 + 1678700\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{6809880484\sqrt{2343727 + 1678700\sqrt{2}}} + \frac{\sqrt{682} \left(-109868\sqrt{2} + \frac{256399}{2} \right) (-40172\sqrt{2} + 64977) \operatorname{atanh} \left(\frac{2\sqrt{341} \left(x \left(-\frac{476135\sqrt{2}}{2} + \frac{695871}{2} \right) - 109868\sqrt{2} + \frac{256399}{2} \right)}{3751\sqrt{-2343727 + 1678700\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{6809880484\sqrt{-2343727 + 1678700\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2),x)`

[Out] `(715*x + 44)*sqrt(2*x**2 - x + 3)/(7502*(5*x**2 + 3*x + 2)) + sqrt(682)*(256399/2 + 109868*sqrt(2))*(40172*sqrt(2) + 64977)*atan(2*sqrt(341)*(x*(476135*sqrt(2)/2 + 695871/2) + 256399/2 + 109868*sqrt(2))/(3751*sqrt(2343727 + 1678700*sqrt(2))*sqrt(2*x**2 - x + 3)))/(6809880484*sqrt(2343727 + 1678700*sqrt(2))) + sqrt(682)*(-109868*sqrt(2) + 256399/2)*(-40172*sqrt(2) + 64977)*atanh(2*sqrt(341)*(x*(-476135*sqrt(2)/2 + 695871/2) - 109868*sqrt(2) + 256399/2)/(3751*sqrt(-2343727 + 1678700*sqrt(2))*sqrt(2*x**2 - x + 3)))/(6809880484*sqrt(-2343727 + 1678700*sqrt(2)))`

Mathematica [C] time = 6.44877, size = 1147, normalized size = 6.1

$$\frac{\sqrt{2x^2 - x + 3}(65x + 4)}{682(5x^2 + 3x + 2)}$$

$$5i(-787i + 41\sqrt{31}) \tan^{-1} \left(\frac{31(73964\sqrt{31}x^4 + 299597ix^4 + 291346\sqrt{31}x^3 - 31033201i\sqrt{31}x^4 + 44012188x^4 + 1342960i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 - 14709760i\sqrt{31}x^3 + 81775210x^3 + 470036i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^2 - 16719852\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix + 1041ix - 60}{-31033201i\sqrt{31}x^4 + 44012188x^4 + 1342960i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 - 14709760i\sqrt{31}x^3 + 81775210x^3 + 470036i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^2 - 16719852\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix + 1041ix - 60} \right)$$

$$5i(787i + 41\sqrt{31}) \tanh^{-1} \left(\frac{31033201\sqrt{31}x^4 - 44012188ix^4 + 7386280\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 14709760\sqrt{31}x^3 - 81775210ix^3 - 16719852\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^2 - 2292884\sqrt{31}x^4 + 155225093ix^4 + 9031726\sqrt{31}x^3 - 14709760i\sqrt{31}x^3 + 81775210ix^3 + 470036i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^2 - 16719852\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix + 1041ix - 60}{2292884\sqrt{31}x^4 + 155225093ix^4 + 9031726\sqrt{31}x^3 - 14709760i\sqrt{31}x^3 + 81775210ix^3 + 470036i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^2 - 16719852\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix + 1041ix - 60} \right)$$

$$5i(787i + 41\sqrt{31}) \log \left(\frac{\left((-10ix + \sqrt{31} - 3i) \right)^2 \left(10ix + \sqrt{31} + 3i \right)^2}{2728\sqrt{682(-13+i\sqrt{31})}} \right)$$

$$+ \frac{5(-787i + 41\sqrt{31}) \log \left(\frac{\left((-10ix + \sqrt{31} - 3i) \right)^2 \left(10ix + \sqrt{31} + 3i \right)^2}{2728\sqrt{682(13+i\sqrt{31})}} \right)}{2728\sqrt{682(-13+i\sqrt{31})}}$$

$$5i(787i + 41\sqrt{31}) \log \left(\frac{(5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix + 1041ix - 60 \right)}{2728\sqrt{682(-13+i\sqrt{31})}} \right)$$

$$5(-787i + 41\sqrt{31}) \log \left(\frac{(5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 1041ix - 60 \right)}{2728\sqrt{682(13+i\sqrt{31})}} \right)$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2), x]

[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(682*(2 + 3*x + 5*x^2)) - (((5*I)/1364)*(-787*I + 41*Sqrt[31])*ArcTan[(31*(802246*I + 546546*Sqrt[31] - (3387270*I)*x + 310310*Sqrt[31]*x + (2284079*I)*x^2 + 311146*Sqrt[31]*x^2 - (3529208*I)*x^3 + 291346*Sqrt[31]*x^3 + (299597*I)*x^4 + 73964*Sqrt[31]*x^4))/(20294274 + (5110826*I)*Sqrt[31] + 148907198*x - (9626874*I)*Sqrt[31]*x + 27657146*x^2 - (35512659*I)*Sqrt[31]*x^2 + 81775210*x^3 - (14709760*I)*Sqrt[31]*x^3 + 44012188*x^4 - (31033201*I)*Sqrt[31]*x^4 - (134296*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (335740*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (470036*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])

$$\begin{aligned}
& [31])) * x^2 * \text{Sqrt}[3 - x + 2 * x^2] + (1342960 * I) * \text{Sqrt}[682 * (13 + I * \text{Sqrt}[31])] * x^3 * \text{Sqrt}[3 - x + 2 * x^2]) / \text{Sqrt}[682 * (13 + I * \text{Sqrt}[31])] - \\
& (((5 * I) / 1364) * (787 * I + 41 * \text{Sqrt}[31]) * \text{ArcTanh}[(-20294274 * I - 5110826 * \text{Sqrt}[31] - (148907198 * I) * x + 9626874 * \text{Sqrt}[31] * x - (27657146 * I) * x^2 + 35512659 * \text{Sqrt}[31] * x^2 - (81775210 * I) * x^3 + 14709760 * \text{Sqrt}[31] * x^3 - (44012188 * I) * x^4 + 31033201 * \text{Sqrt}[31] * x^4 - 8460648 * \text{Sqrt}[22 * (-13 + I * \text{Sqrt}[31])] * \text{Sqrt}[3 - x + 2 * x^2] - 9736460 * \text{Sqrt}[22 * (-13 + I * \text{Sqrt}[31])] * x * \text{Sqrt}[3 - x + 2 * x^2] - 16719852 * \text{Sqrt}[22 * (-13 + I * \text{Sqrt}[31])] * x^2 * \text{Sqrt}[3 - x + 2 * x^2] + 7386280 * \text{Sqrt}[22 * (-13 + I * \text{Sqrt}[31])] * x^3 * \text{Sqrt}[3 - x + 2 * x^2]) / (243722374 * I + 16942926 * \text{Sqrt}[31] + (305106410 * I) * x + 9619610 * \text{Sqrt}[31] * x + (362298151 * I) * x^2 + 9645526 * \text{Sqrt}[31] * x^2 - (298854392 * I) * x^3 + 9031726 * \text{Sqrt}[31] * x^3 + (155225093 * I) * x^4 + 2292884 * \text{Sqrt}[31] * x^4)) / \text{Sqrt}[682 * (-13 + I * \text{Sqrt}[31])] - (5 * (-787 * I + 41 * \text{Sqrt}[31]) * \text{Log}[(-3 * I + \text{Sqrt}[31] - (10 * I) * x)^2 * (3 * I + \text{Sqrt}[31] + (10 * I) * x)^2]) / (2728 * \text{Sqrt}[682 * (13 + I * \text{Sqrt}[31])]) + (((5 * I) / 2728) * (787 * I + 41 * \text{Sqrt}[31]) * \text{Log}[(-3 * I + \text{Sqrt}[31] - (10 * I) * x)^2 * (3 * I + \text{Sqrt}[31] + (10 * I) * x)^2]) / \text{Sqrt}[682 * (-13 + I * \text{Sqrt}[31])] - (((5 * I) / 2728) * (787 * I + 41 * \text{Sqrt}[31]) * \text{Log}[(2 + 3 * x + 5 * x^2) * (-142 * I + 66 * \text{Sqrt}[31] + (469 * I) * x - 22 * \text{Sqrt}[31] * x + (327 * I) * x^2 + 44 * \text{Sqrt}[31] * x^2 + I * \text{Sqrt}[682 * (-13 + I * \text{Sqrt}[31])] * \text{Sqrt}[3 - x + 2 * x^2] - (4 * I) * \text{Sqrt}[682 * (-13 + I * \text{Sqrt}[31])] * x * \text{Sqrt}[3 - x + 2 * x^2])) / \text{Sqrt}[682 * (-13 + I * \text{Sqrt}[31])] + (5 * (-787 * I + 41 * \text{Sqrt}[31]) * \text{Log}[(2 + 3 * x + 5 * x^2) * (-1858 * I + 66 * \text{Sqrt}[31] + (1041 * I) * x - 22 * \text{Sqrt}[31] * x - (817 * I) * x^2 + 44 * \text{Sqrt}[31] * x^2 - (63 * I) * \text{Sqrt}[22 * (13 + I * \text{Sqrt}[31])] * \text{Sqrt}[3 - x + 2 * x^2] + (22 * I) * \text{Sqrt}[22 * (13 + I * \text{Sqrt}[31])] * x * \text{Sqrt}[3 - x + 2 * x^2])) / (2728 * \text{Sqrt}[682 * (13 + I * \text{Sqrt}[31])])
\end{aligned}$$

Maple [B] time = 0.009, size = 5225, normalized size = 27.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(5*x^2+3*x+2)^2/(2*x^2-x+3)^(1/2),x)`

[Out] result too large to display

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

$$\int \frac{1}{(5x^2 + 3x + 2)^2 \sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^2 * sqrt(2*x^2 - x + 3)),x, algorithm="maxima")`

[Out] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)), x)

Fricas [A] time = 0.362036, size = 1505, normalized size = 8.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")

[Out]
$$\begin{aligned} & -1/2641240152695936*930248^{(3/4)}*\sqrt{33574}*\sqrt{31}*(4*930248^{(1/4)}*\sqrt{33574}*\sqrt{31}*\sqrt{2*x^2 - x + 3}*(2343727*\sqrt{2}*(6 \\ & 5*x + 4) - 218231000*x - 13429600)*\sqrt{(2343727*\sqrt{2} - 335740 \\ & 0)/(7868829029800*\sqrt{2} - 11129123630529)} + 8422204*\sqrt{16787} \\ &)*\sqrt{2}*(5*x^2 + 3*x + 2)*\arctan(520397*(930248^{(1/4)}*\sqrt{3357 \\ & 4}*(2343727*\sqrt{2}*(x - 6) - 3357400*x + 20144400)*\sqrt{(2343727 \\ & *\sqrt{2} - 3357400)/(7868829029800*\sqrt{2} - 11129123630529)} + 8 \\ & 8*\sqrt{16787}*\sqrt{2*x^2 - x + 3}*(1816*\sqrt{2} - 2119))/(2*93024 \\ & 8^{(1/4)}*\sqrt{33574}*\sqrt{16787}*\sqrt{31}*(2343727*\sqrt{2}*x - 335 \\ & 7400*x)*\sqrt{-\sqrt{2}*(930248^{(1/4)}*\sqrt{33574}*\sqrt{16787}*\sqrt{ \\ & 2*x^2 - x + 3}*(\sqrt{2}*(189489825488457357396643*x + 78489272699 \\ & 663150388575) - 267979098188120507785218*x - 11100055278879420700 \\ & 8068)*\sqrt{(2343727*\sqrt{2} - 3357400)/(7868829029800*\sqrt{2} - 1 \\ & 1129123630529)} + 219371611293533385864425600*x^2 + 16787*\sqrt{2} \\ & *(3638234995621319496200*x^2 - 52502434123859361583*\sqrt{2}*(49*x \\ & ^2 - 151*x + 200) - 11211703762016719263800*x + 14849938757638038 \\ & 760000) - 77559535824075985054656248*\sqrt{2}*(2*x^2 - x + 3) - 10 \\ & 9685805646766692932212800*x + 329057416940300078796638400)/(52502 \\ & 434123859361583*\sqrt{2}*x^2 - 74249693788190193800*x^2))*\sqrt{(23 \\ & 43727*\sqrt{2} - 3357400)/(7868829029800*\sqrt{2} - 11129123630529) \\ &) + 16787*930248^{(1/4)}*\sqrt{33574}*\sqrt{31}*(2343727*\sqrt{2}*(19* \\ & x - 22) - 63790600*x + 73862800)*\sqrt{(2343727*\sqrt{2} - 3357400) \\ & /(7868829029800*\sqrt{2} - 11129123630529)} - 45794936*\sqrt{16787} \\ & *\sqrt{31}*\sqrt{2*x^2 - x + 3}*(332*\sqrt{2} - 537)) + 8422204*\sqrt{ \\ & 16787}*\sqrt{2}*(5*x^2 + 3*x + 2)*\arctan(-520397*(930248^{(1/4)}*s \\ & \sqrt{33574}*(2343727*\sqrt{2}*(x - 6) - 3357400*x + 20144400)*\sqrt{ \\ & (2343727*\sqrt{2} - 3357400)/(7868829029800*\sqrt{2} - 111291236305 \\ & 29)} - 88*\sqrt{16787}*\sqrt{2*x^2 - x + 3}*(1816*\sqrt{2} - 2119))/ \\ & (2*930248^{(1/4)}*\sqrt{33574}*\sqrt{16787}*\sqrt{31}*(2343727*\sqrt{2} \\ & *x - 3357400*x)*\sqrt{(\sqrt{2}*(930248^{(1/4)}*\sqrt{33574}*\sqrt{16787} \\ &)*\sqrt{2*x^2 - x + 3}*(\sqrt{2}*(189489825488457357396643*x + 7848 \\ & 9272699663150388575) - 267979098188120507785218*x - 1110005527887 \\ & 94207008068)*\sqrt{(2343727*\sqrt{2} - 3357400)/(7868829029800*\sqrt{ \\ & 2} - 11129123630529)} - 219371611293533385864425600*x^2 - 16787* \\ & \sqrt{2}*(3638234995621319496200*x^2 - 52502434123859361583*\sqrt{2} \\ &)*(49*x^2 - 151*x + 200) - 11211703762016719263800*x + 1484993875 \\ & 7638038760000) + 77559535824075985054656248*\sqrt{2}*(2*x^2 - x + \\ & 3) + 109685805646766692932212800*x - 329057416940300078796638400 \\ & /(52502434123859361583*\sqrt{2}*x^2 - 74249693788190193800*x^2))*s \\ & \sqrt{(2343727*\sqrt{2} - 3357400)/(7868829029800*\sqrt{2} - 11129123 \end{aligned}$$

630529)) + 16787*930248^(1/4)*sqrt(33574)*sqrt(31)*(2343727*sqrt(2)*(19*x - 22) - 63790600*x + 73862800)*sqrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)) + 45794936*sqrt(16787)*sqrt(31)*sqrt(2*x^2 - x + 3)*(332*sqrt(2) - 537)) - sqrt(16787)*sqrt(31)*(16787000*x^2 - 2343727*sqrt(2)*(5*x^2 + 3*x + 2) + 10072200*x + 6714800)*log(-41967500*sqrt(2)*(930248^(1/4)*sqrt(33574)*sqrt(16787)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(189489825488457357396643*x + 78489272699663150388575) - 267979098188120507785218*x - 111000552788794207008068)*sqrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)) + 219371611293533385864425600*x^2 + 16787*sqrt(2)*(3638234995621319496200*x^2 - 52502434123859361583*sqrt(2)*(49*x^2 - 151*x + 200) - 11211703762016719263800*x + 14849938757638038760000) - 77559535824075985054656248*sqrt(2)*(2*x^2 - x + 3) - 109685805646766692932212800*x + 329057416940300078796638400)/(52502434123859361583*sqrt(2)*x^2 - 74249693788190193800*x^2)) + sqrt(16787)*sqrt(31)*(16787000*x^2 - 2343727*sqrt(2)*(5*x^2 + 3*x + 2) + 10072200*x + 6714800)*log(41967500*sqrt(2)*(930248^(1/4)*sqrt(33574)*sqrt(16787)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(189489825488457357396643*x + 78489272699663150388575) - 267979098188120507785218*x - 111000552788794207008068)*sqrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)) - 219371611293533385864425600*x^2 - 16787*sqrt(2)*(3638234995621319496200*x^2 - 52502434123859361583*sqrt(2)*(49*x^2 - 151*x + 200) - 11211703762016719263800*x + 14849938757638038760000) + 77559535824075985054656248*sqrt(2)*(2*x^2 - x + 3) + 109685805646766692932212800*x - 329057416940300078796638400)/(52502434123859361583*sqrt(2)*x^2 - 74249693788190193800*x^2)))/((16787000*x^2 - 2343727*sqrt(2)*(5*x^2 + 3*x + 2) + 10072200*x + 6714800)*sqrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)))

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

$$\int \frac{1}{\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2), x)

[Out] Integral(1/(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.85 \quad \int \frac{1}{\sqrt{3-x+2x^2}(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=223

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{1364(5x^2+3x+2)^2} + \frac{(86265x+26794)\sqrt{2x^2-x+3}}{1860496(5x^2+3x+2)}$$

$$+ \frac{25\sqrt{\frac{1}{682}(6414867847+4536374600\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(6414867847+4536374600\sqrt{2})}}((294669+208915\sqrt{2})x+85754\sqrt{2}+123161)}}{\sqrt{2x^2-x+3}}\right)}{3720992}$$

$$- \frac{25\sqrt{\frac{1}{682}(4536374600\sqrt{2}-6414867847)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(4536374600\sqrt{2}-6414867847)}}((294669-208915\sqrt{2})x-85754\sqrt{2}+123161)}}{\sqrt{2x^2-x+3}}\right)}{3720992}$$

[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(1364*(2 + 3*x + 5*x^2)^2) + ((26794 + 86265*x)*Sqrt[3 - x + 2*x^2])/(1860496*(2 + 3*x + 5*x^2)) + (25*Sqrt[(6414867847 + 4536374600*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(6414867847 + 4536374600*Sqrt[2]))])*(123161 + 85754*Sqrt[2] + (294669 + 208915*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]])/3720992 - (25*Sqrt[(-6414867847 + 4536374600*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-6414867847 + 4536374600*Sqrt[2]))])*(123161 - 85754*Sqrt[2] + (294669 - 208915*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2]])/3720992

Rubi [A] time = 0.968858, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{1364(5x^2+3x+2)^2} + \frac{(86265x+26794)\sqrt{2x^2-x+3}}{1860496(5x^2+3x+2)}$$

$$+ \frac{25\sqrt{\frac{1}{682}(6414867847+4536374600\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(6414867847+4536374600\sqrt{2})}}((294669+208915\sqrt{2})x+85754\sqrt{2}+123161)}}{\sqrt{2x^2-x+3}}\right)}{3720992}$$

$$- \frac{25\sqrt{\frac{1}{682}(4536374600\sqrt{2}-6414867847)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(4536374600\sqrt{2}-6414867847)}}((294669-208915\sqrt{2})x-85754\sqrt{2}+123161)}}{\sqrt{2x^2-x+3}}\right)}{3720992}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3), x]

[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(1364*(2 + 3*x + 5*x^2)^2) + ((26794 + 86265*x)*Sqrt[3 - x + 2*x^2])/(1860496*(2 + 3*x + 5*x^2))

$$\begin{aligned}
& + (25*\text{Sqrt}[(6414867847 + 4536374600*\text{Sqrt}[2])/682]*\text{ArcTan}[(\text{Sqrt}[11 \\
& / (31*(6414867847 + 4536374600*\text{Sqrt}[2]))]*(123161 + 85754*\text{Sqrt}[2] \\
& + (294669 + 208915*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/3720992 - (\\
& 25*\text{Sqrt}[(-6414867847 + 4536374600*\text{Sqrt}[2])/682]*\text{ArcTanh}[(\text{Sqrt}[11/ \\
& (31*(-6414867847 + 4536374600*\text{Sqrt}[2]))]*(123161 - 85754*\text{Sqrt}[2] \\
& + (294669 - 208915*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/3720992
\end{aligned}$$

Rubi in Sympy [A] time = 104.21, size = 258, normalized size = 1.16

$$\begin{aligned}
& \frac{(715x + 44)\sqrt{2x^2 - x + 3}}{15004(5x^2 + 3x + 2)^2} + \frac{(\frac{10438065x}{2} + 1621037)\sqrt{2x^2 - x + 3}}{112560008(5x^2 + 3x + 2)} \\
& + \frac{\sqrt{682}\left(\frac{868577325}{2} + 310422475\sqrt{2}\right)\left(\frac{1426732175\sqrt{2}}{2} + \frac{4098182275}{4}\right)\text{atan}\left(\frac{4\sqrt{341}\left(x\left(\frac{9805110975}{4} + \frac{6951646625\sqrt{2}}{4}\right) + \frac{1426732175\sqrt{2}}{2} + \frac{4098182275}{4}\right)}{1031525\sqrt{6414867847+4536374600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{14049123932516200\sqrt{6414867847 + 4536374600\sqrt{2}}} \\
& + \frac{\sqrt{682}\left(-\frac{1426732175\sqrt{2}}{2} + \frac{4098182275}{4}\right)\left(-310422475\sqrt{2} + \frac{868577325}{2}\right)\text{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{6951646625\sqrt{2}}{4} + \frac{9805110975}{4}\right) - \frac{1426732175\sqrt{2}}{2} + \frac{4098182275}{4}\right)}{1031525\sqrt{-6414867847+4536374600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{14049123932516200\sqrt{-6414867847 + 4536374600\sqrt{2}}}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)`

[Out] `(715*x + 44)*sqrt(2*x**2 - x + 3)/(15004*(5*x**2 + 3*x + 2)**2) + (10438065*x/2 + 1621037)*sqrt(2*x**2 - x + 3)/(112560008*(5*x**2 + 3*x + 2)) + sqrt(682)*(868577325/2 + 310422475*sqrt(2))*(1426732175*sqrt(2)/2 + 4098182275/4)*atan(4*sqrt(341)*(x*(9805110975/4 + 6951646625*sqrt(2)/4) + 1426732175*sqrt(2)/2 + 4098182275/4)/(1031525*sqrt(6414867847 + 4536374600*sqrt(2))*sqrt(2*x**2 - x + 3)))/(14049123932516200*sqrt(6414867847 + 4536374600*sqrt(2))) + sqrt(682)*(-1426732175*sqrt(2)/2 + 4098182275/4)*(-310422475*sqrt(2) + 868577325/2)*atanh(4*sqrt(341)*(x*(-6951646625*sqrt(2)/4 + 9805110975/4) - 1426732175*sqrt(2)/2 + 4098182275/4)/(1031525*sqrt(-6414867847 + 4536374600*sqrt(2))*sqrt(2*x**2 - x + 3)))/(14049123932516200*sqrt(-6414867847 + 4536374600*sqrt(2)))`

Mathematica [C] time = 6.46702, size = 1170, normalized size = 5.25

$$\sqrt{2x^2 - x + 3} \left(\frac{65x + 4}{1364(5x^2 + 3x + 2)^2} + \frac{86265x + 26794}{1860496(5x^2 + 3x + 2)} \right)$$

$$125i(-41783i + 1489\sqrt{31}) \tan^{-1} \left(\frac{31(97553324\sqrt{31}x^4 - 72669503461i\sqrt{31}x^4 + 84861105868x^4 + 3629099680i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 - 29645645200i\sqrt{31}x^3 + 23724095940i\sqrt{31}x^2 - 1411781250i\sqrt{31}x + 3720992)}{-72669503461i\sqrt{31}x^4 + 84861105868x^4 + 3629099680i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 - 29645645200i\sqrt{31}x^3 - 23724095940i\sqrt{31}x^2 + 1411781250i\sqrt{31}x + 3720992} \right)$$

$$125i(41783i + 1489\sqrt{31}) \tanh^{-1} \left(\frac{72669503461\sqrt{31}x^4 - 84861105868ix^4 + 19960048240\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 29645645200\sqrt{31}x^3 - 23724095940\sqrt{31}x^2 + 1411781250\sqrt{31}x + 3720992}{3024153044\sqrt{31}x^4 + 3439410\sqrt{31}x^3 + 11709236\sqrt{31}x^2 + 1411781250\sqrt{31}x + 3720992} \right)$$

$$125i(41783i + 1489\sqrt{31}) \log \left(\frac{(-10ix + \sqrt{31} - 3i)^2 (10ix + \sqrt{31} + 3i)^2}{7441984\sqrt{682(-13+i\sqrt{31})}} \right)$$

$$+ \frac{125(-41783i + 1489\sqrt{31}) \log \left(\frac{(-10ix + \sqrt{31} - 3i)^2 (10ix + \sqrt{31} + 3i)^2}{7441984\sqrt{682(13+i\sqrt{31})}} \right)}{7441984\sqrt{682(13+i\sqrt{31})}}$$

$$125i(41783i + 1489\sqrt{31}) \log \left(\frac{(5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 46 \right)}{7441984\sqrt{682(-13+i\sqrt{31})}} \right)$$

$$125(-41783i + 1489\sqrt{31}) \log \left(\frac{(5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 104 \right)}{7441984\sqrt{682(13+i\sqrt{31})}} \right)$$

$$+ \frac{125(-41783i + 1489\sqrt{31}) \log \left(\frac{(5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 104 \right)}{7441984\sqrt{682(13+i\sqrt{31})}} \right)}{7441984\sqrt{682(13+i\sqrt{31})}}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3), x]

[Out] Sqrt[3 - x + 2*x^2]*((4 + 65*x)/(1364*(2 + 3*x + 5*x^2)^2) + (26794 + 86265*x)/(1860496*(2 + 3*x + 5*x^2))) - (((125*I)/3720992)*(-41783*I + 1489*Sqrt[31])*ArcTan[(31*(1733669734*I + 1411781250*Sqrt[31] - (8257920150*I)*x + 438440750*Sqrt[31]*x + (8927431079*I)*x^2 + 784505986*Sqrt[31]*x^2 - (8456927744*I)*x^3 + 557246338*Sqrt[31]*x^3 + (3245899757*I)*x^4 + 97553324*Sqrt[31]*x^4))/(74935517250 + (14089391258*I)*Sqrt[31] + 394528763486*x - (31523713098*I)*Sqrt[31]*x + 37412913890*x^2 - (81049798431*I)*Sqrt[31]*x^2 + 237240959890*x^3 - (29645645200*I)*Sqrt[31]*x^3 + 84861105868*x^4 - (72669503461*I)*Sqrt[31]*x^4 - (362909968*I)*Sqrt[682*(13 + I

```

*Sqrt[31]))*Sqrt[3 - x + 2*x^2] + (907274920*I)*Sqrt[682*(13 + I*
Sqrt[31]))*x*Sqrt[3 - x + 2*x^2] + (1270184888*I)*Sqrt[682*(13 +
I*Sqrt[31]))*x^2*Sqrt[3 - x + 2*x^2] + (3629099680*I)*Sqrt[682*(1
3 + I*Sqrt[31]))*x^3*Sqrt[3 - x + 2*x^2]])/Sqrt[682*(13 + I*Sqrt
[31))] - (((125*I)/3720992)*(41783*I + 1489*Sqrt[31])*ArcTanh[(-7
4935517250*I - 14089391258*Sqrt[31] - (394528763486*I)*x + 315237
13098*Sqrt[31]*x - (37412913890*I)*x^2 + 81049798431*Sqrt[31]*x^2
- (237240959890*I)*x^3 + 29645645200*Sqrt[31]*x^3 - (84861105868
*I)*x^4 + 72669503461*Sqrt[31]*x^4 - 22863327984*Sqrt[22*(-13 + I
*Sqrt[31]))*Sqrt[3 - x + 2*x^2] - 26310972680*Sqrt[22*(-13 + I*Sqr
t[31]))*x*Sqrt[3 - x + 2*x^2] - 45182291016*Sqrt[22*(-13 + I*Sqr
t[31]))*x^2*Sqrt[3 - x + 2*x^2] + 19960048240*Sqrt[22*(-13 + I*Sqr
t[31]))*x^3*Sqrt[3 - x + 2*x^2]]/(672076174246*I + 43765218750*S
qrt[31] + (796731376970*I)*x + 13591663250*Sqrt[31]*x + (89363428
3351*I)*x^2 + 24319685566*Sqrt[31]*x^2 - (841081542656*I)*x^3 + 1
7274636478*Sqrt[31]*x^3 + (343941818333*I)*x^4 + 3024153044*Sqrt[
31]*x^4)]/Sqrt[682*(-13 + I*Sqrt[31))] - (125*(-41783*I + 1489*S
qrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10
*I)*x)^2])/(7441984*Sqrt[682*(13 + I*Sqrt[31))]) + (((125*I)/7441
984)*(41783*I + 1489*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2
*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[31))] - (
((125*I)/7441984)*(41783*I + 1489*Sqrt[31])*Log[(2 + 3*x + 5*x^2)
*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2
+ 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31))]*Sqrt[3 - x + 2
*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31))]*x*Sqrt[3 - x + 2*x^2)]
]/Sqrt[682*(-13 + I*Sqrt[31))] + (125*(-41783*I + 1489*Sqrt[31))
*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*S
qrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 +
I*Sqrt[31))]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31
])] *x*Sqrt[3 - x + 2*x^2]])/(7441984*Sqrt[682*(13 + I*Sqrt[31))
)

```

Maple [B] time = 0.037, size = 13040, normalized size = 58.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(5*x^2+3*x+2)^3/(2*x^2-x+3)^(1/2), x)

[Out] result too large to display

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

$$\int \frac{1}{(5x^2 + 3x + 2)^3 \sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)), x)
```

Fricas [A] time = 0.37231, size = 1601, normalized size = 7.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] 1/2433873989840816267008*sqrt(22681873)*232562^(3/4)*sqrt(31)*(8*
sqrt(22681873)*232562^(1/4)*sqrt(31)*(3913303548690000*x^3 + 3563
458339538000*x^2 - 6414867847*sqrt(2)*(431325*x^3 + 392765*x^2 +
341572*x + 59044) + 3098997089742400*x + 535691403764800)*sqrt(2*
x^2 - x + 3)*sqrt((6414867847*sqrt(2) - 9072749200)/(582004871269
74972400*sqrt(2) - 82307918517524735409)) + 46113488900*sqrt(2268
1873)*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(31*(sq
rt(22681873)*232562^(1/4)*(6414867847*sqrt(2)*(x - 6) - 907274920
0*x + 54436495200)*sqrt((6414867847*sqrt(2) - 9072749200)/(582004
87126974972400*sqrt(2) - 82307918517524735409)) + 44*sqrt(2268187
3)*sqrt(2*x^2 - x + 3)*(85754*sqrt(2) - 123161))/(2*sqrt(22681873
)*232562^(1/4)*sqrt(31)*(6414867847*sqrt(2)*x - 9072749200*x)*sq
rt(-sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(19876203
1129681560785565546777639977*x + 82329928978737020071375607715487
825) - 281091960108418580856941154493127802*x - 11643210215094454
0714189939062152152)*sqrt((6414867847*sqrt(2) - 9072749200)/(5820
0487126974972400*sqrt(2) - 82307918517524735409)) + 2628482505413
02983534060383238400*x^2 + sqrt(2)*(73179342480249126097550902151
600*x^2 - 1056032843072437810464498574423*sqrt(2)*(49*x^2 - 151*x
+ 200) - 225511851316686082463881351528400*x + 29869119379693520
8561432253680000) - 92930890190374527320875874549224*sqrt(2)*(2*x
^2 - x + 3) - 131424125270651491767030191619200*x + 3942723758119
54475301090574857600)/(1056032843072437810464498574423*sqrt(2)*x^
2 - 1493455968984676042807161268400*x^2))*sqrt((6414867847*sqrt(2
) - 9072749200)/(58200487126974972400*sqrt(2) - 82307918517524735
409)) + sqrt(22681873)*232562^(1/4)*sqrt(31)*(6414867847*sqrt(2)*
(19*x - 22) - 172382234800*x + 199600482400)*sqrt((6414867847*sq
rt(2) - 9072749200)/(58200487126974972400*sqrt(2) - 82307918517524
735409)) - 1364*sqrt(22681873)*sqrt(31)*sqrt(2*x^2 - x + 3)*(1865
8*sqrt(2) - 26103)) + 46113488900*sqrt(22681873)*sqrt(2)*(25*x^4
+ 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-31*(sqrt(22681873)*232562^
(1/4)*(6414867847*sqrt(2)*(x - 6) - 9072749200*x + 54436495200)*s
qrt((6414867847*sqrt(2) - 9072749200)/(58200487126974972400*sqrt(
2) - 82307918517524735409)) - 44*sqrt(22681873)*sqrt(2*x^2 - x +
3)*(85754*sqrt(2) - 123161))/(2*sqrt(22681873)*232562^(1/4)*sqrt(
```

$$\begin{aligned}
& 31) * (6414867847 * \sqrt{2} * x - 9072749200 * x) * \sqrt{(\sqrt{2} * (2 * 232562^{1/4} * \sqrt{2 * x^2 - x + 3} * (\sqrt{2} * (19876203112968156078556554677 \\
& 7639977 * x + 82329928978737020071375607715487825) - 28109196010841 \\
& 8580856941154493127802 * x - 116432102150944540714189939062152152) * \\
& \sqrt{((6414867847 * \sqrt{2} - 9072749200) / (58200487126974972400 * \sqrt{2} \\
& (2) - 82307918517524735409)) - 262848250541302983534060383238400 * \\
& x^2 - \sqrt{2} * (73179342480249126097550902151600 * x^2 - 10560328430 \\
& 72437810464498574423 * \sqrt{2} * (49 * x^2 - 151 * x + 200) - 22551185131 \\
& 6686082463881351528400 * x + 298691193796935208561432253680000) + 9 \\
& 2930890190374527320875874549224 * \sqrt{2} * (2 * x^2 - x + 3) + 1314241 \\
& 25270651491767030191619200 * x - 394272375811954475301090574857600) \\
& / ((1056032843072437810464498574423 * \sqrt{2} * x^2 - 14934559689846760 \\
& 42807161268400 * x^2)) * \sqrt{((6414867847 * \sqrt{2} - 9072749200) / (5820 \\
& 0487126974972400 * \sqrt{2} - 82307918517524735409)) + \sqrt{22681873} \\
&) * 232562^{1/4} * \sqrt{31} * (6414867847 * \sqrt{2} * (19 * x - 22) - 1723822 \\
& 34800 * x + 199600482400) * \sqrt{((6414867847 * \sqrt{2} - 9072749200) / (5 \\
& 8200487126974972400 * \sqrt{2} - 82307918517524735409)) + 1364 * \sqrt{22681873} \\
&) * \sqrt{31} * \sqrt{2 * x^2 - x + 3} * (18658 * \sqrt{2} - 26103))) \\
& + 25 * \sqrt{22681873} * \sqrt{31} * (226818730000 * x^4 + 272182476000 * x^3 \\
& + 263109726800 * x^2 - 6414867847 * \sqrt{2} * (25 * x^4 + 30 * x^3 + 29 * x^2 \\
& + 12 * x + 4) + 108872990400 * x + 36290996800) * \log(-80385525435645 \\
& 1562500 * \sqrt{2} * (2 * 232562^{1/4} * \sqrt{2 * x^2 - x + 3} * (\sqrt{2} * (198 \\
& 762031129681560785565546777639977 * x + 823299289787370200713756077 \\
& 15487825) - 281091960108418580856941154493127802 * x - 116432102150 \\
& 944540714189939062152152) * \sqrt{((6414867847 * \sqrt{2} - 9072749200) / \\
& (58200487126974972400 * \sqrt{2} - 82307918517524735409)) + 26284825 \\
& 0541302983534060383238400 * x^2 + \sqrt{2} * (731793424802491260975509 \\
& 02151600 * x^2 - 1056032843072437810464498574423 * \sqrt{2} * (49 * x^2 - \\
& 151 * x + 200) - 225511851316686082463881351528400 * x + 298691193796 \\
& 935208561432253680000) - 92930890190374527320875874549224 * \sqrt{2} \\
& * (2 * x^2 - x + 3) - 131424125270651491767030191619200 * x + 39427237 \\
& 5811954475301090574857600) / (1056032843072437810464498574423 * \sqrt{2} \\
& * x^2 - 1493455968984676042807161268400 * x^2)) - 25 * \sqrt{22681873} \\
&) * \sqrt{31} * (226818730000 * x^4 + 272182476000 * x^3 + 263109726800 * x^2 \\
& - 6414867847 * \sqrt{2} * (25 * x^4 + 30 * x^3 + 29 * x^2 + 12 * x + 4) + 10 \\
& 8872990400 * x + 36290996800) * \log(803855254356451562500 * \sqrt{2} * (2 * \\
& 232562^{1/4} * \sqrt{2 * x^2 - x + 3} * (\sqrt{2} * (1987620311296815607855 \\
& 65546777639977 * x + 82329928978737020071375607715487825) - 2810919 \\
& 60108418580856941154493127802 * x - 1164321021509445407141899390621 \\
& 52152) * \sqrt{((6414867847 * \sqrt{2} - 9072749200) / (582004871269749724 \\
& 00 * \sqrt{2} - 82307918517524735409)) - 262848250541302983534060383 \\
& 238400 * x^2 - \sqrt{2} * (73179342480249126097550902151600 * x^2 - 1056 \\
& 032843072437810464498574423 * \sqrt{2} * (49 * x^2 - 151 * x + 200) - 2255 \\
& 11851316686082463881351528400 * x + 2986911937969352085614322536800 \\
& 00) + 92930890190374527320875874549224 * \sqrt{2} * (2 * x^2 - x + 3) + \\
& 131424125270651491767030191619200 * x - 394272375811954475301090574 \\
& 857600) / (1056032843072437810464498574423 * \sqrt{2} * x^2 - 1493455968 \\
& 984676042807161268400 * x^2)) / ((226818730000 * x^4 + 272182476000 * x^3 \\
& + 263109726800 * x^2 - 6414867847 * \sqrt{2} * (25 * x^4 + 30 * x^3 + 29 * x^2 \\
& + 12 * x + 4) + 108872990400 * x + 36290996800) * \sqrt{((6414867847 * \sqrt{2} \\
& - 9072749200) / (58200487126974972400 * \sqrt{2} - 823079185175 \\
& 24735409)))
\end{aligned}$$

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

$$\int \frac{1}{\sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)`

[Out] `Integral(1/(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3), x)`

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)),x, algorithm="giac")`

[Out] Exception raised: RuntimeError

$$3.86 \quad \int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^{3/2}} dx$$

Optimal. Leaf size=166

$$\begin{aligned} & -\frac{111315\sqrt{2x^2-x+3x^2}}{2048} - \frac{8992487\sqrt{2x^2-x+3x}}{16384} - \frac{31009685\sqrt{2x^2-x+3}}{65536} - \frac{14641(79x+101)}{1472\sqrt{2x^2-x+3}} \\ & + \frac{625}{24}\sqrt{2x^2-x+3x^5} + \frac{10075}{96}\sqrt{2x^2-x+3x^4} + \frac{79425}{512}\sqrt{2x^2-x+3x^3} - \frac{310445587 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{131072\sqrt{2}} \end{aligned}$$

[Out] (-14641*(101 + 79*x))/(1472*sqrt[3 - x + 2*x^2]) - (31009685*sqrt[3 - x + 2*x^2])/65536 - (8992487*x*sqrt[3 - x + 2*x^2])/16384 - (111315*x^2*sqrt[3 - x + 2*x^2])/2048 + (79425*x^3*sqrt[3 - x + 2*x^2])/512 + (10075*x^4*sqrt[3 - x + 2*x^2])/96 + (625*x^5*sqrt[3 - x + 2*x^2])/24 - (310445587*ArcSinh[(1 - 4*x)/sqrt[23]])/(131072*sqrt[2])

Rubi [A] time = 0.335245, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & -\frac{111315\sqrt{2x^2-x+3x^2}}{2048} - \frac{8992487\sqrt{2x^2-x+3x}}{16384} - \frac{31009685\sqrt{2x^2-x+3}}{65536} - \frac{14641(79x+101)}{1472\sqrt{2x^2-x+3}} \\ & + \frac{625}{24}\sqrt{2x^2-x+3x^5} + \frac{10075}{96}\sqrt{2x^2-x+3x^4} + \frac{79425}{512}\sqrt{2x^2-x+3x^3} - \frac{310445587 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{131072\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(3/2), x]

[Out] (-14641*(101 + 79*x))/(1472*sqrt[3 - x + 2*x^2]) - (31009685*sqrt[3 - x + 2*x^2])/65536 - (8992487*x*sqrt[3 - x + 2*x^2])/16384 - (111315*x^2*sqrt[3 - x + 2*x^2])/2048 + (79425*x^3*sqrt[3 - x + 2*x^2])/512 + (10075*x^4*sqrt[3 - x + 2*x^2])/96 + (625*x^5*sqrt[3 - x + 2*x^2])/24 - (310445587*ArcSinh[(1 - 4*x)/sqrt[23]])/(131072*sqrt[2])

Rubi in Sympy [A] time = 97.0207, size = 175, normalized size = 1.05

$$\begin{aligned}
 & - \frac{2(-4x+1)(5x^2+3x+2)^4}{23\sqrt{2x^2-x+3}} - \frac{(11200x+9520)\sqrt{2x^2-x+3}(5x^2+3x+2)^3}{12880} \\
 & + \frac{(35770000x+99473500)\sqrt{2x^2-x+3}(5x^2+3x+2)^2}{7728000} \\
 & - \frac{(56221252500x+33377245125)(-1874041750x^2+4439548750x+1495749500)\sqrt{2x^2-x+3}}{695164542912000000} \\
 & - \frac{(4040855648915524031250x + \frac{8690385309739832671875}{2})\sqrt{2x^2-x+3}}{5561316343296000000} \\
 & + \frac{310445587\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{262144}
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(3/2),x)`

[Out] $-2*(-4*x + 1)*(5*x**2 + 3*x + 2)**4/(23*\sqrt{2*x**2 - x + 3}) - (11200*x + 9520)*\sqrt{2*x**2 - x + 3}*(5*x**2 + 3*x + 2)**3/12880 + (35770000*x + 99473500)*\sqrt{2*x**2 - x + 3}*(5*x**2 + 3*x + 2)**2/7728000 - (56221252500*x + 33377245125)*(-1874041750*x**2 + 4439548750*x + 1495749500)*\sqrt{2*x**2 - x + 3}/695164542912000000 - (4040855648915524031250*x + 8690385309739832671875/2)*\sqrt{2*x**2 - x + 3}/5561316343296000000 + 310445587*\sqrt{2}*\operatorname{atanh}(\sqrt{2}*(4*x - 1)/(4*\sqrt{2*x**2 - x + 3}))/262144$

Mathematica [A] time = 0.0946359, size = 95, normalized size = 0.57

$$\begin{aligned}
 & \sqrt{2x^2-x+3} \left(\frac{625x^5}{24} + \frac{10075x^4}{96} + \frac{79425x^3}{512} - \frac{111315x^2}{2048} - \frac{14641(79x+101)}{1472(2x^2-x+3)} - \frac{8992487x}{16384} - \frac{31009685}{65536} \right) \\
 & + \frac{310445587 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{131072\sqrt{2}}
 \end{aligned}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(3/2),x]`

[Out] $\operatorname{Sqrt}[3 - x + 2*x^2]*(-31009685/65536 - (8992487*x)/16384 - (111315*x^2)/2048 + (79425*x^3)/512 + (10075*x^4)/96 + (625*x^5)/24 - (14641*(101 + 79*x))/(1472*(3 - x + 2*x^2))) + (310445587*\operatorname{ArcSinh}[(-1 + 4*x)/\operatorname{Sqrt}[23]])/(131072*\operatorname{Sqrt}[2])$

Maple [A] time = 0.036, size = 166, normalized size = 1.

$$\begin{aligned} & \frac{4936178060x - 1234044515}{12058624} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{1217267299}{524288} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & - \frac{310445587x}{131072} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{310445587\sqrt{2}}{262144} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) \\ & - \frac{18367831x^2}{32768} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{4734827x^3}{8192} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{52235x^4}{1024} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & + \frac{217675x^5}{768} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{8825x^6}{48} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{625x^7}{12} \frac{1}{\sqrt{2x^2 - x + 3}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4/(2*x^2-x+3)^(3/2),x)`

[Out] $1234044515/12058624*(4*x-1)/(2*x^2-x+3)^{(1/2)} - 1217267299/524288/(2*x^2-x+3)^{(1/2)} - 310445587/131072*x/(2*x^2-x+3)^{(1/2)} + 310445587/262144*2^{(1/2)}*\operatorname{arcsinh}(4/23*23^{(1/2)}*(x-1/4)) - 18367831/32768*x^2/(2*x^2-x+3)^{(1/2)} - 4734827/8192*x^3/(2*x^2-x+3)^{(1/2)} + 52235/1024*x^4/(2*x^2-x+3)^{(1/2)} + 217675/768*x^5/(2*x^2-x+3)^{(1/2)} + 8825/48*x^6/(2*x^2-x+3)^{(1/2)} + 625/12*x^7/(2*x^2-x+3)^{(1/2)}$

Maxima [A] time = 0.781994, size = 200, normalized size = 1.2

$$\begin{aligned} & \frac{625x^7}{12\sqrt{2x^2 - x + 3}} + \frac{8825x^6}{48\sqrt{2x^2 - x + 3}} + \frac{217675x^5}{768\sqrt{2x^2 - x + 3}} \\ & + \frac{52235x^4}{1024\sqrt{2x^2 - x + 3}} - \frac{4734827x^3}{8192\sqrt{2x^2 - x + 3}} - \frac{18367831x^2}{32768\sqrt{2x^2 - x + 3}} \\ & + \frac{310445587}{262144} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) - \frac{2953101993x}{1507328\sqrt{2x^2 - x + 3}} - \frac{3653899049}{1507328\sqrt{2x^2 - x + 3}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")`

[Out] $625/12*x^7/\sqrt{2*x^2 - x + 3} + 8825/48*x^6/\sqrt{2*x^2 - x + 3} + 217675/768*x^5/\sqrt{2*x^2 - x + 3} + 52235/1024*x^4/\sqrt{2*x^2 - x + 3} - 4734827/8192*x^3/\sqrt{2*x^2 - x + 3} - 18367831/32768*x^2/\sqrt{2*x^2 - x + 3} + 310445587/262144*\sqrt{2}*\operatorname{arsinh}(1/23*\sqrt{23}*(4*x - 1)) - 2953101993/1507328*x/\sqrt{2*x^2 - x + 3} - 3653899049/1507328/\sqrt{2*x^2 - x + 3}$

Fricas [A] time = 0.290256, size = 159, normalized size = 0.96

$$\sqrt{2} \left(4 \sqrt{2} (235520000 x^7 + 831385600 x^6 + 1281670400 x^5 + 230669760 x^4 - 2613624504 x^3 - 2534760678 x^2 - 8859305979 x - 10961697147) \sqrt{2x^2 - x + 3} + 21420745503 (2x^2 - x + 3) \log(-\sqrt{2} (32x^2 - 16x + 25) - 8\sqrt{2x^2 - x + 3} (4x - 1)) \right) / (2x^2 - x + 3)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")

[Out] 1/36175872*sqrt(2)*(4*sqrt(2)*(235520000*x^7 + 831385600*x^6 + 1281670400*x^5 + 230669760*x^4 - 2613624504*x^3 - 2534760678*x^2 - 8859305979*x - 10961697147)*sqrt(2*x^2 - x + 3) + 21420745503*(2*x^2 - x + 3)*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(2*x^2 - x + 3)

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

$$\int \frac{(5x^2 + 3x + 2)^4}{(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(3/2),x)

[Out] Integral((5*x**2 + 3*x + 2)**4/(2*x**2 - x + 3)**(3/2), x)

GIAC/XCAS [A] time = 0.273171, size = 111, normalized size = 0.67

$$-\frac{310445587}{262144} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right) + \frac{(46(4(40(20(16(100x + 353)x + 8707)x + 31341)x - 14204481)x - 55103493)x - 8859305979)x - 10961697147}{4521984 \sqrt{2x^2 - x + 3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")

[Out] -310445587/262144*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1) + 1/4521984*((46*(4*(40*(20*(16*(100*x + 353)*x + 8

$$\frac{707x^5 + 31341x^4 - 14204481x^3 - 55103493x^2 - 8859305979x - 10961697147}{\sqrt{2x^2 - x + 3}}$$

$$3.87 \quad \int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^{3/2}} dx$$

Optimal. Leaf size=124

$$\begin{aligned} & \frac{1825}{64} \sqrt{2x^2 - x + 3} x^2 + \frac{15565}{512} \sqrt{2x^2 - x + 3} x - \frac{181561 \sqrt{2x^2 - x + 3}}{2048} \\ & - \frac{1331(17 - 45x)}{368 \sqrt{2x^2 - x + 3}} + \frac{125}{16} \sqrt{2x^2 - x + 3} x^3 + \frac{1168881 \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right)}{4096 \sqrt{2}} \end{aligned}$$

[Out] $(-1331*(17 - 45*x))/(368*\text{Sqrt}[3 - x + 2*x^2]) - (181561*\text{Sqrt}[3 - x + 2*x^2])/2048 + (15565*x*\text{Sqrt}[3 - x + 2*x^2])/512 + (1825*x^2*\text{Sqrt}[3 - x + 2*x^2])/64 + (125*x^3*\text{Sqrt}[3 - x + 2*x^2])/16 + (1168881*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(4096*\text{Sqrt}[2])$

Rubi [A] time = 0.217738, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{1825}{64} \sqrt{2x^2 - x + 3} x^2 + \frac{15565}{512} \sqrt{2x^2 - x + 3} x - \frac{181561 \sqrt{2x^2 - x + 3}}{2048} \\ & - \frac{1331(17 - 45x)}{368 \sqrt{2x^2 - x + 3}} + \frac{125}{16} \sqrt{2x^2 - x + 3} x^3 + \frac{1168881 \sinh^{-1} \left(\frac{1-4x}{\sqrt{23}} \right)}{4096 \sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(3/2), x]$

[Out] $(-1331*(17 - 45*x))/(368*\text{Sqrt}[3 - x + 2*x^2]) - (181561*\text{Sqrt}[3 - x + 2*x^2])/2048 + (15565*x*\text{Sqrt}[3 - x + 2*x^2])/512 + (1825*x^2*\text{Sqrt}[3 - x + 2*x^2])/64 + (125*x^3*\text{Sqrt}[3 - x + 2*x^2])/16 + (1168881*\text{ArcSinh}[(1 - 4*x)/\text{Sqrt}[23]])/(4096*\text{Sqrt}[2])$

Rubi in Sympy [A] time = 72.1264, size = 144, normalized size = 1.16

$$\begin{aligned} & - \frac{(-476859375x + \frac{7171882875}{4}) \sqrt{2x^2 - x + 3}}{13248000} - \frac{2(-4x + 1)(5x^2 + 3x + 2)^3}{23 \sqrt{2x^2 - x + 3}} \\ & - \frac{(6000x + 5100) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)^2}{6900} \\ & + \frac{(8527500x + 24325875) \sqrt{2x^2 - x + 3} (5x^2 + 3x + 2)}{1656000} - \frac{1168881 \sqrt{2} \operatorname{atanh} \left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}} \right)}{8192} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(3/2),x)`

[Out]
$$-(-476859375*x + 7171882875/4)*\sqrt{2*x**2 - x + 3}/13248000 - 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**3/(23*\sqrt{2*x**2 - x + 3}) - (6000*x + 5100)*\sqrt{2*x**2 - x + 3}*(5*x**2 + 3*x + 2)**2/6900 + (8527500*x + 24325875)*\sqrt{2*x**2 - x + 3}*(5*x**2 + 3*x + 2)/1656000 - 1168881*\sqrt{2}*\operatorname{atanh}(\sqrt{2}*(4*x - 1)/(4*\sqrt{2*x**2 - x + 3}))/8192$$

Mathematica [A] time = 0.0972838, size = 65, normalized size = 0.52

$$\frac{4(736000x^5+2318400x^4+2624760x^3-5754186x^2+16138403x-15423965)}{\sqrt{2x^2-x+3}} - 26884263\sqrt{2} \operatorname{sinh}^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)$$

188416

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(3/2),x]`

[Out]
$$\frac{(4*(-15423965 + 16138403*x - 5754186*x^2 + 2624760*x^3 + 2318400*x^4 + 736000*x^5))/\operatorname{Sqrt}[3 - x + 2*x^2] - 26884263*\operatorname{Sqrt}[2]*\operatorname{ArcSin}h[(-1 + 4*x)/\operatorname{Sqrt}[23]]}{188416}$$

Maple [A] time = 0.01, size = 132, normalized size = 1.1

$$\begin{aligned} & \frac{21570172x - 5392543}{376832} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{5130399}{16384} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{1168881x}{4096} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & - \frac{1168881\sqrt{2}}{8192} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) - \frac{125091x^2}{1024} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & + \frac{14265x^3}{256} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{1575x^4}{32} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{125x^5}{8} \frac{1}{\sqrt{2x^2 - x + 3}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^3/(2*x^2-x+3)^(3/2),x)`

[Out]
$$5392543/376832*(4*x-1)/(2*x^2-x+3)^(1/2)-5130399/16384/(2*x^2-x+3)^(1/2)+1168881/4096*x/(2*x^2-x+3)^(1/2)-1168881/8192*2^(1/2)*\operatorname{arc} \operatorname{sinh}(4/23*23^(1/2)*(x-1/4))-125091/1024*x^2/(2*x^2-x+3)^(1/2)+14265/256*x^3/(2*x^2-x+3)^(1/2)+1575/32*x^4/(2*x^2-x+3)^(1/2)+125/8*$$

$$x^5/(2x^2-x+3)^{1/2}$$

Maxima [A] time = 0.780091, size = 154, normalized size = 1.24

$$\frac{125x^5}{8\sqrt{2x^2-x+3}} + \frac{1575x^4}{32\sqrt{2x^2-x+3}} + \frac{14265x^3}{256\sqrt{2x^2-x+3}} - \frac{125091x^2}{1024\sqrt{2x^2-x+3}} - \frac{1168881}{8192}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{16138403x}{47104\sqrt{2x^2-x+3}} - \frac{15423965}{47104\sqrt{2x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")

[Out] 125/8*x^5/sqrt(2*x^2 - x + 3) + 1575/32*x^4/sqrt(2*x^2 - x + 3) + 14265/256*x^3/sqrt(2*x^2 - x + 3) - 125091/1024*x^2/sqrt(2*x^2 - x + 3) - 1168881/8192*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) + 16138403/47104*x/sqrt(2*x^2 - x + 3) - 15423965/47104/sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.285335, size = 146, normalized size = 1.18

$$\frac{\sqrt{2}\left(4\sqrt{2}(736000x^5 + 2318400x^4 + 2624760x^3 - 5754186x^2 + 16138403x - 15423965)\sqrt{2x^2-x+3} + 26884263(2x^2-x+3)\right)}{376832(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")

[Out] 1/376832*sqrt(2)*(4*sqrt(2)*(736000*x^5 + 2318400*x^4 + 2624760*x^3 - 5754186*x^2 + 16138403*x - 15423965)*sqrt(2*x^2 - x + 3) + 26884263*(2*x^2 - x + 3)*log(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(2*x^2 - x + 3)

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

$$\int \frac{(5x^2 + 3x + 2)^3}{(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(3/2),x)

[Out] Integral((5*x**2 + 3*x + 2)**3/(2*x**2 - x + 3)**(3/2), x)

GIAC/XCAS [A] time = 0.272944, size = 97, normalized size = 0.78

$$\frac{1168881}{8192} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right) + \frac{(46(20(40(20x + 63)x + 2853)x - 125091)x + 16138403)x - 15423965}{47104 \sqrt{2x^2 - x + 3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")

[Out] 1168881/8192*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1) + 1/47104*((46*(20*(40*(20*x + 63)*x + 2853)*x - 125091)*x + 16138403)*x - 15423965)/sqrt(2*x^2 - x + 3)

$$3.88 \quad \int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^{3/2}} dx$$

Optimal. Leaf size=82

$$\frac{121(19-7x)}{92\sqrt{2x^2-x+3}} + \frac{25}{8}x\sqrt{2x^2-x+3} + \frac{415}{32}\sqrt{2x^2-x+3} - \frac{223 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{2}}$$

[Out] (121*(19 - 7*x))/(92*Sqrt[3 - x + 2*x^2]) + (415*Sqrt[3 - x + 2*x^2])/32 + (25*x*Sqrt[3 - x + 2*x^2])/8 - (223*ArcSinh[(1 - 4*x)/Sqrt[23]])/(64*Sqrt[2])

Rubi [A] time = 0.126512, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{121(19-7x)}{92\sqrt{2x^2-x+3}} + \frac{25}{8}x\sqrt{2x^2-x+3} + \frac{415}{32}\sqrt{2x^2-x+3} - \frac{223 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(3/2), x]

[Out] (121*(19 - 7*x))/(92*Sqrt[3 - x + 2*x^2]) + (415*Sqrt[3 - x + 2*x^2])/32 + (25*x*Sqrt[3 - x + 2*x^2])/8 - (223*ArcSinh[(1 - 4*x)/Sqrt[23]])/(64*Sqrt[2])

Rubi in Sympy [A] time = 46.3233, size = 112, normalized size = 1.37

$$\frac{2(-4x+1)(5x^2+3x+2)^2}{23\sqrt{2x^2-x+3}} - \frac{(2400x+2040)\sqrt{2x^2-x+3}(5x^2+3x+2)}{2760} + \frac{(148200x+505470)\sqrt{2x^2-x+3}}{22080} + \frac{223\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{128}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(3/2), x)

[Out] -2*(-4*x + 1)*(5*x**2 + 3*x + 2)**2/(23*sqrt(2*x**2 - x + 3)) - (2400*x + 2040)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/2760 + (14

$8200x + 505470) \cdot \sqrt{2x^2 - x + 3} / 22080 + 223 \cdot \sqrt{2} \cdot \operatorname{atanh}(\sqrt{2} \cdot (4x - 1) / (4 \cdot \sqrt{2x^2 - x + 3})) / 128$

Mathematica [A] time = 0.0787709, size = 55, normalized size = 0.67

$$\frac{4600x^3 + 16790x^2 - 9421x + 47027}{736\sqrt{2x^2 - x + 3}} + \frac{223 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{64\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(3/2), x]

[Out] (47027 - 9421*x + 16790*x^2 + 4600*x^3)/(736*sqrt[3 - x + 2*x^2]) + (223*ArcSinh[(-1 + 4*x)/sqrt[23]])/(64*sqrt[2])

Maple [A] time = 0.009, size = 98, normalized size = 1.2

$$\begin{aligned} & -\frac{54852x - 13713}{5888} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{15761}{256} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{223x}{64} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & + \frac{223\sqrt{2}}{128} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{365x^2}{16} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{25x^3}{4} \frac{1}{\sqrt{2x^2 - x + 3}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^2/(2*x^2-x+3)^(3/2), x)

[Out] -13713/5888*(4*x-1)/(2*x^2-x+3)^(1/2)+15761/256/(2*x^2-x+3)^(1/2) -223/64*x/(2*x^2-x+3)^(1/2)+223/128*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+365/16*x^2/(2*x^2-x+3)^(1/2)+25/4*x^3/(2*x^2-x+3)^(1/2)

Maxima [A] time = 0.782227, size = 108, normalized size = 1.32

$$\begin{aligned} & \frac{25x^3}{4\sqrt{2x^2 - x + 3}} + \frac{365x^2}{16\sqrt{2x^2 - x + 3}} + \frac{223}{128} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x - 1)\right) \\ & - \frac{9421x}{736\sqrt{2x^2 - x + 3}} + \frac{47027}{736\sqrt{2x^2 - x + 3}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")

[Out] 25/4*x^3/sqrt(2*x^2 - x + 3) + 365/16*x^2/sqrt(2*x^2 - x + 3) + 23/128*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 9421/736*x/sqrt(2*x^2 - x + 3) + 47027/736/sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.279848, size = 132, normalized size = 1.61

$$\frac{\sqrt{2}\left(4\sqrt{2}(4600x^3 + 16790x^2 - 9421x + 47027)\sqrt{2x^2 - x + 3} + 5129(2x^2 - x + 3)\log\left(-\sqrt{2}(32x^2 - 16x + 25) - 8\sqrt{2x^2 - x + 3}\right)\right)}{5888(2x^2 - x + 3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")

[Out] 1/5888*sqrt(2)*(4*sqrt(2)*(4600*x^3 + 16790*x^2 - 9421*x + 47027)*sqrt(2*x^2 - x + 3) + 5129*(2*x^2 - x + 3)*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(2*x^2 - x + 3)

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

$$\int \frac{(5x^2 + 3x + 2)^2}{(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(3/2),x)

[Out] Integral((5*x**2 + 3*x + 2)**2/(2*x**2 - x + 3)**(3/2), x)

GIAC/XCAS [A] time = 0.271948, size = 84, normalized size = 1.02

$$-\frac{223}{128}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right) + \frac{(230(20x + 73)x - 9421)x + 47027}{736\sqrt{2x^2 - x + 3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")

```
[Out] -223/128*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3))
+ 1) + 1/736*((230*(20*x + 73)*x - 9421)*x + 47027)/sqrt(2*x^2 -
x + 3)
```


$$3.89 \quad \int \frac{2+3x+5x^2}{(3-x+2x^2)^{3/2}} dx$$

Optimal. Leaf size=45

$$-\frac{11(3x+5)}{23\sqrt{2x^2-x+3}} - \frac{5 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2\sqrt{2}}$$

[Out] (-11*(5 + 3*x))/(23*Sqrt[3 - x + 2*x^2]) - (5*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2*Sqrt[2])

Rubi [A] time = 0.0544134, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$-\frac{11(3x+5)}{23\sqrt{2x^2-x+3}} - \frac{5 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(3/2), x]

[Out] (-11*(5 + 3*x))/(23*Sqrt[3 - x + 2*x^2]) - (5*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2*Sqrt[2])

Rubi in Sympy [A] time = 9.59914, size = 51, normalized size = 1.13

$$-\frac{33x+55}{23\sqrt{2x^2-x+3}} + \frac{5\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(3/2), x)

[Out] -(33*x + 55)/(23*sqrt(2*x**2 - x + 3)) + 5*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/4

Mathematica [A] time = 0.0520673, size = 45, normalized size = 1.

$$\frac{5 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{2\sqrt{2}} - \frac{11(3x+5)}{23\sqrt{2x^2-x+3}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(3/2), x]

[Out] (-11*(5 + 3*x))/(23*sqrt[3 - x + 2*x^2]) + (5*ArcSinh[(-1 + 4*x)/sqrt[23]])/(2*sqrt[2])

Maple [A] time = 0.007, size = 64, normalized size = 1.4

$$\frac{196x-49}{184} \frac{1}{\sqrt{2x^2-x+3}} - \frac{17}{8} \frac{1}{\sqrt{2x^2-x+3}} - \frac{5x}{2} \frac{1}{\sqrt{2x^2-x+3}} + \frac{5\sqrt{2}}{4} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)/(2*x^2-x+3)^(3/2), x)

[Out] 49/184*(4*x-1)/(2*x^2-x+3)^(1/2)-17/8/(2*x^2-x+3)^(1/2)-5/2*x/(2*x^2-x+3)^(1/2)+5/4*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))

Maxima [A] time = 0.781412, size = 62, normalized size = 1.38

$$\frac{5}{4} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23} \sqrt{23}(4x-1)\right) - \frac{33x}{23\sqrt{2x^2-x+3}} - \frac{55}{23\sqrt{2x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(3/2), x, algorithm="maxima")

[Out] 5/4*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 33/23*x/sqrt(2*x^2 - x + 3) - 55/23/sqrt(2*x^2 - x + 3)

Fricas [A] time = 0.277572, size = 119, normalized size = 2.64

$$\frac{\sqrt{2}\left(44\sqrt{2}\sqrt{2x^2-x+3}(3x+5) - 115(2x^2-x+3)\log\left(-\sqrt{2}(32x^2-16x+25) - 8\sqrt{2x^2-x+3}(4x-1)\right)\right)}{184(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(3/2), x, algorithm="fricas")`

[Out]
$$-1/184*\sqrt{2}*(44*\sqrt{2}*\sqrt{2*x^2 - x + 3}*(3*x + 5) - 115*(2*x^2 - x + 3)*\log(-\sqrt{2}*(32*x^2 - 16*x + 25) - 8*\sqrt{2*x^2 - x + 3}*(4*x - 1)))/(2*x^2 - x + 3)$$

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

$$\int \frac{5x^2 + 3x + 2}{(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(3/2), x)`

[Out] `Integral((5*x**2 + 3*x + 2)/(2*x**2 - x + 3)**(3/2), x)`

GIAC/XCAS [A] time = 0.272084, size = 72, normalized size = 1.6

$$-\frac{5}{4}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right) - \frac{11(3x + 5)}{23\sqrt{2x^2 - x + 3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(3/2), x, algorithm="giac")`

[Out]
$$-5/4*\sqrt{2}*\ln(-2*\sqrt{2}*(\sqrt{2}*x - \sqrt{2*x^2 - x + 3}) + 1) - 11/23*(3*x + 5)/\sqrt{2*x^2 - x + 3}$$

$$3.90 \quad \int \frac{1}{(3-x+2x^2)^{3/2}(2+3x+5x^2)} dx$$

Optimal. Leaf size=176

$$\frac{13-6x}{253\sqrt{2x^2-x+3}} + \frac{1}{22}\sqrt{\frac{1}{682}(247+500\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(247+500\sqrt{2})}}((69+65\sqrt{2})x+4\sqrt{2}+61)}{\sqrt{2x^2-x+3}}\right) - \frac{1}{22}\sqrt{\frac{1}{682}(500\sqrt{2}-247)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(500\sqrt{2}-247)}}((69-65\sqrt{2})x-4\sqrt{2}+61)}{\sqrt{2x^2-x+3}}\right)$$

[Out] (13 - 6*x)/(253*Sqrt[3 - x + 2*x^2]) + (Sqrt[(247 + 500*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(247 + 500*Sqrt[2]))])*(61 + 4*Sqrt[2] + (69 + 65*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/22 - (Sqrt[(-247 + 500*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-247 + 500*Sqrt[2]))])*(61 - 4*Sqrt[2] + (69 - 65*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/22

Rubi [A] time = 0.832572, antiderivative size = 176, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{13-6x}{253\sqrt{2x^2-x+3}} + \frac{1}{22}\sqrt{\frac{1}{682}(247+500\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(247+500\sqrt{2})}}((69+65\sqrt{2})x+4\sqrt{2}+61)}{\sqrt{2x^2-x+3}}\right) - \frac{1}{22}\sqrt{\frac{1}{682}(500\sqrt{2}-247)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(500\sqrt{2}-247)}}((69-65\sqrt{2})x-4\sqrt{2}+61)}{\sqrt{2x^2-x+3}}\right)$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)), x]

[Out] (13 - 6*x)/(253*Sqrt[3 - x + 2*x^2]) + (Sqrt[(247 + 500*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(247 + 500*Sqrt[2]))])*(61 + 4*Sqrt[2] + (69 + 65*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/22 - (Sqrt[(-247 + 500*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-247 + 500*Sqrt[2]))])*(61 - 4*Sqrt[2] + (69 - 65*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/22

Rubi in Sympy [A] time = 79.3106, size = 207, normalized size = 1.18

$$\frac{-66x + 143}{2783\sqrt{2x^2 - x + 3}} + \frac{\sqrt{682} \left(8349 + 22264\sqrt{2} \right) \left(5566\sqrt{2} + \frac{169763}{2} \right) \operatorname{atan} \left(\frac{2\sqrt{341} \left(x \left(\frac{192027}{2} + \frac{180895\sqrt{2}}{2} \right) + 5566\sqrt{2} + \frac{169763}{2} \right)}{86273\sqrt{247+500\sqrt{2}}\sqrt{2x^2-x+3}} \right)}{58103657678\sqrt{247 + 500\sqrt{2}}} + \frac{\sqrt{682} \left(-22264\sqrt{2} + 8349 \right) \left(-5566\sqrt{2} + \frac{169763}{2} \right) \operatorname{atanh} \left(\frac{2\sqrt{341} \left(x \left(-\frac{180895\sqrt{2}}{2} + \frac{192027}{2} \right) - 5566\sqrt{2} + \frac{169763}{2} \right)}{86273\sqrt{-247+500\sqrt{2}}\sqrt{2x^2-x+3}} \right)}{58103657678\sqrt{-247 + 500\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2),x)`

[Out] `(-66*x + 143)/(2783*sqrt(2*x**2 - x + 3)) + sqrt(682)*(8349 + 22264*sqrt(2))*(5566*sqrt(2) + 169763/2)*atan(2*sqrt(341)*(x*(192027/2 + 180895*sqrt(2)/2) + 5566*sqrt(2) + 169763/2)/(86273*sqrt(247 + 500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(58103657678*sqrt(247 + 500*sqrt(2))) + sqrt(682)*(-22264*sqrt(2) + 8349)*(-5566*sqrt(2) + 169763/2)*atanh(2*sqrt(341)*(x*(-180895*sqrt(2)/2 + 192027/2) - 5566*sqrt(2) + 169763/2)/(86273*sqrt(-247 + 500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(58103657678*sqrt(-247 + 500*sqrt(2)))`

Mathematica [C] time = 6.39428, size = 1129, normalized size = 6.41

$$\begin{aligned}
 & \frac{13 - 6x}{253\sqrt{2x^2 - x + 3}} \\
 & 5(-13i + \sqrt{31}) \tan^{-1} \left(\frac{4439i\sqrt{31}x^4 + 17732x^4 - 2200i\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 5120i\sqrt{31}x^3 - 17050x^3 + 4980i\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^2 + 6405i\sqrt{31}x^2 - 1364\sqrt{31}x^4 + 24293ix^4 - 3410\sqrt{31}x^3 - 85640ix^3 + 4774\sqrt{31}x^2}{22\sqrt{682}(-13 + i\sqrt{31})} \right) \\
 & + \frac{5i(13i + \sqrt{31}) \tan^{-1} \left(\frac{31(44\sqrt{31}x^4 + 797ix^4 - 110\sqrt{31}x^3 - 1160ix^3 + 154\sqrt{31}x^2 + 4439i\sqrt{31}x^4 - 17732x^4 + 400i\sqrt{682}(13+i\sqrt{31})\sqrt{2x^2-x+3}x^3 + 5120i\sqrt{31}x^3 + 17050x^3 + 140i\sqrt{682}(13+i\sqrt{31})\sqrt{2x^2-x+3}x^2 + 6405i\sqrt{31}x^2 - 1364\sqrt{31}x^4 + 24293ix^4 - 3410\sqrt{31}x^3 - 85640ix^3 + 4774\sqrt{31}x^2)}{22\sqrt{682}(13 + i\sqrt{31})} \right)}{22\sqrt{682}(13 + i\sqrt{31})} \\
 & + \frac{5(13i + \sqrt{31}) \log \left(\left(-10ix + \sqrt{31} - 3i \right)^2 \left(10ix + \sqrt{31} + 3i \right)^2 \right)}{44\sqrt{682}(13 + i\sqrt{31})} \\
 & - \frac{5i(-13i + \sqrt{31}) \log \left(\left(-10ix + \sqrt{31} - 3i \right)^2 \left(10ix + \sqrt{31} + 3i \right)^2 \right)}{44\sqrt{682}(-13 + i\sqrt{31})} \\
 & + \frac{5i(-13i + \sqrt{31}) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682}(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x - 22\sqrt{31}x + 469ix + i\sqrt{682}(-13 + i\sqrt{31}) \right) \right)}{44\sqrt{682}(-13 + i\sqrt{31})} \\
 & + \frac{5(13i + \sqrt{31}) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13 + i\sqrt{31})}\sqrt{2x^2 - x + 3}x - 22\sqrt{31}x + 1041ix - 63i\sqrt{22(13 + i\sqrt{31})}\sqrt{2x^2 - x + 3} \right) \right)}{44\sqrt{682}(13 + i\sqrt{31})}
 \end{aligned}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)),x]

[Out] (13 - 6*x)/(253*Sqrt[3 - x + 2*x^2]) - (5*(-13*I + Sqrt[31])*ArcTan[(-14322 + (602*I)*Sqrt[31] - 7502*x - (4266*I)*Sqrt[31]*x + 21142*x^2 + (6405*I)*Sqrt[31]*x^2 - 17050*x^3 + (5120*I)*Sqrt[31]*x^3 + 17732*x^4 + (4439*I)*Sqrt[31]*x^4 + (2520*I)*Sqrt[22*(-13 + I*Sqrt[31])])*Sqrt[3 - x + 2*x^2] + (2900*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (4980*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - (2200*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(82294*I + 2046*Sqrt[31] + (58298*I)*x - 4774*Sqrt[31]*x + (88855*I)*x^2 + 4774*Sqrt[31]*x^2 - (85640*I)*x^3 - 3410*Sqrt[31]*x^3 + (24293*I)*x^4 + 1364*Sqrt[31]*x^4)]/(

$$\begin{aligned}
& 22*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])]) + (((5*I)/22)*(13*I + \text{Sqrt}[31])* \\
& \text{ArcTan}[(31*(-74*I + 66*\text{Sqrt}[31] + (42*I)*x - 154*\text{Sqrt}[31]*x + (12 \\
& 95*I)*x^2 + 154*\text{Sqrt}[31]*x^2 - (1160*I)*x^3 - 110*\text{Sqrt}[31]*x^3 + \\
& (797*I)*x^4 + 44*\text{Sqrt}[31]*x^4))/(14322 + (602*I)*\text{Sqrt}[31] + 7502* \\
& x - (4266*I)*\text{Sqrt}[31]*x - 21142*x^2 + (6405*I)*\text{Sqrt}[31]*x^2 + 170 \\
& 50*x^3 + (5120*I)*\text{Sqrt}[31]*x^3 - 17732*x^4 + (4439*I)*\text{Sqrt}[31]*x^4 \\
& 4 - (40*I)*\text{Sqrt}[682*(13 + I*\text{Sqrt}[31])]*\text{Sqrt}[3 - x + 2*x^2] + (100 \\
& *I)*\text{Sqrt}[682*(13 + I*\text{Sqrt}[31])]*x*\text{Sqrt}[3 - x + 2*x^2] + (140*I)*\text{S} \\
& \text{qrt}[682*(13 + I*\text{Sqrt}[31])]*x^2*\text{Sqrt}[3 - x + 2*x^2] + (400*I)*\text{Sqrt} \\
& [682*(13 + I*\text{Sqrt}[31])]*x^3*\text{Sqrt}[3 - x + 2*x^2]))/\text{Sqrt}[682*(13 + \\
& I*\text{Sqrt}[31])] - (((5*I)/44)*(-13*I + \text{Sqrt}[31])* \text{Log}[(-3*I + \text{Sqrt}[3 \\
& 1] - (10*I)*x)^2*(3*I + \text{Sqrt}[31] + (10*I)*x)^2]/\text{Sqrt}[682*(-13 + \\
& I*\text{Sqrt}[31])] + (5*(13*I + \text{Sqrt}[31])* \text{Log}[(-3*I + \text{Sqrt}[31] - (10*I) \\
& *x)^2*(3*I + \text{Sqrt}[31] + (10*I)*x)^2])/((44*\text{Sqrt}[682*(13 + I*\text{Sqrt}[3 \\
& 1])]) + (((5*I)/44)*(-13*I + \text{Sqrt}[31])* \text{Log}[(2 + 3*x + 5*x^2)*(-14 \\
& 2*I + 66*\text{Sqrt}[31] + (469*I)*x - 22*\text{Sqrt}[31]*x + (327*I)*x^2 + 44* \\
& \text{Sqrt}[31]*x^2 + I*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])]*\text{Sqrt}[3 - x + 2*x^2] \\
& - (4*I)*\text{Sqrt}[682*(-13 + I*\text{Sqrt}[31])]*x*\text{Sqrt}[3 - x + 2*x^2])))/\text{Sq} \\
& \text{rt}[682*(-13 + I*\text{Sqrt}[31])] - (5*(13*I + \text{Sqrt}[31])* \text{Log}[(2 + 3*x + \\
& 5*x^2)*(-1858*I + 66*\text{Sqrt}[31] + (1041*I)*x - 22*\text{Sqrt}[31]*x - (817 \\
& *I)*x^2 + 44*\text{Sqrt}[31]*x^2 - (63*I)*\text{Sqrt}[22*(13 + I*\text{Sqrt}[31])]*\text{Sqr} \\
& \text{t}[3 - x + 2*x^2] + (22*I)*\text{Sqrt}[22*(13 + I*\text{Sqrt}[31])]*x*\text{Sqrt}[3 - x \\
& + 2*x^2])))/(44*\text{Sqrt}[682*(13 + I*\text{Sqrt}[31])])
\end{aligned}$$

Maple [B] time = 0.037, size = 718, normalized size = 4.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(2*x^2-x+3)^{(3/2)}/(5*x^2+3*x+2), x)$

[Out] $1/465124*(8*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+3*2^{(1/2)}*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+8-3*2^{(1/2)})^{(1/2)}*2^{(1/2)}*(2197*2^{(1/2)}*\text{arctan}(1/11692487*(-775687+549362*2^{(1/2)})^{(1/2)}*(-23*(8+3*2^{(1/2)}))^{(1/2)}*(-23*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+24*2^{(1/2)}-41))^{(1/2)}*(6485*2^{(1/2)}*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+10368*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+22379*2^{(1/2)}+32016)/(23*(2^{(1/2)}-1+x)^4/(2^{(1/2)}+1-x)^4+82*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+23)*(8+3*2^{(1/2)})*(2^{(1/2)}-1+x)/(2^{(1/2)}+1-x))*(-8866+6820*2^{(1/2)})^{(1/2)}*(-775687+549362*2^{(1/2)})^{(1/2)}+3070*\text{arctan}(1/11692487*(-775687+549362*2^{(1/2)})^{(1/2)}*(-23*(8+3*2^{(1/2)}))^{(1/2)}*(-23*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+24*2^{(1/2)}-41))^{(1/2)}*(6485*2^{(1/2)}*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+10368*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+22379*2^{(1/2)}+32016)/(23*(2^{(1/2)}-1+x)^4/(2^{(1/2)}+1-x)^4+82*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+23)*(8+3*2^{(1/2)})*(2^{(1/2)}-1+x)/(2^{(1/2)}+1-x))*(-8866+6820*2^{(1/2)})^{(1/2)}*(-775687+549362*2^{(1/2)})^{(1/2)}+1712502*\text{arctanh}(31/2*(8*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+3*2^{(1/2)}*(2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+8-3*2^{(1/2)})^{(1/2)})/(-8866+6820*2^{(1/2)})^{(1/2)}*2^{(1/2)}-6617$

446*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)-3/506*(4*x-1)/(2*x^2-x+3)^(1/2)+1/22/(2*x^2-x+3)^(1/2)

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

$$\int \frac{1}{(5x^2 + 3x + 2)(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)),x, algorithm="maxima")

[Out] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)), x)

Fricas [A] time = 0.33274, size = 1463, normalized size = 8.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)),x, algorithm="fricas")

[Out] 1/213957040*sqrt(341)*sqrt(31)*sqrt(10)*(8*sqrt(341)*sqrt(31)*sqrt(10)*sqrt(2*x^2 - x + 3)*(500*sqrt(2)*(6*x - 13) - 1482*x + 3211)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 23*50^(1/4)*sqrt(31)*(494*x^2 - 500*sqrt(2)*(2*x^2 - x + 3) - 247*x + 741)*log(-25000*(sqrt(341)*50^(1/4)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 2962665725) - 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 167341615000*x^2 + 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) - 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) - 515685385000*x + 683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) - 23*50^(1/4)*sqrt(31)*(494*x^2 - 500*sqrt(2)*(2*x^2 - x + 3) - 247*x + 741)*log(25000*(sqrt(341)*50^(1/4)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 2962665725) - 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 167341615000*x^2 - 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) + 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) + 515685385000*x - 683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) - 3393


```

88*50^(1/4)*(2*x^2 - x + 3)*arctan(31*(sqrt(341)*sqrt(10)*(500*sqrt(2)*(x - 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 22*50^(1/4)*sqrt(2*x^2 - x + 3)*(61*sqrt(2) - 8))/(sqrt(341)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693*x + 5434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 4*sqrt(341)*sqrt(31)*(500*sqrt(2)*x - 247*x)*sqrt(-(sqrt(341)*50^(1/4)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 2962665725) - 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 167341615000*x^2 + 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) - 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) - 515685385000*x + 683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2))*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 682*50^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(3*sqrt(2) - 16))) - 339388*50^(1/4)*(2*x^2 - x + 3)*arctan(-31*(sqrt(341)*sqrt(10)*(500*sqrt(2)*(x - 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 22*50^(1/4)*sqrt(2*x^2 - x + 3)*(61*sqrt(2) - 8))/(sqrt(341)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693*x + 5434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 4*sqrt(341)*sqrt(31)*(500*sqrt(2)*x - 247*x)*sqrt((sqrt(341)*50^(1/4)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 2962665725) - 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 167341615000*x^2 - 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) + 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) + 515685385000*x - 683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2))*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 682*50^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(3*sqrt(2) - 16)))/((494*x^2 - 500*sqrt(2)*(2*x^2 - x + 3) - 247*x + 741)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)))

```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{3}{2}}(5x^2 + 3x + 2)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((2*x**2-x+3)**(3/2))/(5*x**2+3*x+2), x)

[Out] Integral(1/(((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2))), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.91 \quad \int \frac{1}{(3-x+2x^2)^{3/2}(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=211

$$\frac{-\frac{6315 - 2306x}{345092\sqrt{2x^2 - x + 3}} + \frac{65x + 4}{682\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)}}{\frac{\sqrt{\frac{1}{682}(129694447 + 103775000\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(129694447 + 103775000\sqrt{2})}}((45519 + 29065\sqrt{2})x + 16454\sqrt{2} + 12611)}}{\sqrt{2x^2 - x + 3}}\right)}}{+ \frac{\sqrt{\frac{1}{682}(103775000\sqrt{2} - 129694447)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(103775000\sqrt{2} - 129694447)}}((45519 - 29065\sqrt{2})x - 16454\sqrt{2} + 12611)}}{\sqrt{2x^2 - x + 3}}\right)}}{30008}}$$

[Out] $-(6315 - 2306*x)/(345092*\text{Sqrt}[3 - x + 2*x^2]) + (4 + 65*x)/(682*\text{Sqrt}[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (\text{Sqrt}[(129694447 + 103775000*\text{Sqrt}[2])/682]*\text{ArcTan}[(\text{Sqrt}[11/(31*(129694447 + 103775000*\text{Sqrt}[2]))]*(12611 + 16454*\text{Sqrt}[2] + (45519 + 29065*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/30008 - (\text{Sqrt}[(-129694447 + 103775000*\text{Sqrt}[2])/682]*\text{ArcTanh}[(\text{Sqrt}[11/(31*(-129694447 + 103775000*\text{Sqrt}[2]))]*(12611 - 16454*\text{Sqrt}[2] + (45519 - 29065*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/30008$

Rubi [A] time = 0.97548, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{-\frac{6315 - 2306x}{345092\sqrt{2x^2 - x + 3}} + \frac{65x + 4}{682\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)}}{\frac{\sqrt{\frac{1}{682}(129694447 + 103775000\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(129694447 + 103775000\sqrt{2})}}((45519 + 29065\sqrt{2})x + 16454\sqrt{2} + 12611)}}{\sqrt{2x^2 - x + 3}}\right)}}{+ \frac{\sqrt{\frac{1}{682}(103775000\sqrt{2} - 129694447)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(103775000\sqrt{2} - 129694447)}}((45519 - 29065\sqrt{2})x - 16454\sqrt{2} + 12611)}}{\sqrt{2x^2 - x + 3}}\right)}}{30008}}$$

Antiderivative was successfully verified.

[In] $\text{Int}[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2), x]$

[Out] $-(6315 - 2306*x)/(345092*\text{Sqrt}[3 - x + 2*x^2]) + (4 + 65*x)/(682*\text{Sqrt}[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (\text{Sqrt}[(129694447 + 103775000*\text{Sqrt}[2])/682]*\text{ArcTan}[(\text{Sqrt}[11/(31*(129694447 + 103775000*\text{Sqrt}[2]))]*(12611 + 16454*\text{Sqrt}[2] + (45519 + 29065*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/30008 - (\text{Sqrt}[(-129694447 + 103775000*\text{Sqrt}[2])/682]*\text{ArcTanh}[(\text{Sqrt}[11/(31*(-129694447 + 103775000*\text{Sqrt}[2]))]*(12611 - 16454*\text{Sqrt}[2] + (45519 - 29065*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/30008$

000*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(129694447 + 103775000*Sqrt[2]))]*(12611 + 16454*Sqrt[2] + (45519 + 29065*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]/30008 - (Sqrt[(-129694447 + 103775000*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-129694447 + 103775000*Sqrt[2]))]*(12611 - 16454*Sqrt[2] + (45519 - 29065*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]/30008

Rubi in Sympy [A] time = 99.9886, size = 248, normalized size = 1.18

$$\begin{aligned} & \frac{-139513x + \frac{764115}{2}}{20878066\sqrt{2x^2 - x + 3}} + \frac{715x + 44}{7502\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)} \\ & + \frac{\sqrt{682} \left(\frac{386060543}{4} + \frac{251853151\sqrt{2}}{2} \right) \left(33031427\sqrt{2} + \frac{142442289}{2} \right) \operatorname{atan} \left(\frac{4\sqrt{341} \left(x \left(\frac{889766845\sqrt{2}}{4} + \frac{1393473147}{4} \right) + \frac{386060543}{4} + \frac{251853151\sqrt{2}}{2} \right)}{949003\sqrt{129694447 + 103775000\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{2397415019451958\sqrt{129694447 + 103775000\sqrt{2}}} \\ & + \frac{\sqrt{682} \left(-\frac{251853151\sqrt{2}}{2} + \frac{386060543}{4} \right) \left(-33031427\sqrt{2} + \frac{142442289}{2} \right) \operatorname{atanh} \left(\frac{4\sqrt{341} \left(x \left(-\frac{889766845\sqrt{2}}{4} + \frac{1393473147}{4} \right) - \frac{251853151\sqrt{2}}{2} + \frac{386060543}{4} \right)}{949003\sqrt{-129694447 + 103775000\sqrt{2}}\sqrt{2x^2 - x + 3}} \right)}{2397415019451958\sqrt{-129694447 + 103775000\sqrt{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)`

[Out] `-(-139513*x + 764115/2)/(20878066*sqrt(2*x**2 - x + 3)) + (715*x + 44)/(7502*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)) + sqrt(682)*(386060543/4 + 251853151*sqrt(2)/2)*(33031427*sqrt(2) + 142442289/2)*atan(4*sqrt(341)*(x*(889766845*sqrt(2)/4 + 1393473147/4) + 386060543/4 + 251853151*sqrt(2)/2)/(949003*sqrt(129694447 + 103775000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(2397415019451958*sqrt(12969447 + 103775000*sqrt(2))) + sqrt(682)*(-251853151*sqrt(2)/2 + 386060543/4)*(-33031427*sqrt(2) + 142442289/2)*atanh(4*sqrt(341)*(x*(-889766845*sqrt(2)/4 + 1393473147/4) - 251853151*sqrt(2)/2 + 386060543/4)/(949003*sqrt(-129694447 + 103775000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(2397415019451958*sqrt(-129694447 + 103775000*sqrt(2)))`

Mathematica [C] time = 6.45325, size = 1170, normalized size = 5.55

$$\sqrt{2x^2 - x + 3} \left(\frac{-14x - 31}{5566(2x^2 - x + 3)} + \frac{345x - 98}{15004(5x^2 + 3x + 2)} \right)$$

$$5i \left(-5813i + 499\sqrt{31} \right) \tan^{-1} \left(\frac{31(10956044\sqrt{31}x^4 - 104765803 - 2241477661i\sqrt{31}x^4 + 3956537068ix^4 + 83020000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 - 1267524880i\sqrt{31}x^3 + 3951866050x^3 + 2905}{-2241477661i\sqrt{31}x^4 + 3956537068ix^4 + 83020000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 - 1267524880i\sqrt{31}x^3 + 3951866050x^3 + 2905} \right)$$

$$5i \left(5813i + 499\sqrt{31} \right) \tanh^{-1} \left(\frac{2241477661\sqrt{31}x^4 - 3956537068ix^4 + 456610000\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 1267524880\sqrt{31}x^3 - 3951866050ix^3 - 10335}{339637364\sqrt{31}x^4 + 13417689893ix^4 + 8220000000} \right)$$

$$+ \frac{5i \left(5813i + 499\sqrt{31} \right) \log \left(\left(-10ix + \sqrt{31} - 3i \right)^2 \left(10ix + \sqrt{31} + 3i \right)^2 \right)}{60016\sqrt{682(-13+i\sqrt{31})}}$$

$$- \frac{5 \left(-5813i + 499\sqrt{31} \right) \log \left(\left(-10ix + \sqrt{31} - 3i \right)^2 \left(10ix + \sqrt{31} + 3i \right)^2 \right)}{60016\sqrt{682(13+i\sqrt{31})}}$$

$$+ \frac{5i \left(5813i + 499\sqrt{31} \right) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix - 60016\sqrt{682(-13+i\sqrt{31})} \right) \right)}{60016\sqrt{682(-13+i\sqrt{31})}}$$

$$+ \frac{5 \left(-5813i + 499\sqrt{31} \right) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 1041ix - 60016\sqrt{682(13+i\sqrt{31})} \right) \right)}{60016\sqrt{682(13+i\sqrt{31})}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2), x]

[Out] Sqrt[3 - x + 2*x^2]*((-31 - 14*x)/(5566*(3 - x + 2*x^2)) + (-98 + 345*x)/(15004*(2 + 3*x + 5*x^2))) - (((5*I)/30008)*(-5813*I + 499*Sqrt[31])*ArcTan[(31*(67211446*I + 35267826*Sqrt[31] - (23627018*I)*x + 36393566*Sqrt[31]*x - (2553985*I)*x^2 + 23896114*Sqrt[31]*x^2 - (282686240*I)*x^3 + 26621650*Sqrt[31]*x^3 - (104765803*I)*x^4 + 10956044*Sqrt[31]*x^4))/(294638322 + (278507402*I)*Sqrt[31] + 8796989102*x - (311643066*I)*Sqrt[31]*x + 3166163858*x^2 - (2655130695*I)*Sqrt[31]*x^2 + 3951866050*x^3 - (1267524880*I)*Sqrt[31]*x^3 + 3956537068*x^4 - (2241477661*I)*Sqrt[31]*x^4 - (8302000*I)*Sqrt[682*(13 + I*Sqrt[31])])*Sqrt[3 - x + 2*x^2] + (20755000*

$$\begin{aligned}
& I \cdot \text{Sqrt}[682 \cdot (13 + I \cdot \text{Sqrt}[31])] \cdot x \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] + (29057000 \cdot \\
& I) \cdot \text{Sqrt}[682 \cdot (13 + I \cdot \text{Sqrt}[31])] \cdot x^2 \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] + (8302000 \\
& 0 \cdot I) \cdot \text{Sqrt}[682 \cdot (13 + I \cdot \text{Sqrt}[31])] \cdot x^3 \cdot \text{Sqrt}[3 - x + 2 \cdot x^2]) / \text{Sqrt}[\\
& 682 \cdot (13 + I \cdot \text{Sqrt}[31])] - (((5 \cdot I) / 30008) \cdot (5813 \cdot I + 499 \cdot \text{Sqrt}[31]) \cdot \text{A} \\
& \text{rcTanh}[(-294638322 \cdot I - 278507402 \cdot \text{Sqrt}[31] - (8796989102 \cdot I) \cdot x + 31 \\
& 1643066 \cdot \text{Sqrt}[31] \cdot x - (3166163858 \cdot I) \cdot x^2 + 2655130695 \cdot \text{Sqrt}[31] \cdot x^2 \\
& - (3951866050 \cdot I) \cdot x^3 + 1267524880 \cdot \text{Sqrt}[31] \cdot x^3 - (3956537068 \cdot I) \cdot \\
& x^4 + 2241477661 \cdot \text{Sqrt}[31] \cdot x^4 - 523026000 \cdot \text{Sqrt}[22 \cdot (-13 + I \cdot \text{Sqrt}[3 \\
& 1])] \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] - 601895000 \cdot \text{Sqrt}[22 \cdot (-13 + I \cdot \text{Sqrt}[31])] \cdot \\
& x \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] - 1033599000 \cdot \text{Sqrt}[22 \cdot (-13 + I \cdot \text{Sqrt}[31])] \cdot x^2 \\
& \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] + 456610000 \cdot \text{Sqrt}[22 \cdot (-13 + I \cdot \text{Sqrt}[31])] \cdot x^3 \\
& \cdot \text{Sqrt}[3 - x + 2 \cdot x^2]) / (14520445174 \cdot I + 1093302606 \cdot \text{Sqrt}[31] + (196 \\
& 94353658 \cdot I) \cdot x + 1128200546 \cdot \text{Sqrt}[31] \cdot x + (26853123535 \cdot I) \cdot x^2 + 740 \\
& 779534 \cdot \text{Sqrt}[31] \cdot x^2 - (16474806560 \cdot I) \cdot x^3 + 825271150 \cdot \text{Sqrt}[31] \cdot x^3 \\
& + (13417689893 \cdot I) \cdot x^4 + 339637364 \cdot \text{Sqrt}[31] \cdot x^4)) / \text{Sqrt}[682 \cdot (-13 \\
& + I \cdot \text{Sqrt}[31])] - (5 \cdot (-5813 \cdot I + 499 \cdot \text{Sqrt}[31]) \cdot \text{Log}[(-3 \cdot I + \text{Sqrt}[31 \\
&] - (10 \cdot I) \cdot x)^2 \cdot (3 \cdot I + \text{Sqrt}[31] + (10 \cdot I) \cdot x)^2]) / (60016 \cdot \text{Sqrt}[682 \cdot (\\
& 13 + I \cdot \text{Sqrt}[31])]) + (((5 \cdot I) / 60016) \cdot (5813 \cdot I + 499 \cdot \text{Sqrt}[31]) \cdot \text{Log}[(\\
& -3 \cdot I + \text{Sqrt}[31] - (10 \cdot I) \cdot x)^2 \cdot (3 \cdot I + \text{Sqrt}[31] + (10 \cdot I) \cdot x)^2]) / \text{Sqr} \\
& \text{t}[682 \cdot (-13 + I \cdot \text{Sqrt}[31])] - (((5 \cdot I) / 60016) \cdot (5813 \cdot I + 499 \cdot \text{Sqrt}[31] \\
&) \cdot \text{Log}[(2 + 3 \cdot x + 5 \cdot x^2) \cdot (-142 \cdot I + 66 \cdot \text{Sqrt}[31] + (469 \cdot I) \cdot x - 22 \cdot \text{Sq} \\
& \text{rt}[31] \cdot x + (327 \cdot I) \cdot x^2 + 44 \cdot \text{Sqrt}[31] \cdot x^2 + I \cdot \text{Sqrt}[682 \cdot (-13 + I \cdot \text{Sq} \\
& \text{rt}[31])] \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] - (4 \cdot I) \cdot \text{Sqrt}[682 \cdot (-13 + I \cdot \text{Sqrt}[31])] \\
& \cdot x \cdot \text{Sqrt}[3 - x + 2 \cdot x^2])]) / \text{Sqrt}[682 \cdot (-13 + I \cdot \text{Sqrt}[31])] + (5 \cdot (-581 \\
& 3 \cdot I + 499 \cdot \text{Sqrt}[31]) \cdot \text{Log}[(2 + 3 \cdot x + 5 \cdot x^2) \cdot (-1858 \cdot I + 66 \cdot \text{Sqrt}[31] \\
& + (1041 \cdot I) \cdot x - 22 \cdot \text{Sqrt}[31] \cdot x - (817 \cdot I) \cdot x^2 + 44 \cdot \text{Sqrt}[31] \cdot x^2 - (6 \\
& 3 \cdot I) \cdot \text{Sqrt}[22 \cdot (13 + I \cdot \text{Sqrt}[31])] \cdot \text{Sqrt}[3 - x + 2 \cdot x^2] + (22 \cdot I) \cdot \text{Sqrt} \\
& [22 \cdot (13 + I \cdot \text{Sqrt}[31])] \cdot x \cdot \text{Sqrt}[3 - x + 2 \cdot x^2])]) / (60016 \cdot \text{Sqrt}[682 \cdot (\\
& 13 + I \cdot \text{Sqrt}[31])])
\end{aligned}$$

Maple [B] time = 0.096, size = 5942, normalized size = 28.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(2 \cdot x^2 - x + 3)^{(3/2)} / (5 \cdot x^2 + 3 \cdot x + 2)^2, x)$

[Out] result too large to display

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

$$\int \frac{1}{(5x^2 + 3x + 2)^2(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)), x)
```

Fricas [A] time = 0.373024, size = 1588, normalized size = 7.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)),x, algorithm="fricas")
```

```
[Out] 1/413093216787056960*232562^(3/4)*sqrt(20755)*sqrt(31)*(8*232562^(1/4)*sqrt(20755)*sqrt(31)*(239305150000*x^3 - 5117560350000*x^2 - 129694447*sqrt(2)*(11530*x^3 - 24657*x^2 + 18557*x - 10606) + 3851505350000*x - 2201275300000)*sqrt(2*x^2 - x + 3)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) - 35183643812*sqrt(20755)*sqrt(2)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*arctan(31*(232562^(1/4)*sqrt(20755)*(129694447*sqrt(2)*(x - 6) - 207550000*x + 1245300000)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) + 44*sqrt(20755)*sqrt(2*x^2 - x + 3)*(16454*sqrt(2) - 12611))/(2*232562^(1/4)*sqrt(20755)*sqrt(31)*(129694447*sqrt(2)*x - 207550000*x)*sqrt(-sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845314290690421779084003227*x + 120958472180713824696109941475) - 412803786471404246475193944702*x - 170886842109976597082974061752)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) + 2630090037883560819397600000*x^2 + sqrt(2)*(732240976456218637218650000*x^2 - 10561816872283408300652623*sqrt(2)*(49*x^2 - 151*x + 200) - 2256497702956918657551350000*x + 2988738679413137294770000000) - 929439884760939930457430824*sqrt(2)*(2*x^2 - x + 3) - 1315045018941780409698800000*x + 3945135056825341229096400000)/(10561816872283408300652623*sqrt(2)*x^2 - 14943693397065686473850000*x^2))*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) + 232562^(1/4)*sqrt(20755)*sqrt(31)*(129694447*sqrt(2)*(19*x - 22) - 3943450000*x + 4566100000)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) - 1364*sqrt(20755)*sqrt(31)*sqrt(2*x^2 - x + 3)*(2158*sqrt(2) - 4653)) - 35183643812*sqrt(20755)*sqrt(2)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*arctan(-31*(232562^(1/4)*sqrt(20755)*(129694447*sqrt(2)*(x - 6) - 207550000*x + 1245300000)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) - 44*sqrt(20755)*sqrt(2*x^2 - x + 3)*(16454*sqrt(2) - 12611))/(2*232562^(1/4)*sqrt(20755)*sqrt(31)*(129694447*sqrt(2)*x - 207550000*x)*sqrt(sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845314290690421779084003227*x + 120958472180713824696109941475) - 412803786471404246475193944702*x - 170886842109976597082974061752)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832635809)) - 26300900
```

```

37883560819397600000*x^2 - sqrt(2)*(732240976456218637218650000*x
^2 - 10561816872283408300652623*sqrt(2)*(49*x^2 - 151*x + 200) -
2256497702956918657551350000*x + 2988738679413137294770000000) +
929439884760939930457430824*sqrt(2)*(2*x^2 - x + 3) + 13150450189
41780409698800000*x - 3945135056825341229096400000)/(105618168722
83408300652623*sqrt(2)*x^2 - 14943693397065686473850000*x^2))*sqr
t((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38
359150832635809)) + 232562^(1/4)*sqrt(20755)*sqrt(31)*(129694447*
sqrt(2)*(19*x - 22) - 3943450000*x + 4566100000)*sqrt((129694447*
sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 383591508326358
09)) + 1364*sqrt(20755)*sqrt(31)*sqrt(2*x^2 - x + 3)*(2158*sqrt(2)
) - 4653))) + 23*sqrt(20755)*sqrt(31)*(2075500000*x^4 + 207550000
*x^3 + 3320800000*x^2 - 129694447*sqrt(2)*(10*x^4 + x^3 + 16*x^2
+ 7*x + 6) + 1452850000*x + 1245300000)*log(-673078164062500*sqrt
(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845314290690
421779084003227*x + 120958472180713824696109941475) - 41280378647
1404246475193944702*x - 170886842109976597082974061752)*sqrt((129
694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150
832635809)) + 2630090037883560819397600000*x^2 + sqrt(2)*(7322409
76456218637218650000*x^2 - 10561816872283408300652623*sqrt(2)*(49
*x^2 - 151*x + 200) - 2256497702956918657551350000*x + 2988738679
413137294770000000) - 929439884760939930457430824*sqrt(2)*(2*x^2
- x + 3) - 1315045018941780409698800000*x + 394513505682534122909
6400000)/(10561816872283408300652623*sqrt(2)*x^2 - 14943693397065
686473850000*x^2)) - 23*sqrt(20755)*sqrt(31)*(2075500000*x^4 + 20
7550000*x^3 + 3320800000*x^2 - 129694447*sqrt(2)*(10*x^4 + x^3 +
16*x^2 + 7*x + 6) + 1452850000*x + 1245300000)*log(67307816406250
0*sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845314
290690421779084003227*x + 120958472180713824696109941475) - 41280
3786471404246475193944702*x - 170886842109976597082974061752)*sqr
t((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38
359150832635809)) - 2630090037883560819397600000*x^2 - sqrt(2)*(7
32240976456218637218650000*x^2 - 10561816872283408300652623*sqrt(
2)*(49*x^2 - 151*x + 200) - 2256497702956918657551350000*x + 2988
738679413137294770000000) + 929439884760939930457430824*sqrt(2)*(
2*x^2 - x + 3) + 1315045018941780409698800000*x - 394513505682534
1229096400000)/(10561816872283408300652623*sqrt(2)*x^2 - 14943693
397065686473850000*x^2)))/((2075500000*x^4 + 207550000*x^3 + 3320
800000*x^2 - 129694447*sqrt(2)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)
+ 1452850000*x + 1245300000)*sqrt((129694447*sqrt(2) - 207550000)
/(26918082474850000*sqrt(2) - 38359150832635809)))

```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)

[Out] Integral(1/((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)),x, algorithm="giac")

[Out] Exception raised: RuntimeError

$$3.92 \quad \int \frac{1}{(3-x+2x^2)^{3/2}(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=246

$$\begin{aligned} & -\frac{4353943 - 6508666x}{941410976\sqrt{2x^2 - x + 3}} + \frac{5(17315x + 7318)}{1860496\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)} + \frac{65x + 4}{1364\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)^2} \\ & + 3\sqrt{\frac{1}{682} (13874275807943 + 9819738650000\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(13874275807943 + 9819738650000\sqrt{2})}} ((13785797 + 9662095\sqrt{2})x + 4123702\sqrt{2} + 5538393)}{\sqrt{2x^2 - x + 3}} \right) \\ & + \frac{81861824}{3\sqrt{\frac{1}{682} (9819738650000\sqrt{2} - 13874275807943)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(9819738650000\sqrt{2} - 13874275807943)}} ((13785797 - 9662095\sqrt{2})x - 4123702\sqrt{2} + 5538393)}{\sqrt{2x^2 - x + 3}} \right)} \\ & - \frac{81861824}{81861824} \end{aligned}$$

[Out] $-(4353943 - 6508666*x)/(941410976*\text{Sqrt}[3 - x + 2*x^2]) + (4 + 65*x)/(1364*\text{Sqrt}[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2) + (5*(7318 + 17315*x))/(1860496*\text{Sqrt}[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (3*\text{Sqrt}[(13874275807943 + 9819738650000*\text{Sqrt}[2])/682]*\text{ArcTan}[(\text{Sqrt}[11/(31*(13874275807943 + 9819738650000*\text{Sqrt}[2]))])*(5538393 + 4123702*\text{Sqrt}[2] + (13785797 + 9662095*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2])/81861824 - (3*\text{Sqrt}[(-13874275807943 + 9819738650000*\text{Sqrt}[2])/682]*\text{ArcTanh}[(\text{Sqrt}[11/(31*(-13874275807943 + 9819738650000*\text{Sqrt}[2]))])*(5538393 - 4123702*\text{Sqrt}[2] + (13785797 - 9662095*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2])/81861824$

Rubi [A] time = 1.08326, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\begin{aligned} & -\frac{4353943 - 6508666x}{941410976\sqrt{2x^2 - x + 3}} + \frac{5(17315x + 7318)}{1860496\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)} + \frac{65x + 4}{1364\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)^2} \\ & + 3\sqrt{\frac{1}{682} (13874275807943 + 9819738650000\sqrt{2})} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(13874275807943 + 9819738650000\sqrt{2})}} ((13785797 + 9662095\sqrt{2})x + 4123702\sqrt{2} + 5538393)}{\sqrt{2x^2 - x + 3}} \right) \\ & + \frac{81861824}{3\sqrt{\frac{1}{682} (9819738650000\sqrt{2} - 13874275807943)} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(9819738650000\sqrt{2} - 13874275807943)}} ((13785797 - 9662095\sqrt{2})x - 4123702\sqrt{2} + 5538393)}{\sqrt{2x^2 - x + 3}} \right)} \\ & - \frac{81861824}{81861824} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3), x]

[Out] $-(4353943 - 6508666*x)/(941410976*\sqrt{3 - x + 2*x^2}) + (4 + 65*x)/(1364*\sqrt{3 - x + 2*x^2}*(2 + 3*x + 5*x^2)^2) + (5*(7318 + 17315*x))/(1860496*\sqrt{3 - x + 2*x^2}*(2 + 3*x + 5*x^2)) + (3*\sqrt{((13874275807943 + 9819738650000*\sqrt{2})/682)*\text{ArcTan}[(\sqrt{11/(31*(13874275807943 + 9819738650000*\sqrt{2}))})*(5538393 + 4123702*\sqrt{2} + (13785797 + 9662095*\sqrt{2})*x)]/\sqrt{3 - x + 2*x^2}})/81861824 - (3*\sqrt{((-13874275807943 + 9819738650000*\sqrt{2})/682)*\text{ArcTanh}[(\sqrt{11/(31*(-13874275807943 + 9819738650000*\sqrt{2}))})*(5538393 - 4123702*\sqrt{2} + (13785797 - 9662095*\sqrt{2})*x)]/\sqrt{3 - x + 2*x^2}})/81861824$

Rubi in Sympy [A] time = 130.217, size = 286, normalized size = 1.16

$$\begin{aligned} & -\frac{-\frac{4331517223x}{2} + \frac{5795098133}{4}}{313254502264\sqrt{2x^2 - x + 3}} + \frac{715x + 44}{15004\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)^2} \\ & + \frac{\frac{10475575x}{2} + 2213695}{112560008\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)} \\ & + \frac{\sqrt{682}\left(\frac{5595045221997}{8} + \frac{2082941673879\sqrt{2}}{4}\right)\left(\frac{428162326383\sqrt{2}}{2} + \frac{1255552000131}{4}\right)\text{atan}\left(\frac{8\sqrt{341}\left(x\left(\frac{9760928569755\sqrt{2}}{8} + \frac{13926811917513}{8}\right) + \frac{5595045221997}{8} + \frac{2082941673879\sqrt{2}}{4}\right)}{31317099\sqrt{13874275807943+9819738650000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{593518446705643434228\sqrt{13874275807943 + 9819738650000\sqrt{2}}} \\ & + \frac{\sqrt{682}\left(-\frac{2082941673879\sqrt{2}}{4} + \frac{5595045221997}{8}\right)\left(-\frac{428162326383\sqrt{2}}{2} + \frac{1255552000131}{4}\right)\text{atanh}\left(\frac{8\sqrt{341}\left(x\left(-\frac{9760928569755\sqrt{2}}{8} + \frac{13926811917513}{8}\right) - \frac{2082941673879\sqrt{2}}{4}\right)}{31317099\sqrt{-13874275807943+9819738650000\sqrt{2}}}\right)}{593518446705643434228\sqrt{-13874275807943 + 9819738650000\sqrt{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubu_integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)`

[Out] $-\left(-\frac{4331517223*x}{2} + \frac{5795098133}{4}\right)/(313254502264*\sqrt{2*x^2 - x + 3}) + (715*x + 44)/(15004*\sqrt{2*x^2 - x + 3}*(5*x^2 + 3*x + 2)^2) + (10475575*x/2 + 2213695)/(112560008*\sqrt{2*x^2 - x + 3}*(5*x^2 + 3*x + 2)) + \sqrt{682}*(5595045221997/8 + 2082941673879*\sqrt{2}/4)*(428162326383*\sqrt{2}/2 + 1255552000131/4)*\text{atan}(8*\sqrt{341}*(x*(9760928569755*\sqrt{2}/8 + 13926811917513/8) + 5595045221997/8 + 2082941673879*\sqrt{2}/4)/(31317099*\sqrt{13874275807943 + 9819738650000*\sqrt{2}}*\sqrt{2*x^2 - x + 3}))/593518446705643434228*\sqrt{13874275807943 + 9819738650000*\sqrt{2}} + \sqrt{682}*(-2082941673879*\sqrt{2}/4 + 5595045221997/8)*(-428162326383*\sqrt{2}/2 + 1255552000131/4)*\text{atanh}(8*\sqrt{341}*(x*(-9760928569755*\sqrt{2}/8 + 13926811917513/8) - 2082941673879*\sqrt{2}/4 + 5595045221997/8)/(31317099*\sqrt{-13874275807943 + 9819738650000*\sqrt{2}}*\sqrt{2*x^2 - x + 3}))/593518446705643434228*\sqrt{-13874275807943 + 9819738650000*\sqrt{2}})$

Mathematica [C] time = 6.50056, size = 1191, normalized size = 4.84

result too large to display

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3),x]

[Out] Sqrt[3 - x + 2*x^2]*((-11 + 90*x)/(122452*(3 - x + 2*x^2)) + (-98 + 345*x)/(30008*(2 + 3*x + 5*x^2)^2) + (231418 + 632255*x)/(40930912*(2 + 3*x + 5*x^2))) - (((15*I)/81861824)*(-1932419*I + 79037*Sqrt[31])*ArcTan[(31*(4059546477574*I + 3106527877794*Sqrt[31] - (18544569435542*I)*x + 1227936189854*Sqrt[31]*x + (17501774027535*I)*x^2 + 1728828684066*Sqrt[31]*x^2 - (18989790004560*I)*x^3 + 1371533012850*Sqrt[31]*x^3 + (5399410180693*I)*x^4 + 274861284236*Sqrt[31]*x^4)]/(148573472722818 + (30402744893338*I)*Sqrt[31] + 862374952340638*x - (64577765937354*I)*Sqrt[31]*x + 107573401361602*x^2 - (186540875521455*I)*Sqrt[31]*x^2 + 503769328622450*x^3 - (71509340960720*I)*Sqrt[31]*x^3 + 208327267086092*x^4 - (165714245597909*I)*Sqrt[31]*x^4 - (785579092000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (1963947730000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (2749526822000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (7855790920000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])]/Sqrt[682*(13 + I*Sqrt[31])]) - (((15*I)/81861824)*(1932419*I + 79037*Sqrt[31])*ArcTan[(-148573472722818*I - 30402744893338*Sqrt[31] - (862374952340638*I)*x + 64577765937354*Sqrt[31]*x - (107573401361602*I)*x^2 + 186540875521455*Sqrt[31]*x^2 - (503769328622450*I)*x^3 + 71509340960720*Sqrt[31]*x^3 - (208327267086092*I)*x^4 + 165714245597909*Sqrt[31]*x^4 - 49491482796000*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 56954484170000*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 97804596954000*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 43206850060000*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2)]/(1445312243195206*I + 96302364211614*Sqrt[31] + (1745394499581802*I)*x + 38066021885474*Sqrt[31]*x + (1990937576846415*I)*x^2 + 53593689206046*Sqrt[31]*x^2 - (1799476949538640*I)*x^3 + 42517523398350*Sqrt[31]*x^3 + (794952672098517*I)*x^4 + 8520699811316*Sqrt[31]*x^4)]/Sqrt[682*(-13 + I*Sqrt[31])]) - (15*(-1932419*I + 79037*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2]/(163723648*Sqrt[682*(13 + I*Sqrt[31])]) + (((15*I)/163723648)*(1932419*I + 79037*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[31])]) - (((15*I)/163723648)*(1932419*I + 79037*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])]/Sqrt[682*(-13 + I*Sqrt[31])]) + (15*(-1932419*I + 79037*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])]/(163723648*Sqrt[682*(13 + I*Sqrt[31])])

Maple [B] time = 0.195, size = 18844, normalized size = 76.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^(3/2)/(5*x^2+3*x+2)^3,x)`

[Out] result too large to display

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

$$\int \frac{1}{(5x^2 + 3x + 2)^3(2x^2 - x + 3)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)),x, algorithm="maxima")`

[Out] `integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)), x)`

Fricas [A] time = 0.384355, size = 1777, normalized size = 7.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)),x, algorithm="fricas")`

[Out] `1/213269923212397897605928960*sqrt(1963947730)*930248^(3/4)*sqrt(31)*(4*sqrt(1963947730)*930248^(1/4)*sqrt(31)*(31956699540070450000*x^5 + 1697074826958606500000*x^4 + 5443430205764530200000*x^3 + 3453272041788973500000*x^2 - 13874275807943*sqrt(2)*(162716650*x^5 + 86411405*x^4 + 277167774*x^3 + 175833195*x^2 + 161806828*x + 22374044) + 3177801525491004400000*x + 439414529247201200000)*sqrt(2*x^2 - x + 3)*sqrt((13874275807943*sqrt(2) - 19639477300000)/(272483524784035708193900000*sqrt(2) - 385350063503480030421891249)) - 920746859815884*sqrt(981973865)*sqrt(2)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*arctan(30441189815*(sqrt(1963947730)*930248^(1/4)*(13874275807943*sqrt(2)*(x - 6) - 1963`

$$\begin{aligned}
& 9477300000*x + 117836863800000)*\sqrt{((13874275807943*\sqrt{2}) - 19} \\
& 639477300000)/(272483524784035708193900000*\sqrt{2}) - 385350063503} \\
& 480030421891249)) + 88*\sqrt{981973865)*\sqrt{2*x^2 - x + 3}*(41237} \\
& 02*\sqrt{2}) - 5538393))/(2*\sqrt{1963947730)*\sqrt{981973865)*930248} \\
& ^{(1/4)*\sqrt{31}*(13874275807943*\sqrt{2)*x - 19639477300000*x)*\sqrt{}} \\
& t(-\sqrt{2}*(\sqrt{1963947730)*\sqrt{981973865)*930248^{(1/4)*\sqrt{2}*} \\
& x^2 - x + 3}*(\sqrt{2}*(936607088636538063115597939162658623556607} \\
& 71809*x + 38795535873667985168681098799008433333711733825) - 1324} \\
& 56244737321791480240892715274295689372505634*x - 5486517298998582} \\
& 1142878695117257429021949037984)*\sqrt{((13874275807943*\sqrt{2}) - 1} \\
& 9639477300000)/(272483524784035708193900000*\sqrt{2}) - 38535006350} \\
& 3480030421891249)) + 26147224984581927825184989576432422662399263} \\
& 44000000*x^2 + 981973865*\sqrt{2}*(7413257518572475539044563303472} \\
& 09711900000*x^2 - 10697887063275688449737374476343556390807*\sqrt{2} \\
&)*(49*x^2 - 151*x + 200) - 2284493643478456747746385834335278908} \\
& 100000*x + 3025819395335704301650842164682488620000000) - 9244440} \\
& 04603532806582153170754894116049505622796840*\sqrt{2}*(2*x^2 - x +} \\
& 3) - 1307361249229096391259249478821621133119963172000000*x + 39} \\
& 22083747687289173777748436464863399359889516000000)/(106978870632} \\
& 75688449737374476343556390807*\sqrt{2)*x^2 - 151290969766785215082} \\
& 54210823412443100000*x^2))*\sqrt{((13874275807943*\sqrt{2}) - 1963947} \\
& 7300000)/(272483524784035708193900000*\sqrt{2}) - 38535006350348003} \\
& 0421891249)) + 981973865*\sqrt{1963947730)*930248^{(1/4)*\sqrt{31}*(} \\
& 13874275807943*\sqrt{2}*(19*x - 22) - 373150068700000*x + 43206850} \\
& 0600000)*\sqrt{((13874275807943*\sqrt{2}) - 19639477300000)/(27248352} \\
& 4784035708193900000*\sqrt{2}) - 385350063503480030421891249)) - 267} \\
& 8824703720*\sqrt{981973865)*\sqrt{31)*\sqrt{2*x^2 - x + 3}*(847654*s} \\
& \sqrt{2}) - 1242839)) - 920746859815884*\sqrt{981973865)*\sqrt{2}*(50} \\
& *x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*\arctan(-30} \\
& 441189815*(\sqrt{1963947730)*930248^{(1/4)*\sqrt{31}*(13874275807943*\sqrt{2}*} \\
& (x - 6) - 19639477300000*x + 117836863800000)*\sqrt{((1387427580794} \\
& 3*\sqrt{2}) - 19639477300000)/(272483524784035708193900000*\sqrt{2})} \\
& - 385350063503480030421891249)) - 88*\sqrt{981973865)*\sqrt{2*x^2 -} \\
& x + 3}*(4123702*\sqrt{2}) - 5538393))/(2*\sqrt{1963947730)*\sqrt{981} \\
& 973865)*930248^{(1/4)*\sqrt{31}*(13874275807943*\sqrt{2)*x - 1963947} \\
& 7300000*x)*\sqrt{(\sqrt{2}*(\sqrt{1963947730)*\sqrt{981973865)*930248^{(1/4)*\sqrt{2}*} \\
& (1/4)*\sqrt{2*x^2 - x + 3}*(\sqrt{2}*(93660708863653806311559793916} \\
& 265862355660771809*x + 387955358736679851686810987990084333337117} \\
& 33825) - 132456244737321791480240892715274295689372505634*x - 548} \\
& 65172989985821142878695117257429021949037984)*\sqrt{((1387427580794} \\
& 3*\sqrt{2}) - 19639477300000)/(272483524784035708193900000*\sqrt{2})} \\
& - 385350063503480030421891249)) - 2614722498458192782518498957643} \\
& 242266239926344000000*x^2 - 981973865*\sqrt{2}*(741325751857247553} \\
& 904456330347209711900000*x^2 - 1069788706327568844973737447634355} \\
& 6390807*\sqrt{2}*(49*x^2 - 151*x + 200) - 228449364347845674774638} \\
& 5834335278908100000*x + 30258193953357043016508421646824886200000} \\
& 00) + 924444004603532806582153170754894116049505622796840*\sqrt{2} \\
& *(2*x^2 - x + 3) + 1307361249229096391259249478821621133119963172} \\
& 000000*x - 3922083747687289173777748436464863399359889516000000)/ \\
& (10697887063275688449737374476343556390807*\sqrt{2)*x^2 - 15129096} \\
& 976678521508254210823412443100000*x^2))*\sqrt{((13874275807943*\sqrt{2})} \\
& (2) - 19639477300000)/(272483524784035708193900000*\sqrt{2}) - 3853} \\
& 50063503480030421891249)) + 981973865*\sqrt{1963947730)*930248^{(1/} \\
& 4)*\sqrt{31}*(13874275807943*\sqrt{2}*(19*x - 22) - 373150068700000
\end{aligned}$$

$$\begin{aligned}
& *x + 432068500600000) * \sqrt{((13874275807943 * \sqrt{2}) - 196394773000 \\
& 00)/(272483524784035708193900000 * \sqrt{2}) - 3853500635034800304218 \\
& 91249)) + 2678824703720 * \sqrt{981973865} * \sqrt{31} * \sqrt{2 * x^2 - x + \\
& 3} * (847654 * \sqrt{2}) - 1242839)) + 69 * \sqrt{981973865} * \sqrt{31} * (9 \\
& 81973865000000 * x^6 + 687381705500000 * x^5 + 2022866161900000 * x^4 + \\
& 1669355570500000 * x^3 + 1630076615900000 * x^2 - 13874275807943 * \sqrt{2} * \\
& (50 * x^6 + 35 * x^5 + 103 * x^4 + 85 * x^3 + 83 * x^2 + 32 * x + 12) + \\
& 628463273600000 * x + 235673727600000) * \log(-13809007476562500 * \sqrt{2} * \\
& (\sqrt{2} * (\sqrt{1963947730} * \sqrt{981973865}) * 930248^{(1/4)} * \sqrt{2 * x^2 - x \\
& + 3}) * (\sqrt{2} * (93660708863653806311559793916265862355660771809 * x \\
& + 38795535873667985168681098799008433333711733825) - 132456244737 \\
& 321791480240892715274295689372505634 * x - 548651729899858211428786 \\
& 95117257429021949037984) * \sqrt{((13874275807943 * \sqrt{2}) - 196394773 \\
& 00000)/(272483524784035708193900000 * \sqrt{2}) - 3853500635034800304 \\
& 21891249)) + 2614722498458192782518498957643242266239926344000000 \\
& * x^2 + 981973865 * \sqrt{2} * (741325751857247553904456330347209711900 \\
& 000 * x^2 - 10697887063275688449737374476343556390807 * \sqrt{2} * (49 * x \\
& ^2 - 151 * x + 200) - 2284493643478456747746385834335278908100000 * x \\
& + 3025819395335704301650842164682488620000000) - 924444004603532 \\
& 806582153170754894116049505622796840 * \sqrt{2} * (2 * x^2 - x + 3) - 13 \\
& 07361249229096391259249478821621133119963172000000 * x + 3922083747 \\
& 687289173777748436464863399359889516000000)/(10697887063275688449 \\
& 737374476343556390807 * \sqrt{2} * x^2 - 15129096976678521508254210823 \\
& 412443100000 * x^2)) - 69 * \sqrt{981973865} * \sqrt{31} * (981973865000000 \\
& * x^6 + 687381705500000 * x^5 + 2022866161900000 * x^4 + 1669355570500 \\
& 000 * x^3 + 1630076615900000 * x^2 - 13874275807943 * \sqrt{2} * (50 * x^6 + \\
& 35 * x^5 + 103 * x^4 + 85 * x^3 + 83 * x^2 + 32 * x + 12) + 62846327360000 \\
& 0 * x + 235673727600000) * \log(13809007476562500 * \sqrt{2} * (\sqrt{2} * (\sqrt{196394 \\
& 7730} * \sqrt{981973865}) * 930248^{(1/4)} * \sqrt{2 * x^2 - x + 3}) * (\sqrt{2} * (\\
& 93660708863653806311559793916265862355660771809 * x + 3879553587366 \\
& 7985168681098799008433333711733825) - 132456244737321791480240892 \\
& 715274295689372505634 * x - 548651729899858211428786951172574290219 \\
& 49037984) * \sqrt{((13874275807943 * \sqrt{2}) - 19639477300000)/(2724835 \\
& 24784035708193900000 * \sqrt{2}) - 385350063503480030421891249)) - 26 \\
& 14722498458192782518498957643242266239926344000000 * x^2 - 98197386 \\
& 5 * \sqrt{2} * (741325751857247553904456330347209711900000 * x^2 - 10697 \\
& 887063275688449737374476343556390807 * \sqrt{2} * (49 * x^2 - 151 * x + 20 \\
& 0) - 2284493643478456747746385834335278908100000 * x + 302581939533 \\
& 5704301650842164682488620000000) + 924444004603532806582153170754 \\
& 894116049505622796840 * \sqrt{2} * (2 * x^2 - x + 3) + 13073612492290963 \\
& 91259249478821621133119963172000000 * x - 3922083747687289173777748 \\
& 436464863399359889516000000)/(10697887063275688449737374476343556 \\
& 390807 * \sqrt{2} * x^2 - 15129096976678521508254210823412443100000 * x^2 \\
& 2)))/((981973865000000 * x^6 + 687381705500000 * x^5 + 20228661619000 \\
& 00 * x^4 + 1669355570500000 * x^3 + 1630076615900000 * x^2 - 1387427580 \\
& 7943 * \sqrt{2} * (50 * x^6 + 35 * x^5 + 103 * x^4 + 85 * x^3 + 83 * x^2 + 32 * x \\
& + 12) + 628463273600000 * x + 235673727600000) * \sqrt{((13874275807943 \\
& * \sqrt{2}) - 19639477300000)/(272483524784035708193900000 * \sqrt{2}) - \\
& 385350063503480030421891249))
\end{aligned}$$

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)`

[Out] `Integral(1/((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**3), x)`

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)),x, algorithm="giac")`

[Out] `Exception raised: RuntimeError`

$$3.93 \quad \int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^{5/2}} dx$$

Optimal. Leaf size=147

$$\begin{aligned} & \frac{38375}{384} \sqrt{2x^2 - x + 3x^2} + \frac{526075\sqrt{2x^2 - x + 3x}}{3072} - \frac{1308645\sqrt{2x^2 - x + 3}}{4096} + \frac{1331(116368x + 7409)}{101568\sqrt{2x^2 - x + 3}} \\ & - \frac{14641(79x + 101)}{4416(2x^2 - x + 3)^{3/2}} + \frac{625}{32} \sqrt{2x^2 - x + 3x^3} + \frac{16955197 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8192\sqrt{2}} \end{aligned}$$

[Out] (-14641*(101 + 79*x))/(4416*(3 - x + 2*x^2)^(3/2)) + (1331*(7409 + 116368*x))/(101568*sqrt[3 - x + 2*x^2]) - (1308645*sqrt[3 - x + 2*x^2])/4096 + (526075*x*sqrt[3 - x + 2*x^2])/3072 + (38375*x^2*sqrt[3 - x + 2*x^2])/384 + (625*x^3*sqrt[3 - x + 2*x^2])/32 + (16955197*ArcSinh[(1 - 4*x)/sqrt[23]])/(8192*sqrt[2])

Rubi [A] time = 0.278346, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{38375}{384} \sqrt{2x^2 - x + 3x^2} + \frac{526075\sqrt{2x^2 - x + 3x}}{3072} - \frac{1308645\sqrt{2x^2 - x + 3}}{4096} + \frac{1331(116368x + 7409)}{101568\sqrt{2x^2 - x + 3}} \\ & - \frac{14641(79x + 101)}{4416(2x^2 - x + 3)^{3/2}} + \frac{625}{32} \sqrt{2x^2 - x + 3x^3} + \frac{16955197 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8192\sqrt{2}} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(5/2), x]

[Out] (-14641*(101 + 79*x))/(4416*(3 - x + 2*x^2)^(3/2)) + (1331*(7409 + 116368*x))/(101568*sqrt[3 - x + 2*x^2]) - (1308645*sqrt[3 - x + 2*x^2])/4096 + (526075*x*sqrt[3 - x + 2*x^2])/3072 + (38375*x^2*sqrt[3 - x + 2*x^2])/384 + (625*x^3*sqrt[3 - x + 2*x^2])/32 + (16955197*ArcSinh[(1 - 4*x)/sqrt[23]])/(8192*sqrt[2])

Rubi in Sympy [A] time = 98.319, size = 180, normalized size = 1.22

$$\begin{aligned}
 & - \frac{\left(-\frac{778938699375x}{2} + \frac{3520397050875}{8}\right) \sqrt{2x^2 - x + 3}}{914112000} - \frac{2(-4x + 1)(5x^2 + 3x + 2)^4}{69(2x^2 - x + 3)^{\frac{3}{2}}} \\
 & + \frac{2(1576x + 112)(5x^2 + 3x + 2)^3}{1587\sqrt{2x^2 - x + 3}} - \frac{(2709000x + 3441150)\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)^2}{476100} \\
 & + \frac{(1966983750x + \frac{21212629875}{2})\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)}{114264000} - \frac{16955197\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{16384}
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(5/2),x)`

[Out] `-(-778938699375*x/2 + 3520397050875/8)*sqrt(2*x**2 - x + 3)/914112000 - 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**4/(69*(2*x**2 - x + 3)**(3/2)) + 2*(1576*x + 112)*(5*x**2 + 3*x + 2)**3/(1587*sqrt(2*x**2 - x + 3)) - (2709000*x + 3441150)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2/476100 + (1966983750*x + 21212629875/2)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/114264000 - 16955197*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/16384`

Mathematica [A] time = 0.15485, size = 75, normalized size = 0.51

$$\begin{aligned}
 & \frac{507840000x^7 + 2090608000x^6 + 3504730800x^5 - 5076781260x^4 + 39848900984x^3 - 36481630395x^2 + 49883864262x - 189}{6500352(2x^2 - x + 3)^{3/2}} \\
 & - \frac{16955197 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{8192\sqrt{2}}
 \end{aligned}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(5/2),x]`

[Out] `(-18974698519 + 49883864262*x - 36481630395*x^2 + 39848900984*x^3 - 5076781260*x^4 + 3504730800*x^5 + 2090608000*x^6 + 507840000*x^7)/(6500352*(3 - x + 2*x^2)^(3/2)) - (16955197*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(8192*Sqrt[2])`

Maple [A] time = 0.043, size = 214, normalized size = 1.5

$$\begin{aligned} & \frac{16955197}{32768} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{2149616639}{524288} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & - \frac{16955197\sqrt{2}}{16384} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{20566450900x - 5141612725}{36175872} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & + \frac{3971704132x - 992926033}{13000704} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{138025x^5}{256} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & - \frac{799745x^4}{1024} (2x^2 - x + 3)^{-\frac{3}{2}} + \frac{16955197x^3}{12288} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & - \frac{67488035x^2}{16384} (2x^2 - x + 3)^{-\frac{3}{2}} + \frac{55167267x}{131072} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & + \frac{625x^7}{8} (2x^2 - x + 3)^{-\frac{3}{2}} + \frac{30875x^6}{96} (2x^2 - x + 3)^{-\frac{3}{2}} + \frac{16955197x}{8192} \frac{1}{\sqrt{2x^2 - x + 3}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^4/(2*x^2-x+3)^(5/2),x)`

[Out] $16955197/32768/(2*x^2-x+3)^(1/2)-2149616639/524288/(2*x^2-x+3)^(3/2)-16955197/16384*2^(1/2)*\operatorname{arcsinh}(4/23*23^(1/2)*(x-1/4))+5141612725/36175872*(4*x-1)/(2*x^2-x+3)^(3/2)+992926033/13000704*(4*x-1)/(2*x^2-x+3)^(1/2)+138025/256*x^5/(2*x^2-x+3)^(3/2)-799745/1024*x^4/(2*x^2-x+3)^(3/2)+16955197/12288*x^3/(2*x^2-x+3)^(3/2)-67488035/16384*x^2/(2*x^2-x+3)^(3/2)+55167267/131072*x/(2*x^2-x+3)^(3/2)+625/8*x^7/(2*x^2-x+3)^(3/2)+30875/96*x^6/(2*x^2-x+3)^(3/2)+16955197/8192*x/(2*x^2-x+3)^(1/2)$

Maxima [A] time = 0.79172, size = 342, normalized size = 2.33

$$\begin{aligned} & \frac{625x^7}{8(2x^2 - x + 3)^{\frac{3}{2}}} + \frac{30875x^6}{96(2x^2 - x + 3)^{\frac{3}{2}}} + \frac{138025x^5}{256(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{799745x^4}{1024(2x^2 - x + 3)^{\frac{3}{2}}} \\ & - \frac{16955197}{13000704} x \left(\frac{284x}{\sqrt{2x^2 - x + 3}} - \frac{3174x^2}{(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{71}{\sqrt{2x^2 - x + 3}} + \frac{805x}{(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{3243}{(2x^2 - x + 3)^{\frac{3}{2}}} \right) \\ & - \frac{16955197}{16384} \sqrt{2} \operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) + \frac{1203818987}{6500352} \sqrt{2x^2 - x + 3} + \frac{3536205583x}{3250176\sqrt{2x^2 - x + 3}} \\ & - \frac{2638851x^2}{512(2x^2 - x + 3)^{\frac{3}{2}}} + \frac{257773037}{1083392\sqrt{2x^2 - x + 3}} + \frac{29484067x}{23552(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{374445479}{70656(2x^2 - x + 3)^{\frac{3}{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")`

```
[Out] 625/8*x^7/(2*x^2 - x + 3)^(3/2) + 30875/96*x^6/(2*x^2 - x + 3)^(3/2) + 138025/256*x^5/(2*x^2 - x + 3)^(3/2) - 799745/1024*x^4/(2*x^2 - x + 3)^(3/2) - 16955197/13000704*x*(284*x/sqrt(2*x^2 - x + 3) - 3174*x^2/(2*x^2 - x + 3)^(3/2) - 71/sqrt(2*x^2 - x + 3) + 805*x/(2*x^2 - x + 3)^(3/2) - 3243/(2*x^2 - x + 3)^(3/2)) - 16955197/16384*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) + 1203818987/6500352*sqrt(2*x^2 - x + 3) + 3536205583/3250176*x/sqrt(2*x^2 - x + 3) - 2638851/512*x^2/(2*x^2 - x + 3)^(3/2) + 257773037/1083392/sqrt(2*x^2 - x + 3) + 29484067/23552*x/(2*x^2 - x + 3)^(3/2) - 374445479/70656/(2*x^2 - x + 3)^(3/2)
```

Fricas [A] time = 0.291338, size = 186, normalized size = 1.27

$$\sqrt{2} \left(4 \sqrt{2} (507840000 x^7 + 2090608000 x^6 + 3504730800 x^5 - 5076781260 x^4 + 39848900984 x^3 - 36481630395 x^2 + 49883864262 x - 18974698519) \sqrt{2x^2 - x + 3} + 26907897639 (4x^4 - 4x^3 + 13x^2 - 6x + 9) \log(-\sqrt{2} (32x^2 - 16x + 25) + 8\sqrt{2x^2 - x + 3} (4x - 1)) \right) / (4x^4 - 4x^3 + 13x^2 - 6x + 9)$$

52002816

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(5/2), x, algorithm="fricas")
```

```
[Out] 1/52002816*sqrt(2)*(4*sqrt(2)*(507840000*x^7 + 2090608000*x^6 + 3504730800*x^5 - 5076781260*x^4 + 39848900984*x^3 - 36481630395*x^2 + 49883864262*x - 18974698519)*sqrt(2*x^2 - x + 3) + 26907897639*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)
```

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

$$\int \frac{(5x^2 + 3x + 2)^4}{(2x^2 - x + 3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(5/2), x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**4/(2*x**2 - x + 3)**(5/2), x)
```

GIAC/XCAS [A] time = 0.27356, size = 109, normalized size = 0.74

$$\frac{16955197}{16384} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right) + \frac{((4(2645(20(40(60x + 247)x + 16563)x - 479847)x + 9962225246)x - 36481630395)x + 49883864262)x - 18974698519)}{6500352(2x^2 - x + 3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(5/2),x, algorithm="giac")

[Out] 16955197/16384*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1) + 1/6500352*(((4*(2645*(20*(40*(60*x + 247)*x + 16563)*x - 479847)*x + 9962225246)*x - 36481630395)*x + 49883864262)*x - 18974698519)/(2*x^2 - x + 3)^(3/2)

$$3.94 \quad \int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^{5/2}} dx$$

Optimal. Leaf size=105

$$\frac{121(10679 - 6744x)}{8464\sqrt{2x^2 - x + 3}} + \frac{125}{16}x\sqrt{2x^2 - x + 3} + \frac{3175}{64}\sqrt{2x^2 - x + 3} - \frac{1331(17 - 45x)}{1104(2x^2 - x + 3)^{3/2}} - \frac{7495 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{128\sqrt{2}}$$

[Out] (-1331*(17 - 45*x))/(1104*(3 - x + 2*x^2)^(3/2)) + (121*(10679 - 6744*x))/(8464*sqrt[3 - x + 2*x^2]) + (3175*sqrt[3 - x + 2*x^2])/64 + (125*x*sqrt[3 - x + 2*x^2])/16 - (7495*ArcSinh[(1 - 4*x)/sqrt[23]])/(128*sqrt[2])

Rubi [A] time = 0.176466, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{121(10679 - 6744x)}{8464\sqrt{2x^2 - x + 3}} + \frac{125}{16}x\sqrt{2x^2 - x + 3} + \frac{3175}{64}\sqrt{2x^2 - x + 3} - \frac{1331(17 - 45x)}{1104(2x^2 - x + 3)^{3/2}} - \frac{7495 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{128\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(5/2), x]

[Out] (-1331*(17 - 45*x))/(1104*(3 - x + 2*x^2)^(3/2)) + (121*(10679 - 6744*x))/(8464*sqrt[3 - x + 2*x^2]) + (3175*sqrt[3 - x + 2*x^2])/64 + (125*x*sqrt[3 - x + 2*x^2])/16 - (7495*ArcSinh[(1 - 4*x)/sqrt[23]])/(128*sqrt[2])

Rubi in Sympy [A] time = 72.9896, size = 144, normalized size = 1.37

$$\begin{aligned} & -\frac{2(-1116x + 26)(5x^2 + 3x + 2)^2}{1587\sqrt{2x^2 - x + 3}} - \frac{2(-4x + 1)(5x^2 + 3x + 2)^3}{69(2x^2 - x + 3)^{3/2}} \\ & - \frac{(807600x + 990060)\sqrt{2x^2 - x + 3}(5x^2 + 3x + 2)}{190440} \\ & + \frac{(29748900x + 165587715)\sqrt{2x^2 - x + 3}}{1523520} + \frac{7495\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{256} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(5/2),x)`

[Out] $-2*(-1116*x + 26)*(5*x**2 + 3*x + 2)**2/(1587*\sqrt{2*x**2 - x + 3}) - 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**3/(69*(2*x**2 - x + 3)**(3/2)) - (807600*x + 990060)*\sqrt{2*x**2 - x + 3}*(5*x**2 + 3*x + 2)/190440 + (29748900*x + 165587715)*\sqrt{2*x**2 - x + 3}/1523520 + 7495*\sqrt{2}*\operatorname{atanh}(\sqrt{2}*(4*x - 1)/(4*\sqrt{2*x**2 - x + 3}))/256$

Mathematica [A] time = 0.11998, size = 65, normalized size = 0.62

$$\frac{3174000x^5 + 16980900x^4 - 29423976x^3 + 101546529x^2 - 62463282x + 89784565}{101568(2x^2 - x + 3)^{3/2}} + \frac{7495 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{128\sqrt{2}}$$

Antiderivative was successfully verified.

[In] `Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(5/2),x]`

[Out] $(89784565 - 62463282*x + 101546529*x^2 - 29423976*x^3 + 16980900*x^4 + 3174000*x^5)/(101568*(3 - x + 2*x^2)^{(3/2)}) + (7495*\operatorname{ArcSinh}((-1 + 4*x)/\sqrt{23}))/128*\sqrt{2}$

Maple [B] time = 0.01, size = 180, normalized size = 1.7

$$\begin{aligned} & -\frac{56326844x - 14081711}{565248}(2x^2 - x + 3)^{-\frac{3}{2}} - \frac{13564556x - 3391139}{203136} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & + \frac{20961031}{24576}(2x^2 - x + 3)^{-\frac{3}{2}} - \frac{281177x}{2048}(2x^2 - x + 3)^{-\frac{3}{2}} + \frac{222809x^2}{256}(2x^2 - x + 3)^{-\frac{3}{2}} \\ & - \frac{7495x^3}{192}(2x^2 - x + 3)^{-\frac{3}{2}} - \frac{7495x}{128} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{7495}{512} \frac{1}{\sqrt{2x^2 - x + 3}} \\ & + \frac{7495\sqrt{2}}{256} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) + \frac{2675x^4}{16}(2x^2 - x + 3)^{-\frac{3}{2}} + \frac{125x^5}{4}(2x^2 - x + 3)^{-\frac{3}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((5*x^2+3*x+2)^3/(2*x^2-x+3)^(5/2),x)`

[Out] $-14081711/565248*(4*x-1)/(2*x^2-x+3)^{(3/2)} - 3391139/203136*(4*x-1)/(2*x^2-x+3)^{(1/2)} + 20961031/24576/(2*x^2-x+3)^{(3/2)} - 281177/2048*x/(2*x^2-x+3)^{(3/2)} + 222809/256*x^2/(2*x^2-x+3)^{(3/2)} - 7495/192*x^3/(2*x^2-x+3)^{(3/2)} - 7495/128*x/(2*x^2-x+3)^{(1/2)} - 7495/512/(2*x^2-x+3)^{(1/2)} + 2675*x^4/16*(2*x^2-x+3)^{-3/2} + 125*x^5/4*(2*x^2-x+3)^{-3/2}$

$$3)^{(1/2)}+7495/256*2^{(1/2)}*\operatorname{arcsinh}(4/23*23^{(1/2)}*(x-1/4))+2675/16*x^4/(2*x^2-x+3)^{(3/2)}+125/4*x^5/(2*x^2-x+3)^{(3/2)}$$

Maxima [A] time = 0.77999, size = 296, normalized size = 2.82

$$\begin{aligned} & \frac{125x^5}{4(2x^2-x+3)^{\frac{3}{2}}} + \frac{2675x^4}{16(2x^2-x+3)^{\frac{3}{2}}} \\ & + \frac{7495}{203136}x \left(\frac{284x}{\sqrt{2x^2-x+3}} - \frac{3174x^2}{(2x^2-x+3)^{\frac{3}{2}}} - \frac{71}{\sqrt{2x^2-x+3}} + \frac{805x}{(2x^2-x+3)^{\frac{3}{2}}} - \frac{3243}{(2x^2-x+3)^{\frac{3}{2}}} \right) \\ & + \frac{7495}{256}\sqrt{2}\operatorname{arcsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) - \frac{532145}{101568}\sqrt{2x^2-x+3} - \frac{4515389x}{50784\sqrt{2x^2-x+3}} \\ & + \frac{7197x^2}{8(2x^2-x+3)^{\frac{3}{2}}} + \frac{396211}{50784\sqrt{2x^2-x+3}} - \frac{269783x}{1104(2x^2-x+3)^{\frac{3}{2}}} + \frac{1002137}{1104(2x^2-x+3)^{\frac{3}{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")

[Out] 125/4*x^5/(2*x^2 - x + 3)^(3/2) + 2675/16*x^4/(2*x^2 - x + 3)^(3/2) + 7495/203136*x*(284*x/sqrt(2*x^2 - x + 3) - 3174*x^2/(2*x^2 - x + 3)^(3/2) - 71/sqrt(2*x^2 - x + 3) + 805*x/(2*x^2 - x + 3)^(3/2) - 3243/(2*x^2 - x + 3)^(3/2)) + 7495/256*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 532145/101568*sqrt(2*x^2 - x + 3) - 4515389/50784*x/sqrt(2*x^2 - x + 3) + 7197/8*x^2/(2*x^2 - x + 3)^(3/2) + 396211/50784/sqrt(2*x^2 - x + 3) - 269783/1104*x/(2*x^2 - x + 3)^(3/2) + 1002137/1104/(2*x^2 - x + 3)^(3/2)

Fricas [A] time = 0.288325, size = 173, normalized size = 1.65

$$\frac{\sqrt{2}\left(4\sqrt{2}(3174000x^5 + 16980900x^4 - 29423976x^3 + 101546529x^2 - 62463282x + 89784565)\sqrt{2x^2-x+3} + 11894565(4x^4 - 4x^3 + 13x^2 - 6x + 9)\right)}{812544(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")

[Out] 1/812544*sqrt(2)*(4*sqrt(2)*(3174000*x^5 + 16980900*x^4 - 29423976*x^3 + 101546529*x^2 - 62463282*x + 89784565)*sqrt(2*x^2 - x + 3) + 11894565*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

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

$$\int \frac{(5x^2 + 3x + 2)^3}{(2x^2 - x + 3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(5/2), x)

[Out] Integral((5*x**2 + 3*x + 2)**3/(2*x**2 - x + 3)**(5/2), x)

GIAC/XCAS [A] time = 0.274439, size = 97, normalized size = 0.92

$$-\frac{7495}{256} \sqrt{2} \ln \left(-2 \sqrt{2} \left(\sqrt{2}x - \sqrt{2x^2 - x + 3} \right) + 1 \right) + \frac{3((4(13225(20x + 107)x - 2451998)x + 33848843)x - 20821094)x + 89784565}{101568(2x^2 - x + 3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(5/2), x, algorithm="giac")

[Out] -7495/256*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1) + 1/101568*(3*((4*(13225*(20*x + 107)*x - 2451998)*x + 33848843)*x - 20821094)*x + 89784565)/(2*x^2 - x + 3)^(3/2)

$$3.95 \quad \int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^{5/2}} dx$$

Optimal. Leaf size=68

$$\frac{121(19-7x)}{276(2x^2-x+3)^{3/2}} - \frac{11(2336x+7351)}{6348\sqrt{2x^2-x+3}} - \frac{25 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{2}}$$

[Out] (121*(19 - 7*x))/(276*(3 - x + 2*x^2)^(3/2)) - (11*(7351 + 2336*x))/(6348*Sqrt[3 - x + 2*x^2]) - (25*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4*Sqrt[2])

Rubi [A] time = 0.101411, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{121(19-7x)}{276(2x^2-x+3)^{3/2}} - \frac{11(2336x+7351)}{6348\sqrt{2x^2-x+3}} - \frac{25 \sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{2}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(5/2), x]

[Out] (121*(19 - 7*x))/(276*(3 - x + 2*x^2)^(3/2)) - (11*(7351 + 2336*x))/(6348*Sqrt[3 - x + 2*x^2]) - (25*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4*Sqrt[2])

Rubi in Sympy [A] time = 44.8875, size = 114, normalized size = 1.68

$$\begin{aligned} & -\frac{2(-656x+164)(5x^2+3x+2)}{1587\sqrt{2x^2-x+3}} - \frac{2(-4x+1)(5x^2+3x+2)^2}{69(2x^2-x+3)^{3/2}} \\ & - \frac{(17720x+20122)\sqrt{2x^2-x+3}}{6348} + \frac{25\sqrt{2} \operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(5/2), x)

[Out] -2*(-656*x + 164)*(5*x**2 + 3*x + 2)/(1587*sqrt(2*x**2 - x + 3)) - 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**2/(69*(2*x**2 - x + 3)**(3/2))

$$- (17720x + 20122) \sqrt{2x^2 - x + 3} / 6348 + 25 \sqrt{2} \operatorname{atanh}(\sqrt{2}(4x - 1) / (4\sqrt{2x^2 - x + 3})) / 8$$

Mathematica [A] time = 0.10361, size = 55, normalized size = 0.81

$$\frac{25 \sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{4\sqrt{2}} - \frac{11(2336x^3 + 6183x^2 + 714x + 8623)}{3174(2x^2 - x + 3)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(5/2), x]

[Out] (-11*(8623 + 714*x + 6183*x^2 + 2336*x^3))/(3174*(3 - x + 2*x^2)^(3/2)) + (25*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(4*Sqrt[2])

Maple [B] time = 0.009, size = 146, normalized size = 2.2

$$\begin{aligned} & \frac{33972x - 8493}{5888} (2x^2 - x + 3)^{-\frac{3}{2}} + \frac{9068x - 2267}{2116} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{15775}{768} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & - \frac{319x}{64} (2x^2 - x + 3)^{-\frac{3}{2}} - \frac{145x^2}{8} (2x^2 - x + 3)^{-\frac{3}{2}} - \frac{25x^3}{6} (2x^2 - x + 3)^{-\frac{3}{2}} \\ & - \frac{25x}{4} \frac{1}{\sqrt{2x^2 - x + 3}} - \frac{25}{16} \frac{1}{\sqrt{2x^2 - x + 3}} + \frac{25\sqrt{2}}{8} \operatorname{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x - \frac{1}{4}\right)\right) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)^2/(2*x^2-x+3)^(5/2), x)

[Out] 8493/5888*(4*x-1)/(2*x^2-x+3)^(3/2)+2267/2116*(4*x-1)/(2*x^2-x+3)^(1/2)-15775/768/(2*x^2-x+3)^(3/2)-319/64*x/(2*x^2-x+3)^(3/2)-145/8*x^2/(2*x^2-x+3)^(3/2)-25/6*x^3/(2*x^2-x+3)^(3/2)-25/4*x/(2*x^2-x+3)^(1/2)-25/16/(2*x^2-x+3)^(1/2)+25/8*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))

Maxima [A] time = 0.779493, size = 250, normalized size = 3.68

$$\frac{25}{6348} x \left(\frac{284x}{\sqrt{2x^2 - x + 3}} - \frac{3174x^2}{(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{71}{\sqrt{2x^2 - x + 3}} + \frac{805x}{(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{3243}{(2x^2 - x + 3)^{\frac{3}{2}}} \right) + \frac{25}{8} \sqrt{2} \operatorname{arsinh} \left(\frac{1}{23} \sqrt{23}(4x - 1) \right) - \frac{1775}{3174} \sqrt{2x^2 - x + 3} + \frac{1017x}{529 \sqrt{2x^2 - x + 3}} - \frac{15x^2}{(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{6413}{3174 \sqrt{2x^2 - x + 3}} - \frac{x}{138(2x^2 - x + 3)^{\frac{3}{2}}} - \frac{2593}{138(2x^2 - x + 3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")

[Out] 25/6348*x*(284*x/sqrt(2*x^2 - x + 3) - 3174*x^2/(2*x^2 - x + 3)^(3/2) - 71/sqrt(2*x^2 - x + 3) + 805*x/(2*x^2 - x + 3)^(3/2) - 3243/(2*x^2 - x + 3)^(3/2)) + 25/8*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 1775/3174*sqrt(2*x^2 - x + 3) + 1017/529*x/sqrt(2*x^2 - x + 3) - 15*x^2/(2*x^2 - x + 3)^(3/2) - 6413/3174/sqrt(2*x^2 - x + 3) - 1/138*x/(2*x^2 - x + 3)^(3/2) - 2593/138/(2*x^2 - x + 3)^(3/2)

Fricas [A] time = 0.280794, size = 159, normalized size = 2.34

$$\frac{\sqrt{2}(44\sqrt{2}(2336x^3 + 6183x^2 + 714x + 8623)\sqrt{2x^2 - x + 3} - 39675(4x^4 - 4x^3 + 13x^2 - 6x + 9)\log(-\sqrt{2}(32x^2 - 16x + 25)))}{25392(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")

[Out] -1/25392*sqrt(2)*(44*sqrt(2)*(2336*x^3 + 6183*x^2 + 714*x + 8623)*sqrt(2*x^2 - x + 3) - 39675*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)

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

$$\int \frac{(5x^2 + 3x + 2)^2}{(2x^2 - x + 3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(5/2),x)

[Out] Integral((5*x**2 + 3*x + 2)**2/(2*x**2 - x + 3)**(5/2), x)

GIAC/XCAS [A] time = 0.27351, size = 82, normalized size = 1.21

$$-\frac{25}{8}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right) - \frac{11((2336x + 6183)x + 714)x + 8623}{3174(2x^2 - x + 3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(5/2),x, algorithm="giac")

[Out] -25/8*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1) - 11/3174*(((2336*x + 6183)*x + 714)*x + 8623)/(2*x^2 - x + 3)^(3/2)

$$3.96 \quad \int \frac{2+3x+5x^2}{(3-x+2x^2)^{5/2}} dx$$

Optimal. Leaf size=47

$$-\frac{71(1-4x)}{529\sqrt{2x^2-x+3}} - \frac{11(3x+5)}{69(2x^2-x+3)^{3/2}}$$

[Out] (-11*(5 + 3*x))/(69*(3 - x + 2*x^2)^(3/2)) - (71*(1 - 4*x))/(529*Sqrt[3 - x + 2*x^2])

Rubi [A] time = 0.0406135, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$-\frac{71(1-4x)}{529\sqrt{2x^2-x+3}} - \frac{11(3x+5)}{69(2x^2-x+3)^{3/2}}$$

Antiderivative was successfully verified.

[In] Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(5/2), x]

[Out] (-11*(5 + 3*x))/(69*(3 - x + 2*x^2)^(3/2)) - (71*(1 - 4*x))/(529*Sqrt[3 - x + 2*x^2])

Rubi in Sympy [A] time = 9.367, size = 37, normalized size = 0.79

$$-\frac{71(-8x+2)}{1058\sqrt{2x^2-x+3}} - \frac{33x+55}{69(2x^2-x+3)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(5/2), x)

[Out] -71*(-8*x + 2)/(1058*sqrt(2*x**2 - x + 3)) - (33*x + 55)/(69*(2*x**2 - x + 3)**(3/2))

Mathematica [A] time = 0.0287658, size = 33, normalized size = 0.7

$$\frac{2(852x^3 - 639x^2 + 1005x - 952)}{1587(2x^2 - x + 3)^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(5/2), x]

[Out] (2*(-952 + 1005*x - 639*x^2 + 852*x^3))/(1587*(3 - x + 2*x^2)^(3/2))

Maple [A] time = 0.005, size = 30, normalized size = 0.6

$$\frac{1704x^3 - 1278x^2 + 2010x - 1904}{1587} (2x^2 - x + 3)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((5*x^2+3*x+2)/(2*x^2-x+3)^(5/2), x)

[Out] 2/1587/(2*x^2-x+3)^(3/2)*(852*x^3-639*x^2+1005*x-952)

Maxima [A] time = 0.700173, size = 80, normalized size = 1.7

$$\frac{284x}{529\sqrt{2x^2-x+3}} - \frac{71}{529\sqrt{2x^2-x+3}} - \frac{11x}{23(2x^2-x+3)^{\frac{3}{2}}} - \frac{55}{69(2x^2-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(5/2), x, algorithm="maxima")

[Out] 284/529*x/sqrt(2*x^2 - x + 3) - 71/529/sqrt(2*x^2 - x + 3) - 11/23*x/(2*x^2 - x + 3)^(3/2) - 55/69/(2*x^2 - x + 3)^(3/2)

Fricas [A] time = 0.274511, size = 69, normalized size = 1.47

$$\frac{2(852x^3 - 639x^2 + 1005x - 952)\sqrt{2x^2 - x + 3}}{1587(4x^4 - 4x^3 + 13x^2 - 6x + 9)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(5/2), x, algorithm="fricas")

[Out] $\frac{2}{1587} (852x^3 - 639x^2 + 1005x - 952) \sqrt{2x^2 - x + 3} / (4x^4 - 4x^3 + 13x^2 - 6x + 9)$

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

$$\int \frac{5x^2 + 3x + 2}{(2x^2 - x + 3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(5/2), x)`

[Out] `Integral((5*x**2 + 3*x + 2)/(2*x**2 - x + 3)**(5/2), x)`

GIAC/XCAS [A] time = 0.270117, size = 39, normalized size = 0.83

$$\frac{2(3(71(4x-3)x+335)x-952)}{1587(2x^2-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(5/2), x, algorithm="giac")`

[Out] $\frac{2}{1587} (3(71(4x-3)x+335)x-952) / (2x^2-x+3)^{3/2}$

$$3.97 \quad \int \frac{1}{(3-x+2x^2)^{5/2}(2+3x+5x^2)} dx$$

Optimal. Leaf size=199

$$\begin{aligned} & \frac{3603 - 658x}{128018\sqrt{2x^2 - x + 3}} + \frac{13 - 6x}{759(2x^2 - x + 3)^{3/2}} \\ & + \frac{1}{484} \sqrt{\frac{1}{682} (25000\sqrt{2} - 15457)} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(25000\sqrt{2}-15457)}} \left((247 + 345\sqrt{2})x - 98\sqrt{2} + 443 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \frac{1}{484} \sqrt{\frac{1}{682} (15457 + 25000\sqrt{2})} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(15457+25000\sqrt{2})}} \left((247 - 345\sqrt{2})x + 98\sqrt{2} + 443 \right)}{\sqrt{2x^2 - x + 3}} \right) \end{aligned}$$

[Out] (13 - 6*x)/(759*(3 - x + 2*x^2)^(3/2)) + (3603 - 658*x)/(128018*Sqrt[3 - x + 2*x^2]) + (Sqrt[(-15457 + 25000*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(-15457 + 25000*Sqrt[2]))])*(443 - 98*Sqrt[2] + (247 + 345*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/484 - (Sqrt[(15457 + 25000*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(15457 + 25000*Sqrt[2]))])*(443 + 98*Sqrt[2] + (247 - 345*Sqrt[2])*x)]/Sqrt[3 - x + 2*x^2])/484

Rubi [A] time = 0.942163, antiderivative size = 199, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\begin{aligned} & \frac{3603 - 658x}{128018\sqrt{2x^2 - x + 3}} + \frac{13 - 6x}{759(2x^2 - x + 3)^{3/2}} \\ & + \frac{1}{484} \sqrt{\frac{1}{682} (25000\sqrt{2} - 15457)} \tan^{-1} \left(\frac{\sqrt{\frac{11}{31(25000\sqrt{2}-15457)}} \left((247 + 345\sqrt{2})x - 98\sqrt{2} + 443 \right)}{\sqrt{2x^2 - x + 3}} \right) \\ & - \frac{1}{484} \sqrt{\frac{1}{682} (15457 + 25000\sqrt{2})} \tanh^{-1} \left(\frac{\sqrt{\frac{11}{31(15457+25000\sqrt{2})}} \left((247 - 345\sqrt{2})x + 98\sqrt{2} + 443 \right)}{\sqrt{2x^2 - x + 3}} \right) \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)), x]

[Out] (13 - 6*x)/(759*(3 - x + 2*x^2)^(3/2)) + (3603 - 658*x)/(128018*Sqrt[3 - x + 2*x^2]) + (Sqrt[(-15457 + 25000*Sqrt[2])/682]*ArcTan[

$(\text{Sqrt}[11/(31*(-15457 + 25000*\text{Sqrt}[2]))])*(443 - 98*\text{Sqrt}[2] + (247 + 345*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]]/484 - (\text{Sqrt}[(15457 + 25000*\text{Sqrt}[2])/682]*\text{ArcTan}[(\text{Sqrt}[11/(31*(15457 + 25000*\text{Sqrt}[2]))])*(443 + 98*\text{Sqrt}[2] + (247 - 345*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/484$

Rubi in Sympy [A] time = 105.101, size = 238, normalized size = 1.2

$$\frac{-119427x + \frac{1307889}{2}}{23235267\sqrt{2x^2 - x + 3}} + \frac{-66x + 143}{8349(2x^2 - x + 3)^{\frac{3}{2}}}$$

$$\frac{\sqrt{682} \left(-57032019\sqrt{2} + \frac{23235267}{2} \right) \left(-\frac{103502553\sqrt{2}}{2} + \frac{935747571}{4} \right) \operatorname{atan} \left(\frac{4\sqrt{341} \left(x \left(\frac{521737359}{4} + \frac{728742465\sqrt{2}}{4} \right) - \frac{103502553\sqrt{2}}{2} + \frac{935747571}{4} \right)}{65481207\sqrt{-15457+25000\sqrt{2}}\sqrt{2x^2-x+3}} \right)}{184098272703399549\sqrt{-15457 + 25000\sqrt{2}}}$$

$$\frac{\sqrt{682} \left(\frac{23235267}{2} + 57032019\sqrt{2} \right) \left(\frac{103502553\sqrt{2}}{2} + \frac{935747571}{4} \right) \operatorname{atanh} \left(\frac{4\sqrt{341} \left(x \left(-\frac{728742465\sqrt{2}}{4} + \frac{521737359}{4} \right) + \frac{103502553\sqrt{2}}{2} + \frac{935747571}{4} \right)}{65481207\sqrt{15457+25000\sqrt{2}}\sqrt{2x^2-x+3}} \right)}{184098272703399549\sqrt{15457 + 25000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)`

[Out] $(-119427*x + 1307889/2)/(23235267*\text{sqrt}(2*x**2 - x + 3)) + (-66*x + 143)/(8349*(2*x**2 - x + 3)**(3/2)) - \text{sqrt}(682)*(-57032019*\text{sqrt}(2) + 23235267/2)*(-103502553*\text{sqrt}(2)/2 + 935747571/4)*\text{atan}(4*\text{sqrt}(341)*x*(521737359/4 + 728742465*\text{sqrt}(2)/4) - 103502553*\text{sqrt}(2)/2 + 935747571/4)/(65481207*\text{sqrt}(-15457 + 25000*\text{sqrt}(2))*\text{sqrt}(2*x**2 - x + 3)))/(184098272703399549*\text{sqrt}(-15457 + 25000*\text{sqrt}(2))) - \text{sqrt}(682)*(23235267/2 + 57032019*\text{sqrt}(2))*(103502553*\text{sqrt}(2)/2 + 935747571/4)*\text{atanh}(4*\text{sqrt}(341)*x*(-728742465*\text{sqrt}(2)/4 + 521737359/4) + 103502553*\text{sqrt}(2)/2 + 935747571/4)/(65481207*\text{sqrt}(15457 + 25000*\text{sqrt}(2))*\text{sqrt}(2*x**2 - x + 3)))/(184098272703399549*\text{sqrt}(15457 + 25000*\text{sqrt}(2)))$

Mathematica [C] time = 6.4295, size = 1176, normalized size = 5.91

$$\begin{aligned}
 & \sqrt{2x^2 - x + 3} \left(\frac{3603 - 658x}{128018(2x^2 - x + 3)} + \frac{13 - 6x}{759(2x^2 - x + 3)^2} \right) \\
 & 5(-69i + 13\sqrt{31}) \tan^{-1} \left(\frac{526291i\sqrt{31}x^4 + 1223508x^4 - 110000i\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 375280i\sqrt{31}x^3 + 187550x^3 + 249000i\sqrt{22(-13+i\sqrt{31})}\sqrt{2x^2-x+3}}{230516\sqrt{31}x^4 + 2998917ix^4 - 221650\sqrt{31}x^3 - 27766} \right) \\
 & + \frac{484\sqrt{682} \left(- \right)}{526291i\sqrt{31}x^4 - 1223508x^4 + 20000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 375280i\sqrt{31}x^3 - 187550x^3 + 7000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}} \\
 & + \frac{484\sqrt{682} \left(13 + \right)}{526291i\sqrt{31}x^4 - 1223508x^4 + 20000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}x^3 + 375280i\sqrt{31}x^3 - 187550x^3 + 7000i\sqrt{682(13+i\sqrt{31})}\sqrt{2x^2-x+3}} \\
 & + \frac{5(69i + 13\sqrt{31}) \log \left((-10ix + \sqrt{31} - 3i)^2 (10ix + \sqrt{31} + 3i)^2 \right)}{968\sqrt{682} (13 + i\sqrt{31})} \\
 & - \frac{5i(-69i + 13\sqrt{31}) \log \left((-10ix + \sqrt{31} - 3i)^2 (10ix + \sqrt{31} + 3i)^2 \right)}{968\sqrt{682} (-13 + i\sqrt{31})} \\
 & + \frac{5i(-69i + 13\sqrt{31}) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682(-13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 469ix + i \right) \right)}{968\sqrt{682} (-13 + i\sqrt{31})} \\
 & - \frac{5(69i + 13\sqrt{31}) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22(13+i\sqrt{31})}\sqrt{2x^2-x+3}x - 22\sqrt{31}x + 1041ix - 63i \right) \right)}{968\sqrt{682} (13 + i\sqrt{31})}
 \end{aligned}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)),x]

[Out] Sqrt[3 - x + 2*x^2]*((13 - 6*x)/(759*(3 - x + 2*x^2)^2) + (3603 - 658*x)/(128018*(3 - x + 2*x^2))) - (5*(-69*I + 13*Sqrt[31])*ArcTan[(-374418 - (31062*I)*Sqrt[31] + 1323762*x - (72154*I)*Sqrt[31]*x + 1185998*x^2 + (657545*I)*Sqrt[31]*x^2 + 187550*x^3 + (375280*I)*Sqrt[31]*x^3 + 1223508*x^4 + (526291*I)*Sqrt[31]*x^4 + (126000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (145000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (249000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - (110000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(4112406*I + 18414*Sqrt[31] + (2234202*I)*x - 165726*Sqrt[31]*x + (6774415*I)*

$$\begin{aligned}
& x^2 + 411246 \sqrt{31} x^2 - (2776640 I) x^3 - 221650 \sqrt{31} x^3 \\
& + (2998917 I) x^4 + 230516 \sqrt{31} x^4) / (484 \sqrt{682} (-13 + \\
& I \sqrt{31})) + (((5 I) / 484) (69 I + 13 \sqrt{31}) \operatorname{ArcTan}[(31 (-36 \\
& 26 I + 594 \sqrt{31} + (24058 I) x - 5346 \sqrt{31} x - (10465 I) x \\
& ^2 + 13266 \sqrt{31} x^2 - (106560 I) x^3 - 7150 \sqrt{31} x^3 - (1 \\
& 7707 I) x^4 + 7436 \sqrt{31} x^4) / (374418 - (31062 I) \sqrt{31} - \\
& 1323762 x - (72154 I) \sqrt{31} x - 1185998 x^2 + (657545 I) \sqrt{31} \\
& x^2 - 187550 x^3 + (375280 I) \sqrt{31} x^3 - 1223508 x^4 + (5 \\
& 26291 I) \sqrt{31} x^4 - (2000 I) \sqrt{682} (13 + I \sqrt{31}) \sqrt{31} \\
& [3 - x + 2 x^2] + (5000 I) \sqrt{682} (13 + I \sqrt{31}) x \sqrt{31} [3 - \\
& x + 2 x^2] + (7000 I) \sqrt{682} (13 + I \sqrt{31}) x^2 \sqrt{31} [3 - x \\
& + 2 x^2] + (20000 I) \sqrt{682} (13 + I \sqrt{31}) x^3 \sqrt{31} [3 - x \\
& + 2 x^2]) / \sqrt{682} (13 + I \sqrt{31}) - (((5 I) / 968) (-69 I + 1 \\
& 3 \sqrt{31}) \operatorname{Log}[(-3 I + \sqrt{31} - (10 I) x)^2 (3 I + \sqrt{31} + \\
& (10 I) x)^2] / \sqrt{682} (-13 + I \sqrt{31}) + (5 (69 I + 13 \sqrt{31} \\
& 1) \operatorname{Log}[(-3 I + \sqrt{31} - (10 I) x)^2 (3 I + \sqrt{31} + (10 I) x \\
&)^2] / (968 \sqrt{682} (13 + I \sqrt{31})) + (((5 I) / 968) (-69 I + 1 \\
& 3 \sqrt{31}) \operatorname{Log}[(2 + 3 x + 5 x^2) (-142 I + 66 \sqrt{31} + (469 I) \\
& x - 22 \sqrt{31} x + (327 I) x^2 + 44 \sqrt{31} x^2 + I \sqrt{682} (- \\
& -13 + I \sqrt{31}) \sqrt{31} [3 - x + 2 x^2] - (4 I) \sqrt{682} (-13 + I \\
& \sqrt{31}) x \sqrt{31} [3 - x + 2 x^2]) / \sqrt{682} (-13 + I \sqrt{31}) \\
& - (5 (69 I + 13 \sqrt{31}) \operatorname{Log}[(2 + 3 x + 5 x^2) (-1858 I + 66 \sqrt{31} \\
& t[31] + (1041 I) x - 22 \sqrt{31} x - (817 I) x^2 + 44 \sqrt{31} x^2 \\
& 2 - (63 I) \sqrt{22} (13 + I \sqrt{31}) \sqrt{31} [3 - x + 2 x^2] + (22 I \\
&) \sqrt{22} (13 + I \sqrt{31}) x \sqrt{31} [3 - x + 2 x^2]) / (968 \sqrt{682} \\
& 82 (13 + I \sqrt{31}))
\end{aligned}$$

Maple [B] time = 0.04, size = 751, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(2*x^2-x+3)^(5/2)/(5*x^2+3*x+2),x)`

[Out] $1/10232728 * (8 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 3 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 8 - 3 * 2^{(1/2)})^{(1/2)} * 2^{(1/2)} * (10111 * 2^{(1/2)} * \arctan(1/11692487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)})) * (-23 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)} * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} + 13910 * \arctan(1/11692487 * (-775687 + 549362 * 2^{(1/2)})^{(1/2)} * (-23 * (8 + 3 * 2^{(1/2)}) * (-23 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 24 * 2^{(1/2)} - 41))^{(1/2)} * (6485 * 2^{(1/2)} * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 10368 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 22379 * 2^{(1/2)} + 32016) / (23 * (2^{(1/2)} - 1 + x)^4 / (2^{(1/2)} + 1 - x)^4 + 82 * (2^{(1/2)} - 1 + x)^2 / (2^{(1/2)} + 1 - x)^2 + 23) * (8 + 3 * 2^{(1/2)}) * (2^{(1/2)} - 1 + x) / (2^{(1/2)} + 1 - x) * (-8866 + 6820 * 2^{(1/2)})^{(1/2)}$

$$\begin{aligned} & /2))^{(1/2)} * (-775687+549362*2^{(1/2)})^{(1/2)} -993674 * \operatorname{arctanh}(31/2 * (8 * \\ & (2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+3*2^{(1/2)} * (2^{(1/2)}-1+x)^2/(2^{(1/2)} \\ &)+1-x)^2+8-3*2^{(1/2)})^{(1/2)}/(-8866+6820*2^{(1/2)})^{(1/2)} * 2^{(1/2)}-4 \\ & 2685698 * \operatorname{arctanh}(31/2 * (8 * (2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+3*2^{(1/2)} \\ & * (2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+8-3*2^{(1/2)})^{(1/2)}/(-8866+6820*2 \\ & ^{(1/2)})^{(1/2)})) / ((8 * (2^{(1/2)}-1+x)^2/(2^{(1/2)}+1-x)^2+3*2^{(1/2)} * (2^ \\ & (1/2)-1+x)^2/(2^{(1/2)}+1-x)^2+8-3*2^{(1/2)}) / (1+(2^{(1/2)}-1+x)/(2^{(1/ \\ & 2)+1-x)})^2)^{(1/2)} / (1+(2^{(1/2)}-1+x)/(2^{(1/2)}+1-x)) / (8+3*2^{(1/2)}) / (\\ & -8866+6820*2^{(1/2)})^{(1/2)} -1/506 * (4*x-1)/(2*x^2-x+3)^{(3/2)} -329/256 \\ & 036 * (4*x-1)/(2*x^2-x+3)^{(1/2)} +1/66/(2*x^2-x+3)^{(3/2)} +13/484/(2*x^ \\ & 2-x+3)^{(1/2)} \end{aligned}$$

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

$$\int \frac{1}{(5x^2 + 3x + 2)(2x^2 - x + 3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)),x, algorithm="maxima")`

[Out] `integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)), x)`

Fricas [A] time = 0.359485, size = 1601, normalized size = 8.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)),x, algorithm="fricas")`

[Out] `-1/110752294271520*232562^(3/4)*sqrt(31)*sqrt(5)*(8*232562^(1/4)*sqrt(31)*sqrt(5)*(197400000*x^3 - 1179600000*x^2 + 15457*sqrt(2)*(3948*x^3 - 23592*x^2 + 19767*x - 39005) + 988350000*x - 195025000)*sqrt(2*x^2 - x + 3)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 1123856268*sqrt(5)*sqrt(2)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(31*(232562^(1/4)*sqrt(5)*(15457*sqrt(2)*(x - 6) + 50000*x - 300000)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 44*sqrt(5)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(2*232562^(1/4)*sqrt(31)*sqrt(5)*(15457*sqrt(2)*x + 50000*x)*sqrt(sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(37682974625135859*x - 88363116363919925) + 50680141738784066*x - 126046090989055784)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 1730745761360000*x^2 + sqrt(2)*(4818553540150000*x^2 + 61656718648993*sqrt(2)*(49*x^2 - 151*x + 200) -`

```

14849011929850000*x + 19667565470000000) + 5425791241111384*sqrt
(2)*(2*x^2 - x + 3) - 8653728806800000*x + 25961186420400000)/(61
656718648993*sqrt(2)*x^2 + 98337827350000*x^2))*sqrt((15457*sqrt(
2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 232562^(1/4)*sqrt
(31)*sqrt(5)*(15457*sqrt(2)*(19*x - 22) + 950000*x - 1100000)*sq
rt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 136
4*sqrt(31)*sqrt(5)*sqrt(2*x^2 - x + 3)*(54*sqrt(2) + 11))) - 1123
856268*sqrt(5)*sqrt(2)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(
-31*(232562^(1/4)*sqrt(5)*(15457*sqrt(2)*(x - 6) + 50000*x - 3000
00)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)
) - 44*sqrt(5)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(2*232562^
(1/4)*sqrt(31)*sqrt(5)*(15457*sqrt(2)*x + 50000*x)*sqrt(-sqrt(2)*
(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(37682974625135859*x
- 88363116363919925) + 50680141738784066*x - 126046090989055784)
)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) -
17307457613600000*x^2 - sqrt(2)*(4818553540150000*x^2 + 61656718
648993*sqrt(2)*(49*x^2 - 151*x + 200) - 14849011929850000*x + 196
67565470000000) - 5425791241111384*sqrt(2)*(2*x^2 - x + 3) + 8653
728806800000*x - 25961186420400000)/(61656718648993*sqrt(2)*x^2 +
98337827350000*x^2))*sqrt((15457*sqrt(2) + 50000)/(772850000*sq
rt(2) + 1488918849)) + 232562^(1/4)*sqrt(31)*sqrt(5)*(15457*sqrt(2)
)*(19*x - 22) + 950000*x - 1100000)*sqrt((15457*sqrt(2) + 50000)/
(772850000*sqrt(2) + 1488918849)) - 1364*sqrt(31)*sqrt(5)*sqrt(2*
x^2 - x + 3)*(54*sqrt(2) + 11))) - 1587*sqrt(31)*sqrt(5)*(200000*
x^4 - 200000*x^3 + 650000*x^2 + 15457*sqrt(2)*(4*x^4 - 4*x^3 + 13
*x^2 - 6*x + 9) - 300000*x + 450000)*log(39062500*sqrt(2)*(2*2325
62^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(37682974625135859*x - 8836
3116363919925) + 50680141738784066*x - 126046090989055784)*sqrt((
15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 173074
57613600000*x^2 + sqrt(2)*(4818553540150000*x^2 + 61656718648993*
sqrt(2)*(49*x^2 - 151*x + 200) - 14849011929850000*x + 1966756547
0000000) + 5425791241111384*sqrt(2)*(2*x^2 - x + 3) - 86537288068
00000*x + 25961186420400000)/(61656718648993*sqrt(2)*x^2 + 983378
27350000*x^2)) + 1587*sqrt(31)*sqrt(5)*(200000*x^4 - 200000*x^3 +
650000*x^2 + 15457*sqrt(2)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9) -
300000*x + 450000)*log(-39062500*sqrt(2)*(2*232562^(1/4)*sqrt(2*x
^2 - x + 3)*(sqrt(2)*(37682974625135859*x - 88363116363919925) +
50680141738784066*x - 126046090989055784)*sqrt((15457*sqrt(2) + 5
0000)/(772850000*sqrt(2) + 1488918849)) - 17307457613600000*x^2 -
sqrt(2)*(4818553540150000*x^2 + 61656718648993*sqrt(2)*(49*x^2 -
151*x + 200) - 14849011929850000*x + 19667565470000000) - 542579
1241111384*sqrt(2)*(2*x^2 - x + 3) + 8653728806800000*x - 2596118
6420400000)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2)))/((
(200000*x^4 - 200000*x^3 + 650000*x^2 + 15457*sqrt(2)*(4*x^4 - 4*
x^3 + 13*x^2 - 6*x + 9) - 300000*x + 450000)*sqrt((15457*sqrt(2)
+ 50000)/(772850000*sqrt(2) + 1488918849)))

```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)
```

```
[Out] Integral(1/((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.98 \quad \int \frac{1}{(3-x+2x^2)^{5/2}(2+3x+5x^2)^2} dx$$

Optimal. Leaf size=234

$$\begin{aligned} & -\frac{15101 - 8654x}{1035276(2x^2 - x + 3)^{3/2}} - \frac{1352542x + 3133427}{523849656\sqrt{2x^2 - x + 3}} + \frac{65x + 4}{682(2x^2 - x + 3)^{3/2}(5x^2 + 3x + 2)} \\ & + \frac{625\sqrt{\frac{1}{682}(30463 + 23600\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(30463+23600\sqrt{2})}}((687+445\sqrt{2})x+242\sqrt{2}+203)}{\sqrt{2x^2-x+3}}\right)}{660176} \\ & - \frac{625\sqrt{\frac{1}{682}(23600\sqrt{2} - 30463)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(23600\sqrt{2}-30463)}}((687-445\sqrt{2})x-242\sqrt{2}+203)}{\sqrt{2x^2-x+3}}\right)}{660176} \end{aligned}$$

[Out] $-(15101 - 8654*x)/(1035276*(3 - x + 2*x^2)^{(3/2)}) - (3133427 + 1352542*x)/(523849656*\text{Sqrt}[3 - x + 2*x^2]) + (4 + 65*x)/(682*(3 - x + 2*x^2)^{(3/2)}*(2 + 3*x + 5*x^2)) + (625*\text{Sqrt}[(30463 + 23600*\text{Sqrt}[2])/682]*\text{ArcTan}[\text{Sqrt}[11/(31*(30463 + 23600*\text{Sqrt}[2]))]]*(203 + 242*\text{Sqrt}[2] + (687 + 445*\text{Sqrt}[2])*x)/\text{Sqrt}[3 - x + 2*x^2]])/660176 - (625*\text{Sqrt}[(-30463 + 23600*\text{Sqrt}[2])/682]*\text{ArcTanh}[\text{Sqrt}[11/(31*(-30463 + 23600*\text{Sqrt}[2]))]]*(203 - 242*\text{Sqrt}[2] + (687 - 445*\text{Sqrt}[2])*x)/\text{Sqrt}[3 - x + 2*x^2]])/660176$

Rubi [A] time = 1.0974, antiderivative size = 234, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\begin{aligned} & -\frac{15101 - 8654x}{1035276(2x^2 - x + 3)^{3/2}} - \frac{1352542x + 3133427}{523849656\sqrt{2x^2 - x + 3}} + \frac{65x + 4}{682(2x^2 - x + 3)^{3/2}(5x^2 + 3x + 2)} \\ & + \frac{625\sqrt{\frac{1}{682}(30463 + 23600\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(30463+23600\sqrt{2})}}((687+445\sqrt{2})x+242\sqrt{2}+203)}{\sqrt{2x^2-x+3}}\right)}{660176} \\ & - \frac{625\sqrt{\frac{1}{682}(23600\sqrt{2} - 30463)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(23600\sqrt{2}-30463)}}((687-445\sqrt{2})x-242\sqrt{2}+203)}{\sqrt{2x^2-x+3}}\right)}{660176} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[1/((3 - x + 2*x^2)^{(5/2)}*(2 + 3*x + 5*x^2)^2), x]$

[Out] $-(15101 - 8654*x)/(1035276*(3 - x + 2*x^2)^{(3/2)}) - (3133427 + 1352542*x)/(523849656*\text{Sqrt}[3 - x + 2*x^2]) + (4 + 65*x)/(682*(3 - x$

$$\begin{aligned}
& + 2*x^2)^{(3/2)}*(2 + 3*x + 5*x^2)) + (625*\text{Sqrt}[(30463 + 23600*\text{Sqrt}[2])/682]*\text{ArcTan}[\text{Sqrt}[11/(31*(30463 + 23600*\text{Sqrt}[2]))]]*(203 + 242*\text{Sqrt}[2] + (687 + 445*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/660176 \\
& - (625*\text{Sqrt}[(-30463 + 23600*\text{Sqrt}[2])/682]*\text{ArcTanh}[\text{Sqrt}[11/(31*(-30463 + 23600*\text{Sqrt}[2]))]]*(203 - 242*\text{Sqrt}[2] + (687 - 445*\text{Sqrt}[2])*x))/\text{Sqrt}[3 - x + 2*x^2]])/660176
\end{aligned}$$

Rubi in Sympy [A] time = 130.288, size = 274, normalized size = 1.17

$$\begin{aligned}
& -\frac{-523567x + \frac{1827221}{2}}{62634198(2x^2 - x + 3)^{\frac{3}{2}}} + \frac{715x + 44}{7502(2x^2 - x + 3)^{\frac{3}{2}}(5x^2 + 3x + 2)} - \frac{\frac{900116701x}{2} + \frac{4170591337}{4}}{174310973034\sqrt{2x^2 - x + 3}} \\
& + \frac{\sqrt{682}\left(\frac{2947974500625}{8} + \frac{1757167066875\sqrt{2}}{4}\right)\left(\frac{246874711875\sqrt{2}}{2} + \frac{1002020889375}{4}\right)\text{atan}\left(\frac{8\sqrt{341}\left(x\left(\frac{6462308634375\sqrt{2}}{8} + \frac{9976642768125}{8}\right) + \frac{2947974500625}{8} + \frac{1757167066875\sqrt{2}}{4}\right)}{450183298125\sqrt{30463+23600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{4747549268759355494555625\sqrt{30463 + 23600\sqrt{2}}} \\
& + \frac{\sqrt{682}\left(-\frac{1757167066875\sqrt{2}}{4} + \frac{2947974500625}{8}\right)\left(-\frac{246874711875\sqrt{2}}{2} + \frac{1002020889375}{4}\right)\text{atanh}\left(\frac{8\sqrt{341}\left(x\left(-\frac{6462308634375\sqrt{2}}{8} + \frac{9976642768125}{8}\right) - \frac{1757167066875\sqrt{2}}{4}\right)}{450183298125\sqrt{-30463+23600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{4747549268759355494555625\sqrt{-30463 + 23600\sqrt{2}}}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2,x)`

[Out] `-(-523567*x + 1827221/2)/(62634198*(2*x**2 - x + 3)**(3/2)) + (715*x + 44)/(7502*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)) - (900116701*x/2 + 4170591337/4)/(174310973034*sqrt(2*x**2 - x + 3)) + sqrt(682)*(2947974500625/8 + 1757167066875*sqrt(2)/4)*(246874711875*sqrt(2)/2 + 1002020889375/4)*atan(8*sqrt(341)*(x*(6462308634375*sqrt(2)/8 + 9976642768125/8) + 2947974500625/8 + 1757167066875*sqrt(2)/4)/(450183298125*sqrt(30463 + 23600*sqrt(2))*sqrt(2*x**2 - x + 3)))/(4747549268759355494555625*sqrt(30463 + 23600*sqrt(2))) + sqrt(682)*(-1757167066875*sqrt(2)/4 + 2947974500625/8)*(-246874711875*sqrt(2)/2 + 1002020889375/4)*atanh(8*sqrt(341)*(x*(-6462308634375*sqrt(2)/8 + 9976642768125/8) - 1757167066875*sqrt(2)/4 + 2947974500625/8)/(450183298125*sqrt(-30463 + 23600*sqrt(2))*sqrt(2*x**2 - x + 3)))/(4747549268759355494555625*sqrt(-30463 + 23600*sqrt(2)))`

Mathematica [C] time = 6.45436, size = 1191, normalized size = 5.09

$$\sqrt{2x^2 - x + 3} \left(\frac{-17230x - 10769}{4224594(2x^2 - x + 3)} + \frac{1235x - 1474}{330088(5x^2 + 3x + 2)} + \frac{-14x - 31}{16698(2x^2 - x + 3)^2} \right)$$

$$3125i(-89i + 7\sqrt{31}) \tan^{-1} \left(\frac{31(2156\sqrt{31}x^4 - 17827ix^4 + 5698\sqrt{31}x^3 - 660176\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2 - 499069i\sqrt{31}x^4 + 849772x^4 + 18880i\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^3 - 274000i\sqrt{31}x^3 + 958210x^3 + 6608i\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2 - 22(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2 + 274000\sqrt{31}x^3 - 958210ix^3 - 235056\sqrt{22}(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2 - 66836\sqrt{31}x^4 + 2865437ix^4 + 176638\sqrt{31}x^3 - 38502i\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2)}{660176\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2} \right)$$

$$3125i(89i + 7\sqrt{31}) \tanh^{-1} \left(\frac{499069\sqrt{31}x^4 - 849772ix^4 + 103840\sqrt{22}(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2 + 274000\sqrt{31}x^3 - 958210ix^3 - 235056\sqrt{22}(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2 - 66836\sqrt{31}x^4 + 2865437ix^4 + 176638\sqrt{31}x^3 - 38502i\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2}{660176\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x^2} \right)$$

$$+ \frac{3125i(89i + 7\sqrt{31}) \log \left((-10ix + \sqrt{31} - 3i)^2 (10ix + \sqrt{31} + 3i)^2 \right)}{1320352\sqrt{682}(-13 + i\sqrt{31})}$$

$$- \frac{3125(-89i + 7\sqrt{31}) \log \left((-10ix + \sqrt{31} - 3i)^2 (10ix + \sqrt{31} + 3i)^2 \right)}{1320352\sqrt{682}(13 + i\sqrt{31})}$$

$$+ \frac{3125i(89i + 7\sqrt{31}) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 + 327ix^2 - 4i\sqrt{682}(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x - 22\sqrt{31}x + 469ix + 1041ix - 660176\sqrt{682}(-13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x \right) \right)}{1320352\sqrt{682}(-13 + i\sqrt{31})}$$

$$+ \frac{3125(-89i + 7\sqrt{31}) \log \left((5x^2 + 3x + 2) \left(44\sqrt{31}x^2 - 817ix^2 + 22i\sqrt{22}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x - 22\sqrt{31}x + 1041ix - 660176\sqrt{682}(13 + i\sqrt{31})\sqrt{2x^2 - x + 3}x \right) \right)}{1320352\sqrt{682}(13 + i\sqrt{31})}$$

Antiderivative was successfully verified.

[In] Integrate[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^2), x]

[Out] Sqrt[3 - x + 2*x^2]*((-31 - 14*x)/(16698*(3 - x + 2*x^2)^2) + (-10769 - 17230*x)/(4224594*(3 - x + 2*x^2)) + (-1474 + 1235*x)/(330088*(2 + 3*x + 5*x^2))) - (((3125*I)/660176)*(-89*I + 7*Sqrt[31])*ArcTan[(31*(14518*I + 7986*Sqrt[31] - (52806*I)*x + 7502*Sqrt[31]*x + (6503*I)*x^2 + 5170*Sqrt[31]*x^2 - (60944*I)*x^3 + 5698*Sqrt[31]*x^3 - (17827*I)*x^4 + 2156*Sqrt[31]*x^4))/(112530 + (65642*I)*Sqrt[31] + 2037134*x - (84762*I)*Sqrt[31]*x + 658130*x^2 - (587559*I)*Sqrt[31]*x^2 + 958210*x^3 - (274000*I)*Sqrt[31]*x^3 + 849772*x^4 - (499069*I)*Sqrt[31]*x^4 - (1888*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (4720*I)*Sqrt[682*(13 + I*Sqrt[31])])

$$\begin{aligned} &]x\sqrt{3-x+2x^2} + (6608I)\sqrt{682(13+I\sqrt{31})}x^2 \\ &2\sqrt{3-x+2x^2} + (18880I)\sqrt{682(13+I\sqrt{31})}x^3 \\ &*\sqrt{3-x+2x^2})/\sqrt{682(13+I\sqrt{31})} - (((3125I)/ \\ &660176)*(89I+7\sqrt{31})*\text{ArcTanh}((-112530I-65642\sqrt{31}- \\ &(2037134I)x+84762\sqrt{31}x-(658130I)x^2+587559\sqrt{31} \\ &31)x^2-(958210I)x^3+274000\sqrt{31}x^3-(849772I)x^4+ \\ &499069\sqrt{31}x^4-118944\sqrt{22(-13+I\sqrt{31})})\sqrt{3} \\ &-x+2x^2-136880\sqrt{22(-13+I\sqrt{31})}x\sqrt{3-x+ \\ &2x^2}-235056\sqrt{22(-13+I\sqrt{31})}x^2\sqrt{3-x+2x^2} \\ &2)+103840\sqrt{22(-13+I\sqrt{31})}x^3\sqrt{3-x+2x^2})/ \\ &(3325942I+247566\sqrt{31}+(4450106I)x+232562\sqrt{31}x \\ &+(5887207I)x^2+160270\sqrt{31}x^2-(3850256I)x^3+17663 \\ &8\sqrt{31}x^3+(2865437I)x^4+66836\sqrt{31}x^4))/\sqrt{682} \\ &*(-13+I\sqrt{31}) - (3125*(-89I+7\sqrt{31}))*\text{Log}((-3I+\sqrt{31} \\ &- (10I)x)^2*(3I+\sqrt{31}+(10I)x)^2)/(1320352\sqrt{682} \\ &*(13+I\sqrt{31})) + (((3125I)/1320352)*(89I+7\sqrt{31}) \\ &)*\text{Log}((-3I+\sqrt{31}-(10I)x)^2*(3I+\sqrt{31}+(10I)x)^2) \\ &)/\sqrt{682*(-13+I\sqrt{31})} - (((3125I)/1320352)*(89I+7\sqrt{31} \\ &)*\text{Log}((2+3x+5x^2)*(-142I+66\sqrt{31}+(469I)x \\ &-22\sqrt{31}x+(327I)x^2+44\sqrt{31}x^2+I\sqrt{682*(-13 \\ &+I\sqrt{31})})\sqrt{3-x+2x^2}-(4I)\sqrt{682*(-13+I\sqrt{31} \\ &31)})x\sqrt{3-x+2x^2}))/\sqrt{682*(-13+I\sqrt{31})} + \\ &(3125*(-89I+7\sqrt{31}))*\text{Log}((2+3x+5x^2)*(-1858I+66\sqrt{31} \\ &+ (1041I)x-22\sqrt{31}x-(817I)x^2+44\sqrt{31}x^2 \\ &- (63I)\sqrt{22(13+I\sqrt{31})})\sqrt{3-x+2x^2}+(22I) \\ &*\sqrt{22(13+I\sqrt{31})}x\sqrt{3-x+2x^2}))/((1320352\sqrt{682} \\ &*(13+I\sqrt{31})) \end{aligned}$$

Maple [B] time = 0.097, size = 5975, normalized size = 25.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{int}(1/(2x^2-x+3)^{(5/2)}/(5x^2+3x+2)^2, x)$

[Out] result too large to display

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

$$\int \frac{1}{(5x^2+3x+2)^2(2x^2-x+3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)), x)
```

Fricas [A] time = 0.365488, size = 1763, normalized size = 7.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)),x, algorithm="fricas")
```

```
[Out] -1/7130321307035874816*930248^(3/4)*sqrt(118)*sqrt(31)*(4*930248^(1/4)*sqrt(118)*sqrt(31)*(638399824000*x^5 + 1542817526400*x^4 + 135911408800*x^3 + 3996489324800*x^2 - 30463*sqrt(2)*(13525420*x^5 + 32686812*x^4 + 2879479*x^3 + 84671384*x^2 - 5712309*x + 31010342) - 269620984800*x + 1463688142400)*sqrt(2*x^2 - x + 3)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 301208632500*sqrt(59)*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*arctan(1829*(930248^(1/4)*sqrt(118)*(30463*sqrt(2)*(x - 6) - 47200*x + 283200)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 88*sqrt(59)*sqrt(2*x^2 - x + 3)*(242*sqrt(2) - 203))/(2*930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(31)*(30463*sqrt(2)*x - 47200*x)*sqrt(-sqrt(2)*(930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x + 22625446139756875) - 77236788905415894*x - 31985896625902144)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 1910458980737753600*x^2 + 59*sqrt(2)*(9015070305869600*x^2 - 130069527342847*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x + 36796205330080000) - 675320985964061624*sqrt(2)*(2*x^2 - x + 3) - 955229490368876800*x + 2865688471106630400)/(130069527342847*sqrt(2)*x^2 - 183981026650400*x^2))*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 59*930248^(1/4)*sqrt(118)*sqrt(31)*(30463*sqrt(2)*(19*x - 22) - 896800*x + 1038400)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) - 160952*sqrt(59)*sqrt(31)*sqrt(2*x^2 - x + 3)*(34*sqrt(2) - 69))) + 301208632500*sqrt(59)*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*arctan(-1829*(930248^(1/4)*sqrt(118)*(30463*sqrt(2)*(x - 6) - 47200*x + 283200)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) - 88*sqrt(59)*sqrt(2*x^2 - x + 3)*(242*sqrt(2) - 203))/(2*930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(31)*(30463*sqrt(2)*x - 47200*x)*sqrt(sqrt(2)*(930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x + 22625446139756875) - 77236788905415894*x - 31985896625902144)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) - 1910458980737753600*x^2 - 59*sqrt(2)*(9015070305869600*x^2 - 130069527342847*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x + 36796205330080000) + 675320985964061624*sqrt(2)*(2*x^2 - x + 3) + 955229490368876800*x - 2865688471106630400)/(130069527342847*sqrt(2)*x^2 - 183981026
```

```

650400*x^2))*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2
041914369)) + 59*930248^(1/4)*sqrt(118)*sqrt(31)*(30463*sqrt(2)*(
19*x - 22) - 896800*x + 1038400)*sqrt((30463*sqrt(2) - 47200)/(14
37853600*sqrt(2) - 2041914369)) + 160952*sqrt(59)*sqrt(31)*sqrt(2
*x^2 - x + 3)*(34*sqrt(2) - 69))) - 991875*sqrt(59)*sqrt(31)*(944
000*x^6 - 377600*x^5 + 2879200*x^4 + 47200*x^3 + 2501600*x^2 - 30
463*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)
+ 708000*x + 849600)*log(-57617187500*sqrt(2)*(930248^(1/4)*sqrt(
118)*sqrt(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x +
22625446139756875) - 77236788905415894*x - 31985896625902144)*sq
rt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 1
910458980737753600*x^2 + 59*sqrt(2)*(9015070305869600*x^2 - 13006
9527342847*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x +
36796205330080000) - 675320985964061624*sqrt(2)*(2*x^2 - x + 3)
- 955229490368876800*x + 2865688471106630400)/(130069527342847*sq
rt(2)*x^2 - 183981026650400*x^2)) + 991875*sqrt(59)*sqrt(31)*(944
000*x^6 - 377600*x^5 + 2879200*x^4 + 47200*x^3 + 2501600*x^2 - 30
463*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)
+ 708000*x + 849600)*log(57617187500*sqrt(2)*(930248^(1/4)*sqrt(1
18)*sqrt(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x +
22625446139756875) - 77236788905415894*x - 31985896625902144)*sq
rt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) - 19
10458980737753600*x^2 - 59*sqrt(2)*(9015070305869600*x^2 - 130069
527342847*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x +
36796205330080000) + 675320985964061624*sqrt(2)*(2*x^2 - x + 3) +
955229490368876800*x - 2865688471106630400)/(130069527342847*sq
rt(2)*x^2 - 183981026650400*x^2)))/((944000*x^6 - 377600*x^5 + 287
9200*x^4 + 47200*x^3 + 2501600*x^2 - 30463*sqrt(2)*(20*x^6 - 8*x^
5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18) + 708000*x + 849600)*sqrt(
(30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)))

```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{5}{2}}(5x^2 + 3x + 2)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2), x)

[Out] Integral(1/((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.99 \quad \int \frac{1}{(3-x+2x^2)^{5/2}(2+3x+5x^2)^3} dx$$

Optimal. Leaf size=269

$$\frac{\frac{1134826571 - 1504660754x}{476353953856\sqrt{2x^2 - x + 3}} + \frac{86885x + 46386}{1860496(2x^2 - x + 3)^{3/2}(5x^2 + 3x + 2)}}{\frac{12280939 - 19536786x}{2824232928(2x^2 - x + 3)^{3/2}} + \frac{65x + 4}{1364(2x^2 - x + 3)^{3/2}(5x^2 + 3x + 2)^2}} + \frac{35\sqrt{\frac{1}{682}(2243059557247 + 2011748500000\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(2243059557247 + 2011748500000\sqrt{2})}}((6290431 + 3861685\sqrt{2})x + 2428746\sqrt{2} + 1432939)}}{\sqrt{2x^2 - x + 3}}\right)}{1800960128} + \frac{35\sqrt{\frac{1}{682}(2011748500000\sqrt{2} - 2243059557247)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(2011748500000\sqrt{2} - 2243059557247)}}((6290431 - 3861685\sqrt{2})x - 2428746\sqrt{2} + 1432939)}}{\sqrt{2x^2 - x + 3}}\right)}{1800960128}$$

[Out] $-(12280939 - 19536786*x)/(2824232928*(3 - x + 2*x^2)^(3/2)) - (1134826571 - 1504660754*x)/(476353953856*sqrt[3 - x + 2*x^2]) + (4 + 65*x)/(1364*(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2) + (46386 + 86885*x)/(1860496*(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)) + (35*sqrt[(2243059557247 + 2011748500000*sqrt[2])/682]*ArcTan[(sqrt[11/(31*(2243059557247 + 2011748500000*sqrt[2])])]*(1432939 + 2428746*sqrt[2] + (6290431 + 3861685*sqrt[2])*x))/sqrt[3 - x + 2*x^2]])/1800960128 - (35*sqrt[(-2243059557247 + 2011748500000*sqrt[2])/682]*ArcTanh[(sqrt[11/(31*(-2243059557247 + 2011748500000*sqrt[2])])]*(1432939 - 2428746*sqrt[2] + (6290431 - 3861685*sqrt[2])*x))/sqrt[3 - x + 2*x^2]])/1800960128$

Rubi [A] time = 1.23242, antiderivative size = 269, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{\frac{1134826571 - 1504660754x}{476353953856\sqrt{2x^2 - x + 3}} + \frac{86885x + 46386}{1860496(2x^2 - x + 3)^{3/2}(5x^2 + 3x + 2)}}{\frac{12280939 - 19536786x}{2824232928(2x^2 - x + 3)^{3/2}} + \frac{65x + 4}{1364(2x^2 - x + 3)^{3/2}(5x^2 + 3x + 2)^2}} + \frac{35\sqrt{\frac{1}{682}(2243059557247 + 2011748500000\sqrt{2})} \tan^{-1}\left(\frac{\sqrt{\frac{11}{31(2243059557247 + 2011748500000\sqrt{2})}}((6290431 + 3861685\sqrt{2})x + 2428746\sqrt{2} + 1432939)}}{\sqrt{2x^2 - x + 3}}\right)}{1800960128} + \frac{35\sqrt{\frac{1}{682}(2011748500000\sqrt{2} - 2243059557247)} \tanh^{-1}\left(\frac{\sqrt{\frac{11}{31(2011748500000\sqrt{2} - 2243059557247)}}((6290431 - 3861685\sqrt{2})x - 2428746\sqrt{2} + 1432939)}}{\sqrt{2x^2 - x + 3}}\right)}{1800960128}$$

Antiderivative was successfully verified.

[In] Int[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3), x]

[Out] $-(12280939 - 19536786*x)/(2824232928*(3 - x + 2*x^2)^{(3/2)}) - (1134826571 - 1504660754*x)/(476353953856*\text{Sqrt}[3 - x + 2*x^2]) + (4 + 65*x)/(1364*(3 - x + 2*x^2)^{(3/2)}*(2 + 3*x + 5*x^2)^2) + (46386 + 86885*x)/(1860496*(3 - x + 2*x^2)^{(3/2)}*(2 + 3*x + 5*x^2)) + (35*\text{Sqrt}[(2243059557247 + 2011748500000*\text{Sqrt}[2])/682]*\text{ArcTan}[(\text{Sqrt}[11/(31*(2243059557247 + 2011748500000*\text{Sqrt}[2]))])*(1432939 + 2428746*\text{Sqrt}[2] + (6290431 + 3861685*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2])/1800960128 - (35*\text{Sqrt}[-2243059557247 + 2011748500000*\text{Sqrt}[2])/682]*\text{ArcTanh}[(\text{Sqrt}[11/(31*(-2243059557247 + 2011748500000*\text{Sqrt}[2]))])*(1432939 - 2428746*\text{Sqrt}[2] + (6290431 - 3861685*\text{Sqrt}[2])*x)]/\text{Sqrt}[3 - x + 2*x^2])/1800960128$

Rubi in Sympy [A] time = 152.126, size = 308, normalized size = 1.14

$$\begin{aligned} & -\frac{-\frac{33044607148971x}{4} + \frac{49844987478033}{8}}{2615361839402136\sqrt{2x^2 - x + 3}} - \frac{-\frac{13001731083x}{2} + \frac{16345929809}{4}}{939763506792(2x^2 - x + 3)^{\frac{3}{2}}} \\ & + \frac{715x + 44}{15004(2x^2 - x + 3)^{\frac{3}{2}}(5x^2 + 3x + 2)^2} + \frac{\frac{10513085x}{2} + 2806353}{112560008(2x^2 - x + 3)^{\frac{3}{2}}(5x^2 + 3x + 2)} \\ & + \frac{\sqrt{682}\left(\frac{12818467299989505}{16} + \frac{10863268143647535\sqrt{2}}{8}\right)\left(\frac{1177425894955695\sqrt{2}}{4} + \frac{6020347019301615}{8}\right)\text{atan}\left(\frac{16\sqrt{341}\left(x\left(\frac{34545003587284575\sqrt{2}}{16} + \frac{56271539874579645}{16}\right) + 277312911645\sqrt{2243059557247 + 2011748500000\sqrt{2}}\right)}{277312911645\sqrt{2243059557247 + 2011748500000\sqrt{2}}}\right)}{21939526602367333910816280030\sqrt{2243059557247 + 2011748500000\sqrt{2}}} \\ & + \frac{\sqrt{682}\left(-\frac{10863268143647535\sqrt{2}}{8} + \frac{12818467299989505}{16}\right)\left(-\frac{1177425894955695\sqrt{2}}{4} + \frac{6020347019301615}{8}\right)\text{atanh}\left(\frac{16\sqrt{341}\left(x\left(-\frac{34545003587284575\sqrt{2}}{16} + \frac{56271539874579645}{16}\right) + 277312911645\sqrt{-2243059557247 + 2011748500000\sqrt{2}}\right)}{277312911645\sqrt{-2243059557247 + 2011748500000\sqrt{2}}}\right)}{21939526602367333910816280030\sqrt{-2243059557247 + 2011748500000\sqrt{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3, x)

[Out] $-(-33044607148971*x/4 + 49844987478033/8)/(2615361839402136*\text{sqrt}(2*x**2 - x + 3)) - (-13001731083*x/2 + 16345929809/4)/(939763506792*(2*x**2 - x + 3)**(3/2)) + (715*x + 44)/(15004*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2) + (10513085*x/2 + 2806353)/(112560008*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)) + \text{sqrt}(682)*(12818467299989505/16 + 10863268143647535*\text{sqrt}(2)/8)*(1177425894955695*\text{sqrt}(2)/4 + 6020347019301615/8)*\text{atan}(16*\text{sqrt}(341)*(x*(34545003587284575*\text{sqrt}(2)/16 + 56271539874579645/16) + 277312911645*\text{sqrt}(2243059557247 + 2011748500000*\text{sqrt}(2)))*\text{sqrt}(2*x**2 - x + 3)))/(21939526602367333910816280030*\text{sqrt}(2243059557247 + 2011748500000*\text{sqrt}(2))) + \text{sqrt}(682)*(-10863268143647535*\text{sqrt}(2)/8 + 12818467299989505/16)*(1177425894955695*\text{sqrt}(2)/4 + 6020347019301615/8)*\text{atanh}(16*\text{sqrt}(341)*(x*(-34545003587284575*\text{sqrt}(2)/16 + 56271539874579645/16) + 277312911645*\text{sqrt}(-2243059557247 + 2011748500000*\text{sqrt}(2)))*\text{sqrt}(2*x**2 - x + 3)))/(21939526602367333910816280030*\text{sqrt}(-2243059557247 + 2011748500000*\text{sqrt}(2)))$


```
t(682)*(-10863268143647535*sqrt(2)/8 + 12818467299989505/16)*(-11
77425894955695*sqrt(2)/4 + 6020347019301615/8)*atanh(16*sqrt(341)
*(x*(-34545003587284575*sqrt(2)/16 + 56271539874579645/16) - 1086
3268143647535*sqrt(2)/8 + 12818467299989505/16)/(277312911645*sq
rt(-2243059557247 + 2011748500000*sqrt(2))*sqrt(2*x**2 - x + 3))/
(21939526602367333910816280030*sqrt(-2243059557247 + 201174850000
0*sqrt(2)))
```

Mathematica [C] time = 6.48412, size = 1218, normalized size = 4.53

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((-11 + 90*x)/(367356*(3 - x + 2*x^2)^2) + (-
39095 + 53754*x)/(61960712*(3 - x + 2*x^2)) + (-1474 + 1235*x)/(6
60176*(2 + 3*x + 5*x^2)^2) + (157362 + 468895*x)/(81861824*(2 + 3
*x + 5*x^2))) + (175*(772337*I + 81951*sqrt[31])*ArcTan[(46553644
48878 + (4766043812202*I)*sqrt[31] - 158699364373902*x - (2787485
821466*I)*sqrt[31]*x - 74012991583058*x^2 - (54042219198695*I)*sq
rt[31]*x^2 - 61598686386050*x^3 - (27260449836880*I)*sqrt[31]*x^3
- 86332728860268*x^4 - (44936737584061*I)*sqrt[31]*x^4 + (101392
12440000*I)*sqrt[22*(-13 + I*sqrt[31])]*sqrt[3 - x + 2*x^2] + (11
668141300000*I)*sqrt[22*(-13 + I*sqrt[31])]*x*sqrt[3 - x + 2*x^2]
+ (20037015060000*I)*sqrt[22*(-13 + I*sqrt[31])]*x^2*sqrt[3 - x
+ 2*x^2] - (8851693400000*I)*sqrt[22*(-13 + I*sqrt[31])]*x^3*sqrt
[3 - x + 2*x^2])/(276508696366774*I + 21211104525006*sqrt[31] + (
386113686180858*I)*x + 27073970836946*sqrt[31]*x + (5722577808965
35*I)*x^2 + 16500157269134*sqrt[31]*x^2 - (293982300056560*I)*x^3
+ 18182603589150*sqrt[31]*x^3 + (303413457358093*I)*x^4 + 916057
8170964*sqrt[31]*x^4)]/(1800960128*sqrt[682*(-13 + I*sqrt[31])])
- (((175*I)/1800960128)*(-772337*I + 81951*sqrt[31])*ArcTan[(31*
(1463582697846*I + 684229178226*sqrt[31] - (4719782741318*I)*x +
873353897966*sqrt[31]*x - (1716989286985*I)*x^2 + 532263137714*sq
rt[31]*x^2 - (6299191456240*I)*x^3 + 586535599650*sqrt[31]*x^3 -
(3427809818003*I)*x^4 + 295502521644*sqrt[31]*x^4))/(-46553644488
78 + (4766043812202*I)*sqrt[31] + 158699364373902*x - (2787485821
466*I)*sqrt[31]*x + 74012991583058*x^2 - (54042219198695*I)*sqrt[
31]*x^2 + 61598686386050*x^3 - (27260449836880*I)*sqrt[31]*x^3 +
86332728860268*x^4 - (44936737584061*I)*sqrt[31]*x^4 - (160939880
000*I)*sqrt[682*(13 + I*sqrt[31])]*sqrt[3 - x + 2*x^2] + (4023497
00000*I)*sqrt[682*(13 + I*sqrt[31])]*x*sqrt[3 - x + 2*x^2] + (563
289580000*I)*sqrt[682*(13 + I*sqrt[31])]*x^2*sqrt[3 - x + 2*x^2]
+ (1609398800000*I)*sqrt[682*(13 + I*sqrt[31])]*x^3*sqrt[3 - x +
2*x^2])]/sqrt[682*(13 + I*sqrt[31])] - (175*(-772337*I + 81951*sq
rt[31])*Log[(-3*I + sqrt[31] - (10*I)*x)^2*(3*I + sqrt[31] + (10
*I)*x)^2]/(3601920256*sqrt[682*(13 + I*sqrt[31])]) + (((175*I)/3
601920256)*(772337*I + 81951*sqrt[31])*Log[(-3*I + sqrt[31] - (10
```

```

*I*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2))/Sqrt[682*(-13 + I*Sqrt[31])] - (((175*I)/3601920256)*(772337*I + 81951*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31]))]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31]))]*x*Sqrt[3 - x + 2*x^2]])/Sqrt[682*(-13 + I*Sqrt[31])] + (175*(-772337*I + 81951*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31]))]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31]))]*x*Sqrt[3 - x + 2*x^2]])/(3601920256*Sqrt[682*(13 + I*Sqrt[31])])

```

Maple [B] time = 0.203, size = 18877, normalized size = 70.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^3,x)
```

[Out] result too large to display

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

$$\int \frac{1}{(5x^2 + 3x + 2)^3(2x^2 - x + 3)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)), x)
```

Fricas [A] time = 0.39633, size = 1871, normalized size = 6.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)),x, algorithm="fricas")
```

```
[Out] 1/331623382992276885903799296*sqrt(4023497)*232562^(3/4)*sqrt(31)
*(8*sqrt(4023497)*232562^(1/4)*sqrt(31)*(908099704460510700000000
*x^7 - 49225902468460560000000*x^6 + 2385626832512200707000000*x^
5 + 701060615070738617000000*x^4 + 2089093042994306145000000*x^3
+ 718801605996755227000000*x^2 - 2243059557247*sqrt(2)*(225699113
100*x^7 - 12234606480*x^6 + 592923725931*x^5 + 174241614961*x^4 +
519223213785*x^3 + 178650961091*x^2 + 218659985088*x + 973933553
2) + 879777794021612736000000*x + 39186187294995404000000)*sqrt(2
*x^2 - x + 3)*sqrt((2243059557247*sqrt(2) - 4023497000000)/(90249
43399404632759000000*sqrt(2) - 13125580231861607670219009)) - 216
4988593398757980*sqrt(4023497)*sqrt(2)*(100*x^8 + 20*x^7 + 321*x^
6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36)*arctan(31*
(sqrt(4023497)*232562^(1/4)*(2243059557247*sqrt(2)*(x - 6) - 4023
497000000*x + 24140982000000)*sqrt((2243059557247*sqrt(2) - 40234
97000000)/(9024943399404632759000000*sqrt(2) - 131255802318616076
70219009)) + 44*sqrt(4023497)*sqrt(2*x^2 - x + 3)*(2428746*sqrt(2
) - 1432939))/(2*sqrt(4023497)*232562^(1/4)*sqrt(31)*(22430595572
47*sqrt(2)*x - 4023497000000*x)*sqrt(-sqrt(2)*(2*232562^(1/4)*sqr
t(2*x^2 - x + 3)*(sqrt(2)*(24665107784508685314382461770132037300
1093723*x + 102761290593568843281903286139043195976787275) - 3494
12368438655696425727903840363568977880998*x - 1438897872515180098
61921331562277177024306448)*sqrt((2243059557247*sqrt(2) - 4023497
000000)/(9024943399404632759000000*sqrt(2) - 13125580231861607670
219009)) + 16420395864831211291440074844761744000000*x^2 + sqrt(2
)* (4571587485095053143639566292007531000000*x^2 - 657532908761638
14995277292515063108223*sqrt(2)*(49*x^2 - 151*x + 200) - 14087953
270394959687542336940676269000000*x + 186595407554900128311819032
32683800000000) - 5786289597102415719584401741325553523624*sqrt(2
)*(2*x^2 - x + 3) - 8210197932415605645720037422380872000000*x +
24630593797246816937160112267142616000000)/(657532908761638149952
77292515063108223*sqrt(2)*x^2 - 932977037774500641559095161634190
00000*x^2))*sqrt((2243059557247*sqrt(2) - 4023497000000)/(9024943
399404632759000000*sqrt(2) - 13125580231861607670219009)) + sqrt(
4023497)*232562^(1/4)*sqrt(31)*(2243059557247*sqrt(2)*(19*x - 22)
- 76446443000000*x + 88516934000000)*sqrt((2243059557247*sqrt(2)
- 4023497000000)/(9024943399404632759000000*sqrt(2) - 1312558023
1861607670219009)) - 1364*sqrt(4023497)*sqrt(31)*sqrt(2*x^2 - x +
3)*(263242*sqrt(2) - 672997))) - 2164988593398757980*sqrt(402349
7)*sqrt(2)*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*
x^3 + 241*x^2 + 84*x + 36)*arctan(-31*(sqrt(4023497)*232562^(1/4)
*(2243059557247*sqrt(2)*(x - 6) - 4023497000000*x + 2414098200000
0)*sqrt((2243059557247*sqrt(2) - 4023497000000)/(9024943399404632
759000000*sqrt(2) - 13125580231861607670219009)) - 44*sqrt(402349
7)*sqrt(2*x^2 - x + 3)*(2428746*sqrt(2) - 1432939))/(2*sqrt(40234
97)*232562^(1/4)*sqrt(31)*(2243059557247*sqrt(2)*x - 402349700000
0*x)*sqrt(sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(2
46651077845086853143824617701320373001093723*x + 1027612905935688
43281903286139043195976787275) - 34941236843865569642572790384036
3568977880998*x - 143889787251518009861921331562277177024306448)*
sqrt((2243059557247*sqrt(2) - 4023497000000)/(9024943399404632759
000000*sqrt(2) - 13125580231861607670219009)) - 16420395864831211
291440074844761744000000*x^2 - sqrt(2)*(4571587485095053143639566
292007531000000*x^2 - 65753290876163814995277292515063108223*sqrt
(2)*(49*x^2 - 151*x + 200) - 140879532703949596875423369406762690
```

$$\begin{aligned}
& 00000*x + 18659540755490012831181903232683800000000) + 5786289597 \\
& 102415719584401741325553523624*\sqrt{2}*(2*x^2 - x + 3) + 82101979 \\
& 32415605645720037422380872000000*x - 2463059379724681693716011226 \\
& 7142616000000)/(65753290876163814995277292515063108223*\sqrt{2}*x^2 \\
& - 93297703777450064155909516163419000000*x^2))*\sqrt{((2243059557 \\
& 247*\sqrt{2} - 4023497000000)/(9024943399404632759000000*\sqrt{2} - \\
& 13125580231861607670219009)) + \sqrt{4023497}*232562^{(1/4)}*\sqrt{3} \\
& 1)*(2243059557247*\sqrt{2}*(19*x - 22) - 76446443000000*x + 885169 \\
& 34000000)*\sqrt{((2243059557247*\sqrt{2} - 4023497000000)/(902494339 \\
& 9404632759000000*\sqrt{2} - 13125580231861607670219009)) + 1364*\sqrt{ \\
& \sqrt{4023497}*\sqrt{31}*\sqrt{2*x^2 - x + 3}*(263242*\sqrt{2} - 672997 \\
&))} + 55545*\sqrt{4023497}*\sqrt{31}*(402349700000000*x^8 + 8046994 \\
& 0000000*x^7 + 1291542537000000*x^6 + 692041484000000*x^5 + 156916 \\
& 3830000000*x^4 + 949545292000000*x^3 + 969662777000000*x^2 - 2243 \\
& 059557247*\sqrt{2}*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 \\
& + 236*x^3 + 241*x^2 + 84*x + 36) + 337973748000000*x + 144845892 \\
& 000000)*\log(-19366159114781274414062500*\sqrt{2}*(2*232562^{(1/4)}*\sqrt{ \\
& \sqrt{2*x^2 - x + 3}*(\sqrt{2}*(246651077845086853143824617701320373 \\
& 001093723*x + 102761290593568843281903286139043195976787275) - 34 \\
& 9412368438655696425727903840363568977880998*x - 14388978725151800 \\
& 9861921331562277177024306448)*\sqrt{((2243059557247*\sqrt{2} - 40234 \\
& 97000000)/(9024943399404632759000000*\sqrt{2} - 131255802318616076 \\
& 70219009)) + 16420395864831211291440074844761744000000*x^2 + \sqrt{ \\
& (2)*(4571587485095053143639566292007531000000*x^2 - 6575329087616 \\
& 3814995277292515063108223*\sqrt{2}*(49*x^2 - 151*x + 200) - 140879 \\
& 53270394959687542336940676269000000*x + 1865954075549001283118190 \\
& 3232683800000000) - 5786289597102415719584401741325553523624*\sqrt{ \\
& (2)*(2*x^2 - x + 3) - 8210197932415605645720037422380872000000*x \\
& + 24630593797246816937160112267142616000000)/(6575329087616381499 \\
& 5277292515063108223*\sqrt{2}*x^2 - 9329770377745006415590951616341 \\
& 9000000*x^2)) - 55545*\sqrt{4023497}*\sqrt{31}*(402349700000000*x^8 \\
& + 80469940000000*x^7 + 1291542537000000*x^6 + 692041484000000*x^5 \\
& + 1569163830000000*x^4 + 949545292000000*x^3 + 969662777000000* \\
& x^2 - 2243059557247*\sqrt{2}*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 \\
& + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36) + 337973748000000*x + \\
& 144845892000000)*\log(19366159114781274414062500*\sqrt{2}*(2*23256 \\
& 2^{(1/4)}*\sqrt{2*x^2 - x + 3}*(\sqrt{2}*(246651077845086853143824617 \\
& 701320373001093723*x + 102761290593568843281903286139043195976787 \\
& 275) - 349412368438655696425727903840363568977880998*x - 14388978 \\
& 7251518009861921331562277177024306448)*\sqrt{((2243059557247*\sqrt{2} \\
&) - 4023497000000)/(9024943399404632759000000*\sqrt{2} - 131255802 \\
& 31861607670219009)) - 16420395864831211291440074844761744000000*x \\
& ^2 - \sqrt{2}*(4571587485095053143639566292007531000000*x^2 - 6575 \\
& 3290876163814995277292515063108223*\sqrt{2}*(49*x^2 - 151*x + 200) \\
& - 14087953270394959687542336940676269000000*x + 1865954075549001 \\
& 2831181903232683800000000) + 578628959710241571958440174132555352 \\
& 3624*\sqrt{2}*(2*x^2 - x + 3) + 8210197932415605645720037422380872 \\
& 000000*x - 24630593797246816937160112267142616000000)/(6575329087 \\
& 6163814995277292515063108223*\sqrt{2}*x^2 - 9329770377745006415590 \\
& 9516163419000000*x^2)))/((402349700000000*x^8 + 80469940000000*x^7 \\
& + 1291542537000000*x^6 + 692041484000000*x^5 + 1569163830000000 \\
& *x^4 + 949545292000000*x^3 + 969662777000000*x^2 - 2243059557247* \\
& \sqrt{2}*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 \\
& + 241*x^2 + 84*x + 36) + 337973748000000*x + 144845892000000)*\sqrt{ \\
\end{aligned}$$

```
rt((2243059557247*sqrt(2) - 4023497000000)/(902494339940463275900
0000*sqrt(2) - 13125580231861607670219009)))
```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3), x)
```

```
[Out] Integral(1/((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**3), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

$$3.100 \quad \int \sqrt{a + bx + cx^2} (d + ex + fx^2)^2 dx$$

Optimal. Leaf size=436

$$\begin{aligned} & \frac{(b^2 - 4ac) \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (8c^2 (2a^2f^2 + 12abef + 5b^2 (2df + e^2)) - 56b^2cf(af + be) - 32c^3 (a (2df + e^2) + 4bde) + 21b^4f^2)}{1024c^{11/2}} \\ & + \frac{(b + 2cx)\sqrt{a + bx + cx^2} (8c^2 (2a^2f^2 + 12abef + 5b^2 (2df + e^2)) - 56b^2cf(af + be) - 32c^3 (a (2df + e^2) + 4bde) + 21b^4f^2)}{512c^5} \\ & + \frac{(a + bx + cx^2)^{3/2} (-8c^2 (32aef + 25b (2df + e^2)) + 28bcf(7af + 10be) - 105b^3f^2 + 640c^3de)}{960c^4} \\ & + \frac{x (a + bx + cx^2)^{3/2} (-4cf(5af + 14be) + 21b^2f^2 + 40c^2 (2df + e^2))}{160c^3} \\ & + \frac{fx^2 (a + bx + cx^2)^{3/2} (8ce - 3bf)}{20c^2} + \frac{f^2x^3 (a + bx + cx^2)^{3/2}}{6c} \end{aligned}$$

[Out] $((128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b^2*(e^2 + 2*d*f)))* (b + 2*c*x)*\text{Sqrt}[a + b*x + c*x^2])/(512*c^5) + ((640*c^3*d*e - 105*b^3*f^2 + 28*b*c*f*(10*b*e + 7*a*f) - 8*c^2*(32*a*e*f + 25*b*(e^2 + 2*d*f)))* (a + b*x + c*x^2)^{(3/2)})/(960*c^4) + ((21*b^2*f^2 - 4*c*f*(14*b*e + 5*a*f) + 40*c^2*(e^2 + 2*d*f))*x*(a + b*x + c*x^2)^{(3/2)})/(160*c^3) + (f*(8*c*e - 3*b*f)*x^2*(a + b*x + c*x^2)^{(3/2)})/(20*c^2) + (f^2*x^3*(a + b*x + c*x^2)^{(3/2)})/(6*c) - ((b^2 - 4*a*c)*(128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b^2*(e^2 + 2*d*f)))*\text{ArcTanh}[(b + 2*c*x)/(2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2])])/(1024*c^{(11/2)})$

Rubi [A] time = 1.497, antiderivative size = 436, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned} & \frac{(b^2 - 4ac) \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (8c^2 (2a^2f^2 + 12abef + 5b^2 (2df + e^2)) - 56b^2cf(af + be) - 32c^3 (a (2df + e^2) + 4bde) + 21b^4f^2)}{1024c^{11/2}} \\ & + \frac{(b + 2cx)\sqrt{a + bx + cx^2} (8c^2 (2a^2f^2 + 12abef + 5b^2 (2df + e^2)) - 56b^2cf(af + be) - 32c^3 (a (2df + e^2) + 4bde) + 21b^4f^2)}{512c^5} \\ & + \frac{(a + bx + cx^2)^{3/2} (-8c^2 (32aef + 25b (2df + e^2)) + 28bcf(7af + 10be) - 105b^3f^2 + 640c^3de)}{960c^4} \\ & + \frac{x (a + bx + cx^2)^{3/2} (-4cf(5af + 14be) + 21b^2f^2 + 40c^2 (2df + e^2))}{160c^3} \\ & + \frac{fx^2 (a + bx + cx^2)^{3/2} (8ce - 3bf)}{20c^2} + \frac{f^2x^3 (a + bx + cx^2)^{3/2}}{6c} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)^2,x]

[Out]
$$\begin{aligned} & ((128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*(4*b \\ & *d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b^2*(\\ & e^2 + 2*d*f))) * (b + 2*c*x) * \text{Sqrt}[a + b*x + c*x^2]) / (512*c^5) + ((6 \\ & 40*c^3*d*e - 105*b^3*f^2 + 28*b*c*f*(10*b*e + 7*a*f) - 8*c^2*(32* \\ & a*e*f + 25*b*(e^2 + 2*d*f))) * (a + b*x + c*x^2)^{(3/2)}) / (960*c^4) + \\ & ((21*b^2*f^2 - 4*c*f*(14*b*e + 5*a*f) + 40*c^2*(e^2 + 2*d*f)) * x * \\ & (a + b*x + c*x^2)^{(3/2)}) / (160*c^3) + (f*(8*c^2*e - 3*b*f) * x^2 * (a + \\ & b*x + c*x^2)^{(3/2)}) / (20*c^2) + (f^2*x^3 * (a + b*x + c*x^2)^{(3/2)}) / \\ & (6*c) - ((b^2 - 4*a*c) * (128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b* \\ & e + a*f) - 32*c^3*(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f \\ & + 2*a^2*f^2 + 5*b^2*(e^2 + 2*d*f))) * \text{ArcTanh}[(b + 2*c*x) / (2*\text{Sqrt}[\\ & c] * \text{Sqrt}[a + b*x + c*x^2])]) / (1024*c^{(11/2)}) \end{aligned}$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d)**2,x)

[Out] Timed out

Mathematica [A] time = 1.19413, size = 456, normalized size = 1.05

$$2\sqrt{c}\sqrt{a+x(b+cx)}(16bc^2(113a^2f^2-2ac(f(130d+17fx^2)+65e^2+58efx)+4c^2(30d^2+10dx(2e+fx)+x^2(5e^2+6efx)))$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)^2,x]

[Out]
$$\begin{aligned} & (2*\text{Sqrt}[c] * \text{Sqrt}[a + x*(b + c*x)] * (315*b^5*f^2 - 210*b^4*c*f*(4*e \\ & + f*x) - 16*b^2*c^2*(-2*a*f*(115*e + 28*f*x) + c*(120*d*e + 25*e^2 \\ & 2*x + 50*d*f*x + 28*e*f*x^2 + 9*f^2*x^3)) + 8*b^3*c*(-210*a*f^2 + \\ & c*(75*e^2 + 70*e*f*x + 3*f*(50*d + 7*f*x^2))) + 16*b*c^2*(113*a^2 \\ & 2*f^2 - 2*a*c*(65*e^2 + 58*e*f*x + f*(130*d + 17*f*x^2)) + 4*c^2* \\ & (30*d^2 + 10*d*x*(2*e + f*x) + x^2*(5*e^2 + 6*e*f*x + 2*f^2*x^2)) \\ &) - 32*c^3*(a^2*f*(64*e + 15*f*x) - 2*a*c*(80*d*e + 15*e^2*x + 30 \\ & *d*f*x + 16*e*f*x^2 + 5*f^2*x^3) - 4*c^2*x*(30*d^2 + 10*d*x*(4*e \\ & + 3*f*x) + x^2*(15*e^2 + 24*e*f*x + 10*f^2*x^2))) - 15*(b^2 - 4* \end{aligned}$$

$$a^*c)^*(128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b^2*(e^2 + 2*d*f)))*\text{Log}[b + 2*c*x + 2*\text{Sqrt}[c]*\text{Sqrt}[a + x*(b + c*x)]]/(15360*c^(11/2))$$

Maple [B] time = 0.027, size = 1429, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]
$$\begin{aligned} &7/24*e*f*b^2/c^3*(c*x^2+b*x+a)^{(3/2)}+2/5*e*f*x^2*(c*x^2+b*x+a)^{(3/2)}/c+3/8*e*f*b/c^2*a*(c*x^2+b*x+a)^{(1/2)}*x+1/6*f^2*x^3*(c*x^2+b*x+a)^{(3/2)}/c+1/4*d^2/c*(c*x^2+b*x+a)^{(1/2)}*b+1/2*d^2/c^{(1/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*a-1/8*d^2/c^{(3/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*b^2+2/3*d*e*(c*x^2+b*x+a)^{(3/2)}/c+1/4*x*(c*x^2+b*x+a)^{(3/2)}/c*e^2-5/24*b/c^2*(c*x^2+b*x+a)^{(3/2)}*e^2+5/64*b^3/c^3*(c*x^2+b*x+a)^{(1/2)}*e^2-5/128*b^4/c^{(7/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*e^2-1/8/c^{(3/2)}*a^2*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*e^2-7/64*f^2*b^3/c^4*(c*x^2+b*x+a)^{(3/2)}+21/512*f^2*b^5/c^5*(c*x^2+b*x+a)^{(1/2)}-21/1024*f^2*b^6/c^{(11/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})+1/16*f^2/c^{(5/2)}*a^3*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})-5/16*e*f*b^3/c^{(7/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*a+3/16*e*f*b^2/c^3*a*(c*x^2+b*x+a)^{(1/2)}+3/8*e*f*b/c^{(5/2)}*a^2*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})-1/8/c^2*a*(c*x^2+b*x+a)^{(1/2)}*b*d*f-1/2*d*e*b/c*(c*x^2+b*x+a)^{(1/2)}*x-1/2*d*e*b/c^{(3/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*a-7/20*e*f*b/c^2*x*(c*x^2+b*x+a)^{(3/2)}-7/32*e*f*b^3/c^3*(c*x^2+b*x+a)^{(1/2)}*x-7/32*f^2*b^2/c^3*a*(c*x^2+b*x+a)^{(1/2)}*x+5/16*b^2/c^2*(c*x^2+b*x+a)^{(1/2)}*x*d*f+3/8*b^2/c^{(5/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*a*d*f-1/4/c*a*(c*x^2+b*x+a)^{(1/2)}*x*d*f-7/64*e*f*b^4/c^4*(c*x^2+b*x+a)^{(1/2)}+7/128*e*f*b^5/c^{(9/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})-4/15*e*f/c^2*a*(c*x^2+b*x+a)^{(3/2)}+1/2*x*(c*x^2+b*x+a)^{(3/2)}/c*d*f-5/12*b/c^2*(c*x^2+b*x+a)^{(3/2)}*d*f+5/32*b^2/c^2*(c*x^2+b*x+a)^{(1/2)}*x*e^2+5/32*b^3/c^3*(c*x^2+b*x+a)^{(1/2)}*d*f+3/16*b^2/c^{(5/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*a*e^2-5/64*b^4/c^{(7/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*d*f-1/8/c*a*(c*x^2+b*x+a)^{(1/2)}*x*e^2-1/16/c^2*a*(c*x^2+b*x+a)^{(1/2)}*b*e^2-1/4/c^{(3/2)}*a^2*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})*d*f-1/4*d*e*b^2/c^2*(c*x^2+b*x+a)^{(1/2)}+1/8*d*e*b^3/c^{(5/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})-7/64*f^2*b^3/c^4*a*(c*x^2+b*x+a)^{(1/2)}-15/64*f^2*b^2/c^{(7/2)}*a^2*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})+49/240*f^2*b/c^3*a*(c*x^2+b*x+a)^{(3/2)}-1/8*f^2/c^2*a*x*(c*x^2+b*x+a)^{(3/2)}+1/16*f^2/c^2*a^2*(c*x^2+b*x+a)^{(1/2)}*x+1/32*f^2/c^3*a^2*(c*x^2+b*x+a)^{(1/2)}*b-3/20*f^2*b/c^2*x^2*(c*x^2+b*x+a)^{(3/2)}+21/160*f^2*b^2/c^3*x*(c*x^2+b*x+a)^{(3/2)}+21/256*f^2*b^2$$

$$\frac{4}{c^4} (c^2 x^2 + b^2 x + a)^{1/2} x + \frac{35}{256} f^2 b^4 / c^{9/2} \ln\left(\frac{1}{2} b + c^2 x\right) / c^{1/2} + (c^2 x^2 + b^2 x + a)^{1/2} a + \frac{1}{2} d^2 (c^2 x^2 + b^2 x + a)^{1/2} x$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2,x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 0.564142, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2,x, algorithm="fricas")

[Out] [1/30720*(4*(1280*c^5*f^2*x^5 + 1920*b*c^4*d^2 + 128*(24*c^5*e*f + b*c^4*f^2)*x^4 + 16*(120*c^5*e^2 - (9*b^2*c^3 - 20*a*c^4)*f^2 + 24*(10*c^5*d + b*c^4*e)*f)*x^3 - 640*(3*b^2*c^3 - 8*a*c^4)*d*e + 40*(15*b^3*c^2 - 52*a*b*c^3)*e^2 + (315*b^5 - 1680*a*b^3*c + 180*8*a^2*b*c^2)*f^2 + 8*(640*c^5*d*e + 40*b*c^4*e^2 + (21*b^3*c^2 - 68*a*b*c^3)*f^2 + 8*(10*b*c^4*d - (7*b^2*c^3 - 16*a*c^4)*e)*f)*x^2 + 8*(10*(15*b^3*c^2 - 52*a*b*c^3)*d - (105*b^4*c - 460*a*b^2*c^2 + 256*a^2*c^3)*e)*f + 2*(1920*c^5*d^2 + 640*b*c^4*d*e - 40*(5*b^2*c^3 - 12*a*c^4)*e^2 - (105*b^4*c - 448*a*b^2*c^2 + 240*a^2*c^3)*f^2 - 8*(10*(5*b^2*c^3 - 12*a*c^4)*d - (35*b^3*c^2 - 116*a*b*c^3)*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) - 15*(128*(b^2*c^4 - 4*a*c^5)*d^2 - 128*(b^3*c^3 - 4*a*b*c^4)*d*e + 8*(5*b^4*c^2 - 24*a*b^2*c^3 + 16*a^2*c^4)*e^2 + (21*b^6 - 140*a*b^4*c + 240*a^2*b^2*c^2 - 64*a^3*c^3)*f^2 + 8*(2*(5*b^4*c^2 - 24*a*b^2*c^3 + 16*a^2*c^4)*d - (7*b^5*c - 40*a*b^3*c^2 + 48*a^2*b*c^3)*e)*f)*log(-4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c^(11/2), 1/15360*(2*(1280*c^5*f^2*x^5 + 1920*b*c^4*d^2 + 128*(24*c^5*e*f + b*c^4*f^2)*x^4 + 16*(120*c^5*e^2 - (9*b^2*c^3 - 20*a*c^4)*f^2 + 24*(10*c^5*d + b*c^4*e)*f)*x^3 - 640*(3*b^2*c^3 - 8*a*c^4)*d*e + 40*(15*b^3*c^2 - 52*a*b*c^3)*e^2 + (315*b^5 - 1680*a*b^3*c + 1808*a^2*b*c^2)*f^2 + 8*(640*c^5*d*e + 40*b*c^4*e^2 + (21*b^3*c^2 - 68*a*b*c^3)*f^2 + 8*(10*b*c^4*d - (7*b^2*c^3 - 16*a*c^4)*e)*f)*x^2 + 8*(10*(15*b^3*c^2 - 52*a*b*c^3)*d - (105*b^4*c - 460*a*b^2*c^2 + 256*a^2*c^3)*e)*f + 2*(1920*c^5*d^2

$$\begin{aligned}
& + 640*b*c^4*d*e - 40*(5*b^2*c^3 - 12*a*c^4)*e^2 - (105*b^4*c - 44 \\
& 8*a*b^2*c^2 + 240*a^2*c^3)*f^2 - 8*(10*(5*b^2*c^3 - 12*a*c^4)*d - \\
& (35*b^3*c^2 - 116*a*b*c^3)*e)*f)*x)*\sqrt{c*x^2 + b*x + a}*\sqrt{(- \\
& c) - 15*(128*(b^2*c^4 - 4*a*c^5)*d^2 - 128*(b^3*c^3 - 4*a*b*c^4)* \\
& d*e + 8*(5*b^4*c^2 - 24*a*b^2*c^3 + 16*a^2*c^4)*e^2 + (21*b^6 - 1 \\
& 40*a*b^4*c + 240*a^2*b^2*c^2 - 64*a^3*c^3)*f^2 + 8*(2*(5*b^4*c^2 \\
& - 24*a*b^2*c^3 + 16*a^2*c^4)*d - (7*b^5*c - 40*a*b^3*c^2 + 48*a^2 \\
& *b*c^3)*e)*f)*\arctan(1/2*(2*c*x + b)*\sqrt{-c}/(\sqrt{c*x^2 + b*x + \\
& a*c}))/(\sqrt{-c}*c^5)]
\end{aligned}$$

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

$$\int \sqrt{a + bx + cx^2} (d + ex + fx^2)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d)**2,x)

[Out] Integral(sqrt(a + b*x + c*x**2)*(d + e*x + f*x**2)**2, x)

GIAC/XCAS [A] time = 0.280034, size = 861, normalized size = 1.97

$$\begin{aligned}
& \frac{1}{7680} \sqrt{cx^2 + bx + a} \left(2 \left(4 \left(2 \left(8 \left(10 f^2 x + \frac{bc^4 f^2 + 24 c^5 f e}{c^5} \right) x + \frac{240 c^5 d f - 9 b^2 c^3 f^2 + 20 a c^4 f^2 + 24 b c^4 f e + 120 c^5 e^2}{c^5} \right) x + \right. \right. \\
& \left. \left. (128 b^2 c^4 d^2 - 512 a c^5 d^2 + 80 b^4 c^2 d f - 384 a b^2 c^3 d f + 256 a^2 c^4 d f + 21 b^6 f^2 - 140 a b^4 c f^2 + 240 a^2 b^2 c^2 f^2 - 64 a^3 c^3 f^2 - 1 \right. \right. \\
& \left. \left. + \dots \right) \right)
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2,x, algorithm="giac")

[Out] 1/7680*sqrt(c*x^2 + b*x + a)*(2*(4*(2*(8*(10*f^2*x + (b*c^4*f^2 + 24*c^5*f*e)/c^5)*x + (240*c^5*d*f - 9*b^2*c^3*f^2 + 20*a*c^4*f^2 + 24*b*c^4*f*e + 120*c^5*e^2)/c^5)*x + (80*b*c^4*d*f + 21*b^3*c^4*2*f^2 - 68*a*b*c^3*f^2 + 640*c^5*d*e - 56*b^2*c^3*f*e + 128*a*c^4*f*e + 40*b*c^4*e^2)/c^5)*x + (1920*c^5*d^2 - 400*b^2*c^3*d*f + 960*a*c^4*d*f - 105*b^4*c*f^2 + 448*a*b^2*c^2*f^2 - 240*a^2*c^3*f^2 + 640*b*c^4*d*e + 280*b^3*c^2*f*e - 928*a*b*c^3*f*e - 200*b^2*c^3*e^2 + 480*a*c^4*e^2)/c^5)*x + (1920*b*c^4*d^2 + 1200*b^3*c^2*d*f - 4160*a*b*c^3*d*f + 315*b^5*f^2 - 1680*a*b^3*c*f^2 + 1808*a^2*b*c^2*f^2 - 1920*b^2*c^3*d*e + 5120*a*c^4*d*e - 840*b^4*c*f*e + 3680*a*b^2*c^2*f*e - 2048*a^2*c^3*f*e + 600*b^3*c^2*e^2 - 2080*a*

$$\begin{aligned}
& b^3 c^3 e^2 / c^5) + 1/1024 * (128 b^2 c^4 d^2 - 512 a c^5 d^2 + 80 b^4 \\
& c^2 d^2 f - 384 a b^2 c^3 d^2 f + 256 a^2 c^4 d^2 f + 21 b^6 f^2 - 14 \\
& 0 a b^4 c^2 f^2 + 240 a^2 b^2 c^2 f^2 - 64 a^3 c^3 f^2 - 128 b^3 c^3 \\
& d^2 e + 512 a b c^4 d^2 e - 56 b^5 c^2 f^2 e + 320 a b^3 c^2 f^2 e - 384 \\
& a^2 b c^3 f^2 e + 40 b^4 c^2 e^2 - 192 a b^2 c^3 e^2 + 128 a^2 c^4 \\
& e^2) * \ln(\text{abs}(-2 * (\text{sqrt}(c) * x - \text{sqrt}(c * x^2 + b * x + a)) * \text{sqrt}(c) - b)) / \\
& c^{11/2})
\end{aligned}$$

$$3.101 \quad \int \sqrt{a + bx + cx^2} (d + ex + fx^2) dx$$

Optimal. Leaf size=175

$$\begin{aligned} & \frac{(b^2 - 4ac) \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-4c(af + 2be) + 5b^2f + 16c^2d)}{128c^{7/2}} \\ & + \frac{(b + 2cx)\sqrt{a + bx + cx^2} (-4acf + 5b^2f - 8bce + 16c^2d)}{64c^3} \\ & + \frac{(a + bx + cx^2)^{3/2} (8ce - 5bf)}{24c^2} + \frac{fx (a + bx + cx^2)^{3/2}}{4c} \end{aligned}$$

[Out] $((16*c^2*d - 8*b*c*e + 5*b^2*f - 4*a*c*f)*(b + 2*c*x)*\text{Sqrt}[a + b*x + c*x^2])/(64*c^3) + ((8*c*e - 5*b*f)*(a + b*x + c*x^2)^{(3/2)})/(24*c^2) + (f*x*(a + b*x + c*x^2)^{(3/2)})/(4*c) - ((b^2 - 4*a*c)*(16*c^2*d + 5*b^2*f - 4*c*(2*b*e + a*f))*\text{ArcTanh}[(b + 2*c*x)/(2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2])])/(128*c^{(7/2)})$

Rubi [A] time = 0.33784, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\begin{aligned} & \frac{(b^2 - 4ac) \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-4c(af + 2be) + 5b^2f + 16c^2d)}{128c^{7/2}} \\ & + \frac{(b + 2cx)\sqrt{a + bx + cx^2} (-4acf + 5b^2f - 8bce + 16c^2d)}{64c^3} \\ & + \frac{(a + bx + cx^2)^{3/2} (8ce - 5bf)}{24c^2} + \frac{fx (a + bx + cx^2)^{3/2}}{4c} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[\text{Sqrt}[a + b*x + c*x^2]*(d + e*x + f*x^2), x]$

[Out] $((16*c^2*d - 8*b*c*e + 5*b^2*f - 4*a*c*f)*(b + 2*c*x)*\text{Sqrt}[a + b*x + c*x^2])/(64*c^3) + ((8*c*e - 5*b*f)*(a + b*x + c*x^2)^{(3/2)})/(24*c^2) + (f*x*(a + b*x + c*x^2)^{(3/2)})/(4*c) - ((b^2 - 4*a*c)*(16*c^2*d + 5*b^2*f - 4*c*(2*b*e + a*f))*\text{ArcTanh}[(b + 2*c*x)/(2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2])])/(128*c^{(7/2)})$

Rubi in Sympy [A] time = 20.4161, size = 160, normalized size = 0.91

$$-\frac{(a+bx+cx^2)^{\frac{3}{2}}\left(\frac{5bf}{2}-4ce-3cfx\right)}{12c^2} + \frac{(b+2cx)\sqrt{a+bx+cx^2}(-4acf+5b^2f-8bce+16c^2d)}{64c^3}$$

$$-\frac{(-4ac+b^2)(-4acf+5b^2f-8bce+16c^2d)\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{128c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d),x)`

[Out] `-(a + b*x + c*x**2)**(3/2)*(5*b*f/2 - 4*c*e - 3*c*f*x)/(12*c**2) + (b + 2*c*x)*sqrt(a + b*x + c*x**2)*(-4*a*c*f + 5*b**2*f - 8*b*c*e + 16*c**2*d)/(64*c**3) - (-4*a*c + b**2)*(-4*a*c*f + 5*b**2*f - 8*b*c*e + 16*c**2*d)*atanh((b + 2*c*x)/(2*sqrt(c)*sqrt(a + b*x + c*x**2)))/(128*c**(7/2))`

Mathematica [A] time = 0.296497, size = 171, normalized size = 0.98

$$\frac{2\sqrt{c}\sqrt{a+x(b+cx)}(4bc(2c(6d+2ex+fx^2)-13af)+8c^2(a(8e+3fx)+2cx(6d+4ex+3fx^2))+15b^3f-2b^2c(12e+3fx))}{384c^{7/2}}$$

Antiderivative was successfully verified.

[In] `Integrate[Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2),x]`

[Out] `(2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(15*b^3*f - 2*b^2*c*(12*e + 5*f*x) + 4*b*c*(-13*a*f + 2*c*(6*d + 2*e*x + f*x^2)) + 8*c^2*(a*(8*e + 3*f*x) + 2*c*x*(6*d + 4*e*x + 3*f*x^2))) - 3*(b^2 - 4*a*c)*(16*c^2*d + 5*b^2*f - 4*c*(2*b*e + a*f))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)])/(384*c^(7/2))`

Maple [B] time = 0.009, size = 453, normalized size = 2.6

$$\begin{aligned}
& \frac{dx}{2} \sqrt{cx^2 + bx + a} + \frac{bd}{4c} \sqrt{cx^2 + bx + a} + \frac{ad}{2} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) \frac{1}{\sqrt{c}} \\
& - \frac{b^2d}{8} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) c^{-\frac{3}{2}} + \frac{e}{3c} (cx^2 + bx + a)^{\frac{3}{2}} \\
& - \frac{bex}{4c} \sqrt{cx^2 + bx + a} - \frac{b^2e}{8c^2} \sqrt{cx^2 + bx + a} - \frac{abe}{4} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) c^{-\frac{3}{2}} \\
& + \frac{eb^3}{16} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) c^{-\frac{5}{2}} + \frac{fx}{4c} (cx^2 + bx + a)^{\frac{3}{2}} \\
& - \frac{5bf}{24c^2} (cx^2 + bx + a)^{\frac{3}{2}} + \frac{5b^2fx}{32c^2} \sqrt{cx^2 + bx + a} + \frac{5b^3f}{64c^3} \sqrt{cx^2 + bx + a} \\
& + \frac{3b^2fa}{16} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) c^{-\frac{5}{2}} \\
& - \frac{5fb^4}{128} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) c^{-\frac{7}{2}} - \frac{afx}{8c} \sqrt{cx^2 + bx + a} \\
& - \frac{abf}{16c^2} \sqrt{cx^2 + bx + a} - \frac{a^2f}{8} \ln \left(1 \left(\frac{b}{2} + cx \right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a} \right) c^{-\frac{3}{2}}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)^(1/2)*(f*x^2+e*x+d),x)`

[Out] $\frac{1}{2}d(c^2x^2+bx+a)^{1/2}x + \frac{1}{4}d/c(c^2x^2+bx+a)^{1/2}b + \frac{1}{2}d/c^{1/2} \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2})^2 a - \frac{1}{8}d/c^{3/2} \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2})^2 b^2 + \frac{1}{3}e(c^2x^2+bx+a)^{3/2}/c - \frac{1}{4}e^2b/c(c^2x^2+bx+a)^{1/2}x - \frac{1}{8}e^2b^2/c^2(c^2x^2+bx+a)^{1/2} - \frac{1}{4}e^2b/c^{3/2} \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2})^2 a + \frac{1}{16}e^2b^3/c^{5/2} \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2})^2 + \frac{1}{4}fx(c^2x^2+bx+a)^{3/2}/c - \frac{5}{24}f^2b/c^2(c^2x^2+bx+a)^{3/2} + \frac{5}{32}f^2b^2/c^2(c^2x^2+bx+a)^{1/2}x + \frac{5}{64}f^2b^3/c^3(c^2x^2+bx+a)^{1/2} + \frac{3}{16}f^2b^2/c^{5/2} \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2})^2 a - \frac{5}{128}f^2b^4/c^{7/2} \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2}) - \frac{1}{8}f/c^2a(c^2x^2+bx+a)^{1/2}x - \frac{1}{16}f/c^2a^2(c^2x^2+bx+a)^{1/2}b - \frac{1}{8}f/c^{3/2}a^2 \ln((1/2b+cx)/c^{1/2} + (c^2x^2+bx+a)^{1/2})$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 0.306603, size = 1, normalized size = 0.01

$$\frac{4(48c^3fx^3 + 48bc^2d + 8(8c^3e + bc^2f)x^2 - 8(3b^2c - 8ac^2)e + (15b^3 - 52abc)f + 2(48c^3d + 8bc^2e - (5b^2c - 12ac^2))}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d), x, algorithm="fricas")

[Out] [1/768*(4*(48*c^3*f*x^3 + 48*b*c^2*d + 8*(8*c^3*e + b*c^2*f)*x^2 - 8*(3*b^2*c - 8*a*c^2)*e + (15*b^3 - 52*a*b*c)*f + 2*(48*c^3*d + 8*b*c^2*e - (5*b^2*c - 12*a*c^2)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) + 3*(16*(b^2*c^2 - 4*a*c^3)*d - 8*(b^3*c - 4*a*b*c^2)*e + (5*b^4 - 24*a*b^2*c + 16*a^2*c^2)*f)*log(4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c^(7/2), 1/384*(2*(48*c^3*f*x^3 + 48*b*c^2*d + 8*(8*c^3*e + b*c^2*f)*x^2 - 8*(3*b^2*c - 8*a*c^2)*e + (15*b^3 - 52*a*b*c)*f + 2*(48*c^3*d + 8*b*c^2*e - (5*b^2*c - 12*a*c^2)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) - 3*(16*(b^2*c^2 - 4*a*c^3)*d - 8*(b^3*c - 4*a*b*c^2)*e + (5*b^4 - 24*a*b^2*c + 16*a^2*c^2)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/(sqrt(-c)*c^3)]

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

$$\int \sqrt{a + bx + cx^2} (d + ex + fx^2) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d), x)

[Out] Integral(sqrt(a + b*x + c*x**2)*(d + e*x + f*x**2), x)

GIAC/XCAS [A] time = 0.27789, size = 286, normalized size = 1.63

$$\frac{1}{192} \sqrt{cx^2 + bx + a} \left(2 \left(4 \left(6fx + \frac{bc^2f + 8c^3e}{c^3} \right) x + \frac{48c^3d - 5b^2cf + 12ac^2f + 8bc^2e}{c^3} \right) x + \frac{48bc^2d + 15b^3f - 52abcf - 24a^2c^2d - 8b^3ce + 32abc^2e}{c^3} \right) + \frac{(16b^2c^2d - 64ac^3d + 5b^4f - 24ab^2cf + 16a^2c^2f - 8b^3ce + 32abc^2e) \ln \left(\left| -2 \left(\sqrt{cx} - \sqrt{cx^2 + bx + a} \right) \sqrt{c} - b \right| \right)}{128c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d),x, algorithm="giac")

[Out] 1/192*sqrt(c*x^2 + b*x + a)*(2*(4*(6*f*x + (b*c^2*f + 8*c^3*e)/c^3)*x + (48*c^3*d - 5*b^2*c*f + 12*a*c^2*f + 8*b*c^2*e)/c^3)*x + (48*b*c^2*d + 15*b^3*f - 52*a*b*c*f - 24*b^2*c*e + 64*a*c^2*e)/c^3) + 1/128*(16*b^2*c^2*d - 64*a*c^3*d + 5*b^4*f - 24*a*b^2*c*f + 16*a^2*c^2*f - 8*b^3*c*e + 32*a*b*c^2*e)*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(7/2)

$$3.102 \quad \int \frac{\sqrt{a+bx+cx^2}}{d+ex+fx^2} dx$$

Optimal. Leaf size=431

$$\frac{\sqrt{f(2af - b(e - \sqrt{e^2 - 4df}))} + c(-e\sqrt{e^2 - 4df} - 2df + e^2) \tanh^{-1}\left(\frac{4af+2x(bf-c(e-\sqrt{e^2-4df}))-b(e-\sqrt{e^2-4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2f}\sqrt{e^2 - 4df}} + \frac{\sqrt{f(2af - b(\sqrt{e^2 - 4df} + e))} + c(e\sqrt{e^2 - 4df} - 2df + e^2) \tanh^{-1}\left(\frac{4af+2x(bf-c(\sqrt{e^2-4df}+e))-b(\sqrt{e^2-4df}+e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2f}\sqrt{e^2 - 4df}} + \frac{\sqrt{c} \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f}$$

[Out] (Sqrt[c]*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2]))/f - (Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f]))]*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2]))/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f]) + (Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2]))/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f])

Rubi [A] time = 2.37932, antiderivative size = 431, normalized size of antiderivative = 1., number of rules used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{\sqrt{f(2af - b(e - \sqrt{e^2 - 4df}))} + c(-e\sqrt{e^2 - 4df} - 2df + e^2) \tanh^{-1}\left(\frac{4af+2x(bf-c(e-\sqrt{e^2-4df}))-b(e-\sqrt{e^2-4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2f}\sqrt{e^2 - 4df}} + \frac{\sqrt{f(2af - b(\sqrt{e^2 - 4df} + e))} + c(e\sqrt{e^2 - 4df} - 2df + e^2) \tanh^{-1}\left(\frac{4af+2x(bf-c(\sqrt{e^2-4df}+e))-b(\sqrt{e^2-4df}+e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2f}\sqrt{e^2 - 4df}} + \frac{\sqrt{c} \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f}$$

Antiderivative was successfully verified.

[In] Int[Sqrt[a + b*x + c*x^2]/(d + e*x + f*x^2),x]

[Out] (Sqrt[c]*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2]))/f - (Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f]))]*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2]))/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f]) + (Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2]))/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f])

Rubi in Sympy [A] time = 157.729, size = 420, normalized size = 0.97

$$\frac{\sqrt{c} \operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f} + \frac{\sqrt{2}\sqrt{2af^2 - bef - bf\sqrt{-4df + e^2} - 2cdf + ce^2 + ce\sqrt{-4df + e^2}} \operatorname{atanh}\left(\frac{\sqrt{2}(4af - b(e + \sqrt{-4df + e^2}) + x)(2bf - 2c(e + \sqrt{-4df + e^2}))}{4\sqrt{a+bx+cx^2}\sqrt{2af^2 - bef - 2cdf + ce^2 - (bf - ce)\sqrt{-4df + e^2}}}\right)}{2f\sqrt{-4df + e^2}} - \frac{\sqrt{2}\sqrt{2af^2 - bef + bf\sqrt{-4df + e^2} - 2cdf + ce^2 - ce\sqrt{-4df + e^2}} \operatorname{atanh}\left(\frac{\sqrt{2}(4af - be + b\sqrt{-4df + e^2} + x)(2bf - 2ce + 2c\sqrt{-4df + e^2})}{4\sqrt{a+bx+cx^2}\sqrt{2af^2 - bef - 2cdf + ce^2 + (bf - ce)\sqrt{-4df + e^2}}}\right)}{2f\sqrt{-4df + e^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d),x)

[Out] sqrt(c)*atanh((b + 2*c*x)/(2*sqrt(c)*sqrt(a + b*x + c*x**2)))/f + sqrt(2)*sqrt(2*a*f**2 - b*e*f - b*f*sqrt(-4*d*f + e**2) - 2*c*d*f + c*e**2 + c*e*sqrt(-4*d*f + e**2))*atanh(sqrt(2)*(4*a*f - b*(e + sqrt(-4*d*f + e**2)) + x*(2*b*f - 2*c*(e + sqrt(-4*d*f + e**2))))/(4*sqrt(a + b*x + c*x**2)*sqrt(2*a*f**2 - b*e*f - 2*c*d*f + c*e**2 - (b*f - c*e)*sqrt(-4*d*f + e**2))))/(2*f*sqrt(-4*d*f + e**2)) - sqrt(2)*sqrt(2*a*f**2 - b*e*f + b*f*sqrt(-4*d*f + e**2) - 2*c*d*f + c*e**2 - c*e*sqrt(-4*d*f + e**2))*atanh(sqrt(2)*(4*a*f - b*e + b*sqrt(-4*d*f + e**2) + x*(2*b*f - 2*c*e + 2*c*sqrt(-4*d*f + e**2))))/(4*sqrt(a + b*x + c*x**2)*sqrt(2*a*f**2 - b*e*f - 2*c*d*f + c*e**2 + (b*f - c*e)*sqrt(-4*d*f + e**2))))/(2*f*sqrt(-4*d*f + e**2))

Mathematica [A] time = 5.2834, size = 699, normalized size = 1.62

$$\sqrt{2} \log \left(\sqrt{e^2 - 4df} - e - 2fx \right) \sqrt{f \left(2af + b\sqrt{e^2 - 4df} + b(-e) \right) + c \left(-e\sqrt{e^2 - 4df} - 2df + e^2 \right)} - \sqrt{2} \log \left(\sqrt{e^2 - 4df} + e \right)$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[a + b*x + c*x^2]/(d + e*x + f*x^2), x]

[Out] (Sqrt[2]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x] - Sqrt[2]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x] + 2*Sqrt[c]*Sqrt[e^2 - 4*d*f]*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)]] - Sqrt[2]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Log[4*a*f*Sqrt[e^2 - 4*d*f] + 2*c*e^2*x - 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + b*(e^2 - 4*d*f - e*Sqrt[e^2 - 4*d*f] + 2*f*Sqrt[e^2 - 4*d*f]*x) + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Sqrt[a + x*(b + c*x)]] + Sqrt[2]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*Log[4*a*f*Sqrt[e^2 - 4*d*f] - 2*c*e^2*x + 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*Sqrt[a + x*(b + c*x)] - b*(e^2 + e*Sqrt[e^2 - 4*d*f] - 2*f*(2*d + Sqrt[e^2 - 4*d*f]*x)))]/(2*f*Sqrt[e^2 - 4*d*f])

Maple [B] time = 0.091, size = 6019, normalized size = 14.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d), x)

[Out] result too large to display

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d),x, algorithm="fricas")
```

```
[Out] Timed out
```

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

$$\int \frac{\sqrt{a + bx + cx^2}}{d + ex + fx^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d),x)
```

```
[Out] Integral(sqrt(a + b*x + c*x**2)/(d + e*x + f*x**2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError
```

$$3.103 \quad \int \frac{\sqrt{a+bx+cx^2}}{(d+ex+fx^2)^2} dx$$

Optimal. Leaf size=488

$$\frac{\left(f(be - 4af) - \left(e - \sqrt{e^2 - 4df} \right) (ce - bf) \right) \tanh^{-1} \left(\frac{4af + 2x(bf - c(e - \sqrt{e^2 - 4df})) - b(e - \sqrt{e^2 - 4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} \right)}{\sqrt{2}(e^2 - 4df)^{3/2} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} + \frac{\left(f(be - 4af) - \left(\sqrt{e^2 - 4df} + e \right) (ce - bf) \right) \tanh^{-1} \left(\frac{4af + 2x(bf - c(\sqrt{e^2 - 4df} + e)) - b(\sqrt{e^2 - 4df} + e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} \right)}{\sqrt{2}(e^2 - 4df)^{3/2} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} - \frac{(e + 2fx)\sqrt{a + bx + cx^2}}{(e^2 - 4df)(d + ex + fx^2)}$$

[Out] -(((e + 2*f*x)*Sqrt[a + b*x + c*x^2])/((e^2 - 4*d*f)*(d + e*x + f*x^2))) - ((f*(b*e - 4*a*f) - (c*e - b*f)*(e - Sqrt[e^2 - 4*d*f]))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f])*Sqrt[a + b*x + c*x^2]))]/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + ((f*(b*e - 4*a*f) - (c*e - b*f)*(e + Sqrt[e^2 - 4*d*f]))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2]))/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])

Rubi [A] time = 7.22224, antiderivative size = 488, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{\left(f(be - 4af) - \left(e - \sqrt{e^2 - 4df} \right) (ce - bf) \right) \tanh^{-1} \left(\frac{4af + 2x(bf - c(e - \sqrt{e^2 - 4df})) - b(e - \sqrt{e^2 - 4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} \right)}{\sqrt{2}(e^2 - 4df)^{3/2} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} + \frac{\left(f(be - 4af) - \left(\sqrt{e^2 - 4df} + e \right) (ce - bf) \right) \tanh^{-1} \left(\frac{4af + 2x(bf - c(\sqrt{e^2 - 4df} + e)) - b(\sqrt{e^2 - 4df} + e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} \right)}{\sqrt{2}(e^2 - 4df)^{3/2} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} - \frac{(e + 2fx)\sqrt{a + bx + cx^2}}{(e^2 - 4df)(d + ex + fx^2)}$$

Warning: Unable to verify antiderivative.

[In] Int[Sqrt[a + b*x + c*x^2]/(d + e*x + f*x^2)^2,x]

[Out]
$$-\left(\frac{(e + 2fx)\sqrt{ax^2 + bx + c}}{(e^2 - 4df)(d + ex + fx^2)} - \frac{(f(b^2e - 4a^2f) - (ce - bf)(e - \sqrt{e^2 - 4df})) \operatorname{ArcTanh}\left(\frac{4a^2f - b(e - \sqrt{e^2 - 4df}) + 2(bf - c)(e - \sqrt{e^2 - 4df})}{2\sqrt{2}\sqrt{ce^2 - 2cdf - b^2ef + 2a^2f^2 - (ce - bf)\sqrt{e^2 - 4df}}}\right)}{2\sqrt{2}\sqrt{ce^2 - 2cdf - b^2ef + 2a^2f^2 - (ce - bf)\sqrt{e^2 - 4df}}}\right) + \left(\frac{(f(b^2e - 4a^2f) - (ce - bf)(e + \sqrt{e^2 - 4df})) \operatorname{ArcTanh}\left(\frac{4a^2f - b(e + \sqrt{e^2 - 4df}) + 2(bf - c)(e + \sqrt{e^2 - 4df})}{2\sqrt{2}\sqrt{ce^2 - 2cdf - b^2ef + 2a^2f^2 + (ce - bf)\sqrt{e^2 - 4df}}}\right)}{2\sqrt{2}\sqrt{ce^2 - 2cdf - b^2ef + 2a^2f^2 + (ce - bf)\sqrt{e^2 - 4df}}}\right)$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)

[Out] Timed out

Mathematica [A] time = 3.04353, size = 798, normalized size = 1.64

$$\frac{\sqrt{a+x(b+cx)}(e+2fx)}{(e^2-4df)(d+x(e+fx))} + \frac{\left(ce\left(\sqrt{e^2-4df}-e\right)-f\left(4af+b\left(\sqrt{e^2-4df}-2e\right)\right)\right)\log\left(-e-2fx+\sqrt{e^2-4df}\right)}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af+b\left(\sqrt{e^2-4df}-e\right)\right)}} + \frac{\left(ce\left(e+\sqrt{e^2-4df}\right)+f\left(4af-b\left(2e+\sqrt{e^2-4df}\right)\right)\right)\log\left(e+2fx+\sqrt{e^2-4df}\right)}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2+\sqrt{e^2-4df}e-2df\right)+f\left(2af-b\left(e+\sqrt{e^2-4df}\right)\right)}} + \frac{\left(ce\left(e+\sqrt{e^2-4df}\right)+f\left(4af-b\left(2e+\sqrt{e^2-4df}\right)\right)\right)\log\left(-4af+2cex+2c\sqrt{e^2-4df}x+b\left(e-2fx+\sqrt{e^2-4df}\right)\right)}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2+\sqrt{e^2-4df}e-2df\right)+f\left(2af-b\left(e+\sqrt{e^2-4df}\right)\right)}} - \frac{\left(ce\left(\sqrt{e^2-4df}-e\right)-f\left(4af+b\left(\sqrt{e^2-4df}-2e\right)\right)\right)\log\left(b\left(-e+2fx+\sqrt{e^2-4df}\right)+2\left(2af-cex+c\sqrt{e^2-4df}x\right)\right)}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af-b\left(e+\sqrt{e^2-4df}\right)\right)}}$$

Antiderivative was successfully verified.

[In] Integrate[Sqrt[a + b*x + c*x^2]/(d + e*x + f*x^2)^2,x]

[Out] -(((e + 2*f*x)*Sqrt[a + x*(b + c*x)])/((e^2 - 4*d*f)*(d + x*(e + f*x)))) + (((c*e*(-e + Sqrt[e^2 - 4*d*f]) - f*(4*a*f + b*(-2*e + Sqrt[e^2 - 4*d*f]))) * Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x]) / (Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f + b*(-e + Sqrt[e^2 - 4*d*f]))]) + (((c*e*(e + Sqrt[e^2 - 4*d*f]) + f*(4*a*f - b*(2*e + Sqrt[e^2 - 4*d*f]))) * Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x]) / (Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]) - (((c*e*(e + Sqrt[e^2 - 4*d*f]) + f*(4*a*f - b*(2*e + Sqrt[e^2 - 4*d*f]))) * Log[-4*a*f + 2*c*e*x + 2*c*Sqrt[e^2 - 4*d*f]*x + b*(e + Sqrt[e^2 - 4*d*f] - 2*f*x) - 2*Sqrt[2]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]) * Sqrt[a + x*(b + c*x)]) / (Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]) - (((c*e*(-e + Sqrt[e^2 - 4*d*f]) - f*(4*a*f + b*(-2*e + Sqrt[e^2 - 4*d*f]))) * Log[b*(-e + Sqrt[e^2 - 4*d*f] + 2*f*x) + 2*(2*a*f - c*e*x + c*Sqrt[e^2 - 4*d*f]*x + Sqrt[2]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]) * Sqrt[a + x*(b + c*x)]) / (Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f + b*(-e + Sqrt[e^2 - 4*d*f]))])

Maple [B] time = 0.059, size = 22287, normalized size = 45.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d)^2,x)`

[Out] result too large to display

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

$$\int \frac{\sqrt{cx^2 + bx + a}}{(fx^2 + ex + d)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d)^2,x, algorithm="maxima")`

[Out] `integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d)^2, x)`

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d)^2,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((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)`

[Out] Timed out

GIAC/XCAS [A] time = 0.798802, size = 4, normalized size = 0.01

sage₀x

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d)^2,x, algorithm="giac")`

[Out] `sage0x`

$$3.104 \quad \int (a + bx + cx^2)^{3/2} (d + ex + fx^2)^2 dx$$

Optimal. Leaf size=564

$$\frac{(b^2 - 4ac)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128c^3 (a (2df + e^2) + 6bde))}{32768c^{13/2}}$$

$$+ \frac{(b^2 - 4ac) (b + 2cx)\sqrt{a + bx + cx^2} (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128c^3 (a (2df + e^2) + 6bde))}{16384c^6}$$

$$+ \frac{(b + 2cx) (a + bx + cx^2)^{3/2} (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128c^3 (a (2df + e^2) + 6bde))}{6144c^5}$$

$$+ \frac{(a + bx + cx^2)^{5/2} (-32c^2 (48aef + 49b (2df + e^2)) + 36bcf(31af + 56be) - 693b^3 f^2 + 5376c^3 de)}{13440c^4}$$

$$+ \frac{x (a + bx + cx^2)^{5/2} (-12cf(7af + 24be) + 99b^2 f^2 + 224c^2 (2df + e^2))}{1344c^3}$$

$$+ \frac{fx^2 (a + bx + cx^2)^{5/2} (32ce - 11bf)}{112c^2} + \frac{f^2 x^3 (a + bx + cx^2)^{5/2}}{8c}$$

[Out] $-\left((b^2 - 4ac) \cdot (768c^4 d^2 + 99b^4 f^2 - 72b^2 c f (4b^2 e + 3a^2 f) - 128c^3 (6b^2 d e + a(e^2 + 2df))) + 16c^2 (24a^2 b^2 e f + 3a^2 f^2 + 14b^2 (e^2 + 2df))\right) \cdot (b + 2cx) \cdot \text{Sqrt}[a + bx + cx^2] / (16384c^6) + \left((768c^4 d^2 + 99b^4 f^2 - 72b^2 c f (4b^2 e + 3a^2 f) - 128c^3 (6b^2 d e + a(e^2 + 2df))) + 16c^2 (24a^2 b^2 e f + 3a^2 f^2 + 14b^2 (e^2 + 2df))\right) \cdot (b + 2cx) \cdot (a + bx + cx^2)^{3/2} / (6144c^5) + \left((5376c^3 d e - 693b^3 f^2 + 36b^2 c f (56b^2 e + 31a^2 f) - 32c^2 (48a^2 e f + 49b^2 (e^2 + 2df)))\right) \cdot (a + bx + cx^2)^{5/2} / (13440c^4) + \left((99b^2 f^2 - 12c^2 f (24b^2 e + 7a^2 f) + 224c^2 (e^2 + 2df))\right) \cdot x \cdot (a + bx + cx^2)^{5/2} / (1344c^3) + \left(f (32c^2 e - 11b^2 f)\right) \cdot x^2 \cdot (a + bx + cx^2)^{5/2} / (112c^2) + \left(f^2 x^3 (a + bx + cx^2)^{5/2}\right) / (8c) + \left((b^2 - 4ac)^2 \cdot (768c^4 d^2 + 99b^4 f^2 - 72b^2 c f (4b^2 e + 3a^2 f) - 128c^3 (6b^2 d e + a(e^2 + 2df))) + 16c^2 (24a^2 b^2 e f + 3a^2 f^2 + 14b^2 (e^2 + 2df))\right) \cdot \text{ArcTanh}[(b + 2cx) / (2\sqrt{c} \sqrt{a + bx + cx^2})] / (32768c^{13/2})$

Rubi [A] time = 2.0149, antiderivative size = 564, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{(b^2 - 4ac)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128c^3 (a (2df + e^2)))}{32768c^{13/2}}$$

$$+ \frac{(b^2 - 4ac) (b + 2cx)\sqrt{a + bx + cx^2} (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128c^3 (a (2df + e^2) + 6bde))}{16384c^6}$$

$$+ \frac{(b + 2cx) (a + bx + cx^2)^{3/2} (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128c^3 (a (2df + e^2) + 6bde))}{6144c^5}$$

$$+ \frac{(a + bx + cx^2)^{5/2} (-32c^2 (48aef + 49b (2df + e^2)) + 36bcf(31af + 56be) - 693b^3 f^2 + 5376c^3 de)}{13440c^4}$$

$$+ \frac{x (a + bx + cx^2)^{5/2} (-12cf(7af + 24be) + 99b^2 f^2 + 224c^2 (2df + e^2))}{1344c^3}$$

$$+ \frac{fx^2 (a + bx + cx^2)^{5/2} (32ce - 11bf)}{112c^2} + \frac{f^2 x^3 (a + bx + cx^2)^{5/2}}{8c}$$

Antiderivative was successfully verified.

[In] Int[(a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2)^2,x]

[Out] $-\left((b^2 - 4ac) \cdot (768c^4 d^2 + 99b^4 f^2 - 72b^2 c f (4b^2 e + 3a^2 f) - 128c^3 (6b^2 d e + a(e^2 + 2df))) + 16c^2 (24ab^2 e f + 3a^2 f^2 + 14b^2 (e^2 + 2df))\right) \cdot (b + 2cx) \cdot \text{Sqrt}[a + bx + cx^2] / (16384c^6) + \left((768c^4 d^2 + 99b^4 f^2 - 72b^2 c f (4b^2 e + 3a^2 f) - 128c^3 (6b^2 d e + a(e^2 + 2df))) + 16c^2 (24ab^2 e f + 3a^2 f^2 + 14b^2 (e^2 + 2df))\right) \cdot (b + 2cx) \cdot (a + bx + cx^2)^{3/2} / (6144c^5) + \left((5376c^3 d e - 693b^3 f^2 + 36b^2 c f (56b^2 e + 31a^2 f) - 32c^2 (48a^2 e f + 49b^2 (e^2 + 2df)))\right) \cdot (a + bx + cx^2)^{5/2} / (13440c^4) + \left((99b^2 f^2 - 12c^2 f (24b^2 e + 7a^2 f) + 224c^2 (e^2 + 2df))\right) \cdot x \cdot (a + bx + cx^2)^{5/2} / (1344c^3) + \left(f (32c^2 e - 11b^2 f)\right) \cdot x^2 \cdot (a + bx + cx^2)^{5/2} / (112c^2) + \left(f^2 x^3 (a + bx + cx^2)^{5/2}\right) / (8c) + \left((b^2 - 4ac)^2 (768c^4 d^2 + 99b^4 f^2 - 72b^2 c f (4b^2 e + 3a^2 f) - 128c^3 (6b^2 d e + a(e^2 + 2df))) + 16c^2 (24ab^2 e f + 3a^2 f^2 + 14b^2 (e^2 + 2df))\right) \cdot \text{ArcTanh}[(b + 2cx) / (2\sqrt{c} \sqrt{a + bx + cx^2})] / (32768c^{13/2})$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(3/2)*(f*x**2+e*x+d)**2,x)

[Out] Timed out

Mathematica [A] time = 3.71328, size = 766, normalized size = 1.36

$$105 (b^2 - 4ac)^2 \log\left(2\sqrt{c}\sqrt{a + x(b + cx)} + b + 2cx\right) (16c^2 (3a^2 f^2 + 24abef + 14b^2 (2df + e^2)) - 72b^2 cf(3af + 4be) - 128$$

Antiderivative was successfully verified.

[In] Integrate[(a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2)^2,x]

[Out] $(-2*\text{Sqrt}[c]*\text{Sqrt}[a + x*(b + c*x)]*(10395*b^7*f^2 - 630*b^6*c*f*(48*e + 11*f*x) + 84*b^5*c*(-1095*a*f^2 + c*(280*e^2 + 560*d*f + 240*e*f*x + 66*f^2*x^2)) - 8*b^4*c^2*(560*c*d*(18*e + 7*f*x) - 63*a*f*(480*e + 107*f*x) + 2*c*x*(980*e^2 + 1008*e*f*x + 297*f^2*x^2)) + 16*b^3*c^2*(15309*a^2*f^2 - 4*a*c*(2660*e^2 + 5320*d*f + 2184*e*f*x + 585*f^2*x^2) + 8*c^2*(630*d^2 + 28*d*x*(15*e + 7*f*x) + x^2*(98*e^2 + 108*e*f*x + 33*f^2*x^2))) - 96*b^2*c^3*(a^2*f*(5488*e + 1181*f*x) + 8*c^2*x*(70*d^2 + 28*d*x*(2*e + f*x) + x^2*(14*e^2 + 16*e*f*x + 5*f^2*x^2)) - 4*a*c*(56*d*(25*e + 9*f*x) + x*(252*e^2 + 248*e*f*x + 71*f^2*x^2))) - 64*b*c^3*(2757*a^3*f^2 - 6*a^2*c*(756*e^2 + 584*e*f*x + f*(1512*d + 151*f*x^2)) + 24*a*c^2*(350*d^2 + 28*d*x*(7*e + 3*f*x) + x^2*(42*e^2 + 44*e*f*x + 13*f^2*x^2)) + 16*c^3*x^2*(630*d^2 + 28*d*x*(33*e + 26*f*x) + x^2*(364*e^2 + 600*e*f*x + 255*f^2*x^2))) - 128*c^4*(-3*a^3*f*(512*e + 105*f*x) + 16*c^3*x^3*(210*d^2 + 56*d*x*(6*e + 5*f*x) + 5*x^2*(28*e^2 + 48*e*f*x + 21*f^2*x^2)) + 6*a^2*c*(56*d*(16*e + 5*f*x) + x*(140*e^2 + 128*e*f*x + 35*f^2*x^2)) + 8*a*c^2*x*(1050*d^2 + 28*d*x*(48*e + 35*f*x) + x^2*(490*e^2 + 768*e*f*x + 315*f^2*x^2)))) + 105*(b^2 - 4*a*c)^2*(768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b*e + 3*a*f) - 128*c^3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*b*e*f + 3*a^2*f^2 + 14*b^2*(e^2 + 2*d*f))) * Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)]] / (3440640*c^(13/2))$

Maple [B] time = 0.031, size = 2458, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)^(3/2)*(f*x^2+e*x+d)^2,x)

[Out] $3/16*e*f*b/c^2*a^2*(c*x^2+b*x+a)^(1/2)*x - 3/16*e*f*b^3/c^3*(c*x^2+b*x+a)^(1/2)*x^a + 1/8*e*f*b/c^2*a*(c*x^2+b*x+a)^(3/2)*x + 1/4*b^2/c^2$

$$\begin{aligned}
& 2 * (c * x^2 + b * x + a)^{(1/2)} * x * a * d * f - 3/8 * d * e * b / c * (c * x^2 + b * x + a)^{(1/2)} * x * a \\
& + 1/8 * f^2 * x^3 * (c * x^2 + b * x + a)^{(5/2)} / c - 15/64 * e * f * b^3 / c^{(7/2)} * \ln((1/2 * \\
& b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a^2 + 21/256 * e * f * b^5 / c^{(9/2)} * \ln \\
& ((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a - 3/14 * e * f * b / c^2 * x * (c * x \\
& ^2 + b * x + a)^{(5/2)} - 3/32 * e * f * b^3 / c^3 * (c * x^2 + b * x + a)^{(3/2)} * x + 9/256 * e * f * \\
& b^5 / c^4 * (c * x^2 + b * x + a)^{(1/2)} * x - 3/32 * e * f * b^4 / c^4 * (c * x^2 + b * x + a)^{(1/2)} \\
&) * a + 1/16 * e * f * b^2 / c^3 * a * (c * x^2 + b * x + a)^{(3/2)} + 3/32 * e * f * b^2 / c^3 * a^2 * (\\
& c * x^2 + b * x + a)^{(1/2)} - 9/128 * f^2 * b^2 / c^3 * a * (c * x^2 + b * x + a)^{(3/2)} * x - 57/5 \\
& 12 * f^2 * b^2 / c^3 * a^2 * (c * x^2 + b * x + a)^{(1/2)} * x + 153/2048 * f^2 * b^4 / c^4 * (c * \\
& x^2 + b * x + a)^{(1/2)} * x * a + 7/48 * b^2 / c^2 * (c * x^2 + b * x + a)^{(3/2)} * x * d * f + 1/8 * b \\
& ^2 / c^2 * (c * x^2 + b * x + a)^{(1/2)} * x * a * e^2 - 7/128 * b^4 / c^3 * (c * x^2 + b * x + a)^{(1 \\
& /2)} * x * d * f + 1/8 * b^3 / c^3 * (c * x^2 + b * x + a)^{(1/2)} * a * d * f + 9/32 * b^2 / c^{(5/2)} * \\
& \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a^2 * d * f - 15/128 * b^4 / c^{(7/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a * d * f - 1/12 / c * a * \\
& (c * x^2 + b * x + a)^{(3/2)} * x * d * f - 1/24 / c^2 * a * (c * x^2 + b * x + a)^{(3/2)} * b * d * f - 1/ \\
& 8 / c * a^2 * (c * x^2 + b * x + a)^{(1/2)} * x * d * f - 1/16 / c^2 * a^2 * (c * x^2 + b * x + a)^{(1/2)} \\
&) * b * d * f - 1/4 * d * e * b / c * (c * x^2 + b * x + a)^{(3/2)} * x + 3/32 * d * e * b^3 / c^2 * (c * x^2 \\
& + b * x + a)^{(1/2)} * x - 3/16 * d * e * b^2 / c^2 * (c * x^2 + b * x + a)^{(1/2)} * a - 3/8 * d * e * b / \\
& c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a^2 + 3/16 * d * e * \\
& b^3 / c^{(5/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a + 3/16 * e * \\
& f * b / c^{(5/2)} * a^3 * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) + 3/8 * d \\
& ^2 / c^{(1/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a^2 + 2/5 * d * \\
& e * (c * x^2 + b * x + a)^{(5/2)} / c + 1/6 * x * (c * x^2 + b * x + a)^{(5/2)} / c * e^2 - 7/60 * b / c^2 * \\
& (c * x^2 + b * x + a)^{(5/2)} * e^2 + 7/192 * b^3 / c^3 * (c * x^2 + b * x + a)^{(3/2)} * e^2 - 7 \\
& / 512 * b^5 / c^4 * (c * x^2 + b * x + a)^{(1/2)} * e^2 + 7/1024 * b^6 / c^{(9/2)} * \ln((1/2 * b \\
& + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * e^2 - 1/16 / c^{(3/2)} * a^3 * \ln((1/2 * b \\
& + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * e^2 - 99/16384 * f^2 * b^7 / c^6 * (c * x^2 \\
& + b * x + a)^{(1/2)} + 99/32768 * f^2 * b^8 / c^{(13/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (\\
& c * x^2 + b * x + a)^{(1/2)}) + 3/128 * f^2 / c^{(5/2)} * a^4 * \ln((1/2 * b + c * x) / c^{(1/2)} + \\
& (c * x^2 + b * x + a)^{(1/2)}) - 33/640 * f^2 * b^3 / c^4 * (c * x^2 + b * x + a)^{(5/2)} + 33/20 \\
& 48 * f^2 * b^5 / c^5 * (c * x^2 + b * x + a)^{(3/2)} + 3/128 * d^2 / c^{(5/2)} * \ln((1/2 * b + c * \\
& x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * b^4 + 1/8 * d^2 / c * (c * x^2 + b * x + a)^{(3/2)} \\
& * b + 3/8 * d^2 * (c * x^2 + b * x + a)^{(1/2)} * x * a - 3/64 * d^2 / c^2 * (c * x^2 + b * x + a)^{(1/ \\
& 2)} * b^3 - 15/128 * f^2 * b^2 / c^{(7/2)} * a^3 * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b \\
& * x + a)^{(1/2)}) + 33/448 * f^2 * b^2 / c^3 * x * (c * x^2 + b * x + a)^{(5/2)} + 33/1024 * f^2 \\
& * b^4 / c^4 * (c * x^2 + b * x + a)^{(3/2)} * x + 105/1024 * f^2 * b^4 / c^{(9/2)} * \ln((1/2 * b \\
& + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a^2 - 63/2048 * f^2 * b^6 / c^{(11/2)} * \ln \\
& ((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a + 3/128 * f^2 / c^2 * a^3 * (c \\
& * x^2 + b * x + a)^{(1/2)} * x + 3/256 * f^2 / c^3 * a^3 * (c * x^2 + b * x + a)^{(1/2)} * b - 1/16 * \\
& f^2 / c^2 * a * x * (c * x^2 + b * x + a)^{(5/2)} + 1/64 * f^2 / c^2 * a^2 * (c * x^2 + b * x + a)^{(3 \\
& /2)} * x + 1/128 * f^2 / c^3 * a^2 * (c * x^2 + b * x + a)^{(3/2)} * b - 99/8192 * f^2 * b^6 / c^5 \\
& * (c * x^2 + b * x + a)^{(1/2)} * x + 153/4096 * f^2 * b^5 / c^5 * (c * x^2 + b * x + a)^{(1/2)} * a \\
& - 9/256 * f^2 * b^3 / c^4 * a * (c * x^2 + b * x + a)^{(3/2)} - 57/1024 * f^2 * b^3 / c^4 * a^2 * \\
& (c * x^2 + b * x + a)^{(1/2)} + 93/1120 * f^2 * b / c^3 * a * (c * x^2 + b * x + a)^{(5/2)} - 7/30 * \\
& b / c^2 * (c * x^2 + b * x + a)^{(5/2)} * d * f + 7/96 * b^2 / c^2 * (c * x^2 + b * x + a)^{(3/2)} * x * \\
& e^2 - 11/112 * f^2 * b / c^2 * x^2 * (c * x^2 + b * x + a)^{(5/2)} - 1/48 / c^2 * a * (c * x^2 + b * \\
& x + a)^{(3/2)} * b * e^2 - 1/16 / c * a^2 * (c * x^2 + b * x + a)^{(1/2)} * x * e^2 - 1/32 / c^2 * a^2 \\
& * (c * x^2 + b * x + a)^{(1/2)} * b * e^2 - 1/8 / c^{(3/2)} * a^3 * \ln((1/2 * b + c * x) / c^{(1/2)} \\
&) + (c * x^2 + b * x + a)^{(1/2)} * d * f + 1/3 * x * (c * x^2 + b * x + a)^{(5/2)} / c * d * f - 15/256 \\
& * b^4 / c^{(7/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * a * e^2 + 7/ \\
& 512 * b^6 / c^{(9/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * d * f - 1 \\
& / 24 / c * a * (c * x^2 + b * x + a)^{(3/2)} * x * e^2 + 7/96 * b^3 / c^3 * (c * x^2 + b * x + a)^{(3/2)} \\
&) * d * f - 7/256 * b^4 / c^3 * (c * x^2 + b * x + a)^{(1/2)} * x * e^2 + 1/16 * b^3 / c^3 * (c * x^2 \\
& + b * x + a)^{(1/2)} * a * e^2 - 7/256 * b^5 / c^4 * (c * x^2 + b * x + a)^{(1/2)} * d * f + 9/64 * b^4
\end{aligned}$$

$$\begin{aligned} & 2/c^{(5/2)} * \ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)}) * a^2 * e^2 + 3/6 \\ & 4*d*e*b^4/c^3 * (c*x^2+b*x+a)^{(1/2)} - 3/128*d*e*b^5/c^{(7/2)} * \ln((1/2*b \\ & +c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)}) - 1/8*d*e*b^2/c^2 * (c*x^2+b*x+a)^{(3/2)} + 3/20*e*f*b^2/c^3 * (c*x^2+b*x+a)^{(5/2)} - 3/64*e*f*b^4/c^4 * (c*x^2 \\ & +b*x+a)^{(3/2)} + 9/512*e*f*b^6/c^5 * (c*x^2+b*x+a)^{(1/2)} + 3/16*d^2/c * (\\ & c*x^2+b*x+a)^{(1/2)} * b*a + 2/7*e*f*x^2 * (c*x^2+b*x+a)^{(5/2)}/c - 9/1024*e \\ & *f*b^7/c^{(11/2)} * \ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)}) - 4/35* \\ & e*f/c^2 * a * (c*x^2+b*x+a)^{(5/2)} + 1/4*d^2 * (c*x^2+b*x+a)^{(3/2)} * x - 3/32* \\ & d^2/c * (c*x^2+b*x+a)^{(1/2)} * x * b^2 - 3/16*d^2/c^{(3/2)} * \ln((1/2*b+c*x)/ \\ & c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)}) * b^2 * a \end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError

Fricas [A] time = 1.15616, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2 + b*x + a)^(3/2) * (f*x^2 + e*x + d)^2, x, algorithm="fricas")

[Out] [1/6881280*(4*(215040*c^7*f^2*x^7 + 15360*(32*c^7*e*f + 17*b*c^6*f^2)*x^6 + 1280*(224*c^7*e^2 + 3*(b^2*c^5 + 84*a*c^6)*f^2 + 32*(14*c^7*d + 15*b*c^6*e)*f)*x^5 + 128*(5376*c^7*d*e + 2912*b*c^6*e^2 - 3*(11*b^3*c^4 - 52*a*b*c^5)*f^2 + 32*(182*b*c^6*d + 3*(b^2*c^5 + 64*a*c^6)*e)*f)*x^4 + 16*(26880*c^7*d^2 + 59136*b*c^6*d*e + 224*(3*b^2*c^5 + 140*a*c^6)*e^2 + 3*(99*b^4*c^3 - 568*a*b^2*c^4 + 560*a^2*c^5)*f^2 + 32*(14*(3*b^2*c^5 + 140*a*c^6)*d - 3*(9*b^3*c^4 - 44*a*b*c^5)*e)*f)*x^3 - 26880*(3*b^3*c^4 - 20*a*b*c^5)*d^2 + 5376*(15*b^4*c^3 - 100*a*b^2*c^4 + 128*a^2*c^5)*d*e - 224*(105*b^5*c^2 - 760*a*b^3*c^3 + 1296*a^2*b*c^4)*e^2 - 3*(3465*b^7 - 30660*a*b^5*c + 81648*a^2*b^3*c^2 - 58816*a^3*b*c^3)*f^2 + 8*(80640*b*c^6*d^2 + 5376*(b^2*c^5 + 32*a*c^6)*d*e - 224*(7*b^3*c^4 - 36*a*b*c^5)*e^2 - 3*(231*b^5*c^2 - 1560*a*b^3*c^3 + 2416*a^2*b*c^4)*f^2 - 32*(14*(7*b^3*c^4 - 36*a*b*c^5)*d - 3*(21*b^4*c^3 - 124*a*b^2*c^4 + 128*a^2*c^5)*e)*f)*x^2 - 32*(14*(105*b^5*c^2 - 760*a*b^3*c^3 + 1296*a^2*b*c^4)*d - 3*(315*b^6*c - 2520*a*b^4*c^2 + 5488*a^2*b

$$\begin{aligned}
& a^2c^3 - 2048a^3c^4)e)^*f + 2*(26880*(b^2c^5 + 20a^*c^6)*d^2 - \\
& 5376*(5b^3c^4 - 28a^*b^*c^5)*d^*e + 224*(35b^4c^3 - 216a^*b^2* \\
& c^4 + 240a^2c^5)*e^2 + 3*(1155b^6c - 8988a^*b^4c^2 + 18896a \\
& ^2b^2c^3 - 6720a^3c^4)*f^2 + 32*(14*(35b^4c^3 - 216a^*b^2*c \\
& ^4 + 240a^2c^5)*d - 3*(105b^5c^2 - 728a^*b^3c^3 + 1168a^2*b \\
& ^*c^4)*e)*f)*x)*\sqrt{c*x^2 + b*x + a}*\sqrt{c} + 105*(768*(b^4c^4 \\
& - 8a^*b^2c^5 + 16a^2c^6)*d^2 - 768*(b^5c^3 - 8a^*b^3c^4 + 16 \\
& ^*a^2b^*c^5)*d^*e + 32*(7b^6c^2 - 60a^*b^4c^3 + 144a^2*b^2*c^4 \\
& - 64a^3c^5)*e^2 + 3*(33b^8 - 336a^*b^6c + 1120a^2*b^4c^2 - \\
& 1280a^3*b^2c^3 + 256a^4c^4)*f^2 + 32*(2*(7b^6c^2 - 60a^*b^4 \\
& ^*c^3 + 144a^2*b^2c^4 - 64a^3c^5)*d - 3*(3b^7c - 28a^*b^5c^2 \\
& + 80a^2*b^3c^3 - 64a^3b^*c^4)*e)*f)*\log(-4*(2c^2x + b^*c)*s \\
& \sqrt{c*x^2 + b*x + a} - (8c^2x^2 + 8b^*c*x + b^2 + 4a^*c)*\sqrt{c} \\
&))/c^{(13/2)}, 1/3440640*(2*(215040c^7f^2x^7 + 15360*(32c^7e^* \\
& f + 17b^*c^6f^2)*x^6 + 1280*(224c^7e^2 + 3*(b^2c^5 + 84a^*c^6 \\
&)*f^2 + 32*(14c^7d + 15b^*c^6e)*f)*x^5 + 128*(5376c^7d^*e + 2 \\
& 912b^*c^6e^2 - 3*(11b^3c^4 - 52a^*b^*c^5)*f^2 + 32*(182b^*c^6d \\
& + 3*(b^2c^5 + 64a^*c^6)*e)*f)*x^4 + 16*(26880c^7d^2 + 59136b \\
& ^*c^6d^*e + 224*(3b^2c^5 + 140a^*c^6)*e^2 + 3*(99b^4c^3 - 568^* \\
& a^*b^2c^4 + 560a^2c^5)*f^2 + 32*(14*(3b^2c^5 + 140a^*c^6)*d - \\
& 3*(9b^3c^4 - 44a^*b^*c^5)*e)*f)*x^3 - 26880*(3b^3c^4 - 20a^*b \\
& ^*c^5)*d^2 + 5376*(15b^4c^3 - 100a^*b^2c^4 + 128a^2c^5)*d^*e - \\
& 224*(105b^5c^2 - 760a^*b^3c^3 + 1296a^2b^*c^4)*e^2 - 3*(3465 \\
& ^*b^7 - 30660a^*b^5c + 81648a^2b^3c^2 - 58816a^3b^*c^3)*f^2 + \\
& 8*(80640b^*c^6d^2 + 5376*(b^2c^5 + 32a^*c^6)*d^*e - 224*(7b^3^* \\
& c^4 - 36a^*b^*c^5)*e^2 - 3*(231b^5c^2 - 1560a^*b^3c^3 + 2416a^ \\
& ^2b^*c^4)*f^2 - 32*(14*(7b^3c^4 - 36a^*b^*c^5)*d - 3*(21b^4c^3 \\
& - 124a^*b^2c^4 + 128a^2c^5)*e)*f)*x^2 - 32*(14*(105b^5c^2 - \\
& 760a^*b^3c^3 + 1296a^2b^*c^4)*d - 3*(315b^6c - 2520a^*b^4c^2 \\
& + 5488a^2b^2c^3 - 2048a^3c^4)*e)*f + 2*(26880*(b^2c^5 + 20 \\
& ^*a^*c^6)*d^2 - 5376*(5b^3c^4 - 28a^*b^*c^5)*d^*e + 224*(35b^4c^3 \\
& - 216a^*b^2c^4 + 240a^2c^5)*e^2 + 3*(1155b^6c - 8988a^*b^4^* \\
& c^2 + 18896a^2b^2c^3 - 6720a^3c^4)*f^2 + 32*(14*(35b^4c^3 \\
& - 216a^*b^2c^4 + 240a^2c^5)*d - 3*(105b^5c^2 - 728a^*b^3c^3 \\
& + 1168a^2b^*c^4)*e)*f)*x)*\sqrt{c*x^2 + b*x + a}*\sqrt{-c} + 105^* \\
& (768*(b^4c^4 - 8a^*b^2c^5 + 16a^2c^6)*d^2 - 768*(b^5c^3 - 8^* \\
& a^*b^3c^4 + 16a^2b^*c^5)*d^*e + 32*(7b^6c^2 - 60a^*b^4c^3 + 14 \\
& 4a^2b^2c^4 - 64a^3c^5)*e^2 + 3*(33b^8 - 336a^*b^6c + 1120^* \\
& a^2b^4c^2 - 1280a^3b^2c^3 + 256a^4c^4)*f^2 + 32*(2*(7b^6c^2 \\
& - 60a^*b^4c^3 + 144a^2b^2c^4 - 64a^3c^5)*d - 3*(3b^7c \\
& - 28a^*b^5c^2 + 80a^2b^3c^3 - 64a^3b^*c^4)*e)*f)*\arctan(1/2 \\
& *(2c*x + b)*\sqrt{-c}/(\sqrt{c*x^2 + b*x + a}*c))/(\sqrt{-c}*c^6)]
\end{aligned}$$

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

$$\int (a + bx + cx^2)^{\frac{3}{2}} (d + ex + fx^2)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)**(3/2)*(f*x**2+e*x+d)**2,x)

[Out] $\text{Integral}((a + b*x + c*x**2)**(3/2)*(d + e*x + f*x**2)**2, x)$

GIAC/XCAS [A] time = 0.283909, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

[In] $\text{integrate}((c*x^2 + b*x + a)^{(3/2)}*(f*x^2 + e*x + d)^2, x, \text{algorithm}="giac")$

[Out] Done

$$3.105 \quad \int (a + bx + cx^2)^{3/2} (d + ex + fx^2) dx$$

Optimal. Leaf size=236

$$\begin{aligned} & \frac{(b^2 - 4ac)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-4c(af + 3be) + 7b^2f + 24c^2d)}{1024c^{9/2}} \\ & - \frac{(b^2 - 4ac)(b + 2cx)\sqrt{a + bx + cx^2} (-4c(af + 3be) + 7b^2f + 24c^2d)}{512c^4} \\ & + \frac{(b + 2cx)(a + bx + cx^2)^{3/2} (-4acf + 7b^2f - 12bce + 24c^2d)}{192c^3} \\ & + \frac{(a + bx + cx^2)^{5/2} (12ce - 7bf)}{60c^2} + \frac{fx(a + bx + cx^2)^{5/2}}{6c} \end{aligned}$$

[Out] $-\left((b^2 - 4ac) \cdot (24c^2d + 7b^2f - 4c(3be + af)) \cdot (b + 2cx) \cdot \sqrt{a + bx + cx^2}\right) / (512c^4) + \left((24c^2d - 12bce + 7b^2f - 4caf) \cdot (b + 2cx) \cdot (a + bx + cx^2)^{3/2}\right) / (192c^3) + \left((12ce - 7bf) \cdot (a + bx + cx^2)^{5/2}\right) / (60c^2) + (fx \cdot (a + bx + cx^2)^{5/2}) / (6c) + \left((b^2 - 4ac)^2 \cdot (24c^2d + 7b^2f - 4c(3be + af)) \cdot \text{ArcTanh}\left[\frac{b + 2cx}{2\sqrt{c}\sqrt{a + bx + cx^2}}\right]\right) / (1024c^{9/2})$

Rubi [A] time = 0.497392, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\begin{aligned} & \frac{(b^2 - 4ac)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-4c(af + 3be) + 7b^2f + 24c^2d)}{1024c^{9/2}} \\ & - \frac{(b^2 - 4ac)(b + 2cx)\sqrt{a + bx + cx^2} (-4c(af + 3be) + 7b^2f + 24c^2d)}{512c^4} \\ & + \frac{(b + 2cx)(a + bx + cx^2)^{3/2} (-4acf + 7b^2f - 12bce + 24c^2d)}{192c^3} \\ & + \frac{(a + bx + cx^2)^{5/2} (12ce - 7bf)}{60c^2} + \frac{fx(a + bx + cx^2)^{5/2}}{6c} \end{aligned}$$

Antiderivative was successfully verified.

[In] $\text{Int}[(a + bx + cx^2)^{3/2} (d + ex + fx^2), x]$

[Out] $-\left((b^2 - 4ac) \cdot (24c^2d + 7b^2f - 4c(3be + af)) \cdot (b + 2cx) \cdot \sqrt{a + bx + cx^2}\right) / (512c^4) + \left((24c^2d - 12bce + 7b^2f - 4caf) \cdot (b + 2cx) \cdot (a + bx + cx^2)^{3/2}\right) / (192c^3) + \left((12ce - 7bf) \cdot (a + bx + cx^2)^{5/2}\right) / (60c^2) + (fx \cdot (a + bx + cx^2)^{5/2}) / (6c) + \left((b^2 - 4ac)^2 \cdot (24c^2d + 7b^2f - 4c(3be + af)) \cdot \text{ArcTanh}\left[\frac{b + 2cx}{2\sqrt{c}\sqrt{a + bx + cx^2}}\right]\right) / (1024c^{9/2})$

$$- 4*c*(3*b*e + a*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])]/(1024*c^(9/2))$$

Rubi in Sympy [A] time = 30.602, size = 223, normalized size = 0.94

$$\begin{aligned} & - \frac{(a + bx + cx^2)^{\frac{5}{2}} \left(\frac{7bf}{2} - 6ce - 5cfx \right)}{30c^2} \\ & + \frac{(b + 2cx)(a + bx + cx^2)^{\frac{3}{2}} (-4acf + 7b^2f - 12bce + 24c^2d)}{192c^3} \\ & - \frac{(b + 2cx)(-4ac + b^2) \sqrt{a + bx + cx^2} (-4acf + 7b^2f - 12bce + 24c^2d)}{512c^4} \\ & + \frac{(-4ac + b^2)^2 (-4acf + 7b^2f - 12bce + 24c^2d) \operatorname{atanh} \left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}} \right)}{1024c^{\frac{9}{2}}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((c*x**2+b*x+a)**(3/2)*(f*x**2+e*x+d),x)`

[Out] $-(a + b*x + c*x**2)**(5/2)*(7*b*f/2 - 6*c*e - 5*c*f*x)/(30*c**2) + (b + 2*c*x)*(a + b*x + c*x**2)**(3/2)*(-4*a*c*f + 7*b**2*f - 12*b*c*e + 24*c**2*d)/(192*c**3) - (b + 2*c*x)*(-4*a*c + b**2)*\operatorname{sqrt}(a + b*x + c*x**2)*(-4*a*c*f + 7*b**2*f - 12*b*c*e + 24*c**2*d)/(512*c**4) + (-4*a*c + b**2)**2*(-4*a*c*f + 7*b**2*f - 12*b*c*e + 24*c**2*d)*\operatorname{atanh}((b + 2*c*x)/(2*\operatorname{sqrt}(c)*\operatorname{sqrt}(a + b*x + c*x**2)))/(1024*c**(9/2))$

Mathematica [A] time = 0.657957, size = 290, normalized size = 1.23

$$15(b^2 - 4ac)^2 \log\left(2\sqrt{c}\sqrt{a + x(b + cx)} + b + 2cx\right) (-4c(af + 3be) + 7b^2f + 24c^2d) - 2\sqrt{c}\sqrt{a + x(b + cx)}(-16bc^2(-81a^2f$$

Antiderivative was successfully verified.

[In] `Integrate[(a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2),x]`

[Out] $(-2*\operatorname{Sqrt}[c]*\operatorname{Sqrt}[a + x*(b + c*x)]*(105*b^5*f - 10*b^4*c*(18*e + 7*f*x) + 8*b^3*c*(45*c*d - 95*a*f + c*x*(15*e + 7*f*x)) + 48*b^2*c^2*(a*(25*e + 9*f*x) - c*x*(5*d + x*(2*e + f*x))) - 16*b*c^2*(-81*a^2*f + 6*a*c*(25*d + x*(7*e + 3*f*x)) + 4*c^2*x^2*(45*d + x*(33*e + 26*f*x))) - 32*c^3*(3*a^2*(16*e + 5*f*x) + 4*c^2*x^3*(15*d + 2*x*(6*e + 5*f*x)) + 2*a*c*x*(75*d + x*(48*e + 35*f*x)))) + 15*($

$$b^2 - 4*a*c)^2*(24*c^2*d + 7*b^2*f - 4*c*(3*b*e + a*f))*\text{Log}[b + 2*c*x + 2*\text{Sqrt}[c]*\text{Sqrt}[a + x*(b + c*x)]]/(15360*c^{9/2})$$

Maple [B] time = 0.011, size = 862, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]
$$\begin{aligned} & -3/16*e*b/c*(c*x^2+b*x+a)^{1/2}*x*a+1/8*f*b^2/c^2*(c*x^2+b*x+a)^{1/2} \\ & *x^2*a-15/256*f*b^4/c^{7/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *a-1/24*f/c*a*(c*x^2+b*x+a)^{3/2}*x-1/8*e*b/c*(c*x^2+b*x+a)^{3/2} \\ & *x+3/64*e*b^3/c^2*(c*x^2+b*x+a)^{1/2}*x-3/32*e*b^2/c^2*(c*x^2+b*x+a)^{1/2} \\ & *a-3/16*e*b/c^{3/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *a^2+3/32*e*b^3/c^{5/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *a-3/32*d/c*(c*x^2+b*x+a)^{1/2}*x^2+b^2+3/16*d/c*(c*x^2+b*x+a)^{1/2} \\ & *b*a-3/16*d/c^{3/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *b^2*a-1/32*f/c^2*a^2*(c*x^2+b*x+a)^{1/2}*b+7/96*f*b^2/c^2 \\ & *(c*x^2+b*x+a)^{3/2}*x-7/256*f*b^4/c^3*(c*x^2+b*x+a)^{1/2}*x+1/16*f*b^3/c^3 \\ & *(c*x^2+b*x+a)^{1/2}*a+9/64*f*b^2/c^{5/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *a^2-1/16*f/c*a^2*(c*x^2+b*x+a)^{1/2}*x+1/5*e*(c*x^2+b*x+a)^{5/2}/c+1/4*d \\ & *(c*x^2+b*x+a)^{3/2}*x+1/6*f*x*(c*x^2+b*x+a)^{5/2}/c+3/8*d*(c*x^2+b*x+a)^{1/2} \\ & *x^2*a-3/64*d/c^2*(c*x^2+b*x+a)^{1/2}*b^3+3/8*d/c^{1/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *a^2+3/128*d/c^{5/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & *b^4+7/192*f*b^3/c^3*(c*x^2+b*x+a)^{3/2}-7/512*f*b^5/c^4*(c*x^2+b*x+a)^{1/2} \\ & +7/1024*f*b^6/c^{9/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & -1/16*e*b^2/c^2*(c*x^2+b*x+a)^{3/2}+3/128*e*b^4/c^3*(c*x^2+b*x+a)^{1/2} \\ & -3/256*e*b^5/c^{7/2}*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & +1/8*d/c*(c*x^2+b*x+a)^{3/2}*b-1/16*f/c^{3/2}*a^3*\ln((1/2*b+c*x)/c^{1/2}+(c*x^2+b*x+a)^{1/2}) \\ & -7/60*f*b/c^2*(c*x^2+b*x+a)^{5/2}-1/48*f/c^2*a*(c*x^2+b*x+a)^{3/2}*b \end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 0.373982, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d),x, algorithm="fricas")

[Out] [1/30720*(4*(1280*c^5*f*x^5 + 128*(12*c^5*e + 13*b*c^4*f)*x^4 + 16*(120*c^5*d + 132*b*c^4*e + (3*b^2*c^3 + 140*a*c^4)*f)*x^3 + 8*(360*b*c^4*d + 12*(b^2*c^3 + 32*a*c^4)*e - (7*b^3*c^2 - 36*a*b*c^3)*f)*x^2 - 120*(3*b^3*c^2 - 20*a*b*c^3)*d + 12*(15*b^4*c - 100*a*b^2*c^2 + 128*a^2*c^3)*e - (105*b^5 - 760*a*b^3*c + 1296*a^2*b*c^2)*f + 2*(120*(b^2*c^3 + 20*a*c^4)*d - 12*(5*b^3*c^2 - 28*a*b*c^3)*e + (35*b^4*c - 216*a*b^2*c^2 + 240*a^2*c^3)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) - 15*(24*(b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4)*d - 12*(b^5*c - 8*a*b^3*c^2 + 16*a^2*b*c^3)*e + (7*b^6 - 60*a*b^4*c + 144*a^2*b^2*c^2 - 64*a^3*c^3)*f)*log(4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c^(9/2), 1/15360*(2*(1280*c^5*f*x^5 + 128*(12*c^5*e + 13*b*c^4*f)*x^4 + 16*(120*c^5*d + 132*b*c^4*e + (3*b^2*c^3 + 140*a*c^4)*f)*x^3 + 8*(360*b*c^4*d + 12*(b^2*c^3 + 32*a*c^4)*e - (7*b^3*c^2 - 36*a*b*c^3)*f)*x^2 - 120*(3*b^3*c^2 - 20*a*b*c^3)*d + 12*(15*b^4*c - 100*a*b^2*c^2 + 128*a^2*c^3)*e - (105*b^5 - 760*a*b^3*c + 1296*a^2*b*c^2)*f + 2*(120*(b^2*c^3 + 20*a*c^4)*d - 12*(5*b^3*c^2 - 28*a*b*c^3)*e + (35*b^4*c - 216*a*b^2*c^2 + 240*a^2*c^3)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) + 15*(24*(b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4)*d - 12*(b^5*c - 8*a*b^3*c^2 + 16*a^2*b*c^3)*e + (7*b^6 - 60*a*b^4*c + 144*a^2*b^2*c^2 - 64*a^3*c^3)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c))/(sqrt(-c)*c^4)]

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

$$\int (a + bx + cx^2)^{\frac{3}{2}} (d + ex + fx^2) dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((c*x**2+b*x+a)**(3/2)*(f*x**2+e*x+d),x)

[Out] Integral((a + b*x + c*x**2)**(3/2)*(d + e*x + f*x**2), x)

GIAC/XCAS [A] time = 0.27966, size = 563, normalized size = 2.39

$$\frac{1}{7680} \sqrt{cx^2 + bx + a} \left(2 \left(4 \left(2 \left(8 \left(10 c f x + \frac{13 b c^5 f + 12 c^6 e}{c^5} \right) x + \frac{120 c^6 d + 3 b^2 c^4 f + 140 a c^5 f + 132 b c^5 e}{c^5} \right) x + \frac{360 b c^5 d - 7}{1024 c^{\frac{9}{2}}} \right) \right) \ln \left(\frac{(24 b^4 c^2 d - 192 a b^2 c^3 d + 384 a^2 c^4 d + 7 b^6 f - 60 a b^4 c f + 144 a^2 b^2 c^2 f - 64 a^3 c^3 f - 12 b^5 c e + 96 a b^3 c^2 e - 192 a^2 b c^3 e)}{1024 c^{\frac{9}{2}}} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 1/7680*sqrt(c*x^2 + b*x + a)*(2*(4*(2*(8*(10*c*f*x + (13*b*c^5*f + 12*c^6*e)/c^5)*x + (120*c^6*d + 3*b^2*c^4*f + 140*a*c^5*f + 132*b*c^5*e)/c^5)*x + (360*b*c^5*d - 7*b^3*c^3*f + 36*a*b*c^4*f + 12*b^2*c^4*e + 384*a*c^5*e)/c^5)*x + (120*b^2*c^4*d + 2400*a*c^5*d + 35*b^4*c^2*f - 216*a*b^2*c^3*f + 240*a^2*c^4*f - 60*b^3*c^3*e + 336*a*b*c^4*e)/c^5)*x - (360*b^3*c^3*d - 2400*a*b*c^4*d + 105*b^5*c*f - 760*a*b^3*c^2*f + 1296*a^2*b*c^3*f - 180*b^4*c^2*e + 1200*a*b^2*c^3*e - 1536*a^2*c^4*e)/c^5) - 1/1024*(24*b^4*c^2*d - 192*a*b^2*c^3*d + 384*a^2*c^4*d + 7*b^6*f - 60*a*b^4*c*f + 144*a^2*b^2*c^2*f - 64*a^3*c^3*f - 12*b^5*c*e + 96*a*b^3*c^2*e - 192*a^2*b*c^3*e)*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b)/c^(9/2))

$$3.106 \quad \int \frac{(a+bx+cx^2)^{3/2}}{d+ex+fx^2} dx$$

Optimal. Leaf size=679

$$\frac{\left(\left(e - \sqrt{e^2 - 4df} \right) (ce - bf) (f(be - 2af) - c(e^2 - 2df)) - 2f(-f^2(b^2d - a^2f) + 2cdf(be - af) + c^2(-d)(e^2 - df)) \right) \sqrt{2} f^3 \sqrt{e^2 - 4df} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}{\left(\left(\sqrt{e^2 - 4df} + e \right) (ce - bf) (f(be - 2af) - c(e^2 - 2df)) - 2f(-f^2(b^2d - a^2f) + 2cdf(be - af) + c^2(-d)(e^2 - df)) \right) \sqrt{2} f^3 \sqrt{e^2 - 4df} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}} + \frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-12cf(be - af) + 3b^2f^2 + 8c^2(e^2 - df))}{8\sqrt{c}f^3} - \frac{\sqrt{a+bx+cx^2}(-5bf + 4ce - 2cfx)}{4f^2}$$

[Out] $-\left((4*c*e - 5*b*f - 2*c*f*x)*\text{Sqrt}[a + b*x + c*x^2]\right)/(4*f^2) + \left((3*b^2*f^2 - 12*c*f*(b*e - a*f) + 8*c^2*(e^2 - d*f))*\text{ArcTanh}\left[\frac{b + 2*c*x}{2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2]}\right]\right)/(8*\text{Sqrt}[c]*f^3) + \left(\left((c*e - b*f)*(e - \text{Sqrt}[e^2 - 4*d*f])\right)*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f) - 2*f*(2*c*d*f*(b*e - a*f) - f^2*(b^2*d - a^2*f) - c^2*d*(e^2 - d*f))\right)*\text{ArcTanh}\left[\frac{4*a*f - b*(e - \text{Sqrt}[e^2 - 4*d*f]) + 2*(b*f - c*(e - \text{Sqrt}[e^2 - 4*d*f]))*x}{2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]*\text{Sqrt}[a + b*x + c*x^2]}\right]\right)/\left(\text{Sqrt}[2]*f^3*\text{Sqrt}[e^2 - 4*d*f]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]\right) - \left(\left((c*e - b*f)*(e + \text{Sqrt}[e^2 - 4*d*f])\right)*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f) - 2*f*(2*c*d*f*(b*e - a*f) - f^2*(b^2*d - a^2*f) - c^2*d*(e^2 - d*f))\right)*\text{ArcTanh}\left[\frac{4*a*f - b*(e + \text{Sqrt}[e^2 - 4*d*f]) + 2*(b*f - c*(e + \text{Sqrt}[e^2 - 4*d*f]))*x}{2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]*\text{Sqrt}[a + b*x + c*x^2]}\right]\right)/\left(\text{Sqrt}[2]*f^3*\text{Sqrt}[e^2 - 4*d*f]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]\right)$

Rubi [A] time = 18.25, antiderivative size = 678, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{\left((e - \sqrt{e^2 - 4df}) (ce - bf) (f(be - 2af) - c(e^2 - 2df)) - 2f(-f^2(b^2d - a^2f) + 2cdf(be - af) + c^2(-d)(e^2 - df)) \right) \tan^{-1} \left(\frac{\sqrt{2}f^3\sqrt{e^2 - 4df}\sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}{\left(-2f^3(b^2d - a^2f) - (\sqrt{e^2 - 4df} + e)(ce - bf)(f(be - 2af) - c(e^2 - 2df)) + 4cdf^2(be - af) - 2c^2df(e^2 - df) \right)} \right)}{\frac{\sqrt{2}f^3\sqrt{e^2 - 4df}\sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}{\tanh^{-1} \left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}} \right) (-12cf(be - af) + 3b^2f^2 + 8c^2(e^2 - df))} - \frac{\sqrt{a+bx+cx^2}(-5bf + 4ce - 2cfx)}{4f^2}}$$

Warning: Unable to verify antiderivative.

[In] Int[(a + b*x + c*x^2)^(3/2)/(d + e*x + f*x^2), x]

[Out] -((4*c*e - 5*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(4*f^2) + ((3*b^2*f^2 - 12*c*f*(b*e - a*f) + 8*c^2*(e^2 - d*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*Sqrt[c]*f^3) + (((c*e - b*f)*(e - Sqrt[e^2 - 4*d*f])*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f)) - 2*f*(2*c*d*f*(b*e - a*f) - f^2*(b^2*d - a^2*f) - c^2*d*(e^2 - d*f)))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2])]/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + ((4*c*d*f^2*(b*e - a*f) - 2*f^3*(b^2*d - a^2*f) - 2*c^2*d*f*(e^2 - d*f) - (c*e - b*f)*(e + Sqrt[e^2 - 4*d*f])*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f)))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2])]/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d), x)

[Out] Timed out

Mathematica [B] time = 6.26447, size = 1934, normalized size = 2.85

$$\frac{\left(-c^2e^4 + 2bcfe^3 + c^2\sqrt{e^2 - 4df}e^3 - b^2f^2e^2 - 2acf^2e^2 + 4c^2dfe^2 - 2bcf\sqrt{e^2 - 4df}e^2 + 2abf^3e - 6bcd f^2e + b^2f^2\sqrt{e^2 - 4df}\right)}{\sqrt{2}f^3\sqrt{e^2 - 4df}\sqrt{c}}$$

$$\frac{\left(c^2e^4 - 2bcfe^3 + c^2\sqrt{e^2 - 4df}e^3 + b^2f^2e^2 + 2acf^2e^2 - 4c^2dfe^2 - 2bcf\sqrt{e^2 - 4df}e^2 - 2abf^3e + 6bcd f^2e + b^2f^2\sqrt{e^2 - 4df}\right)}{\sqrt{2}f^3\sqrt{e^2 - 4df}\sqrt{ce}}$$

$$+ \frac{(8e^2c^2 - 8dfc^2 + 12af^2c - 12befc + 3b^2f^2) \log\left(b + 2cx + 2\sqrt{c}\sqrt{cx^2 + bx + a}\right) (a + x(b + cx))^{3/2}}{8\sqrt{c}f^3(cx^2 + bx + a)^{3/2}}$$

$$+ \frac{\left(c^2e^4 - 2bcfe^3 + c^2\sqrt{e^2 - 4df}e^3 + b^2f^2e^2 + 2acf^2e^2 - 4c^2dfe^2 - 2bcf\sqrt{e^2 - 4df}e^2 - 2abf^3e + 6bcd f^2e + b^2f^2\sqrt{e^2 - 4df}\right)}{\sqrt{2}f^3\sqrt{e^2 - 4df}\sqrt{ce}}$$

$$+ \frac{\left(-c^2e^4 + 2bcfe^3 + c^2\sqrt{e^2 - 4df}e^3 - b^2f^2e^2 - 2acf^2e^2 + 4c^2dfe^2 - 2bcf\sqrt{e^2 - 4df}e^2 + 2abf^3e - 6bcd f^2e + b^2f^2\sqrt{e^2 - 4df}\right)}{\sqrt{2}f^3\sqrt{e^2 - 4df}\sqrt{ce}}$$

$$+ \frac{\left(\frac{5bf - 4ce}{4f^2} + \frac{cx}{2f}\right) (a + x(b + cx))^{3/2}}{cx^2 + bx + a}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x + c*x^2)^(3/2)/(d + e*x + f*x^2), x]

[Out] (((-4*c*e + 5*b*f)/(4*f^2) + (c*x)/(2*f))*(a + x*(b + c*x))^(3/2))/(a + b*x + c*x^2) - (((c^2*e^4) + 4*c^2*d*e^2*f + 2*b*c*e^3*f - 2*c^2*d^2*f^2 - 6*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f^2 + 2*b^2*d*f^3 + 4*a*c*d*f^3 + 2*a*b*e*f^3 - 2*a^2*f^4 + c^2*e^3*Sqrt[e^2 - 4*d*f] - 2*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 2*b*c*d*f^2*Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x])/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f])*(a + b*x + c*x^2)^(3/2)) - (((c^2*e^4 - 4*c^2*d*e^2*f - 2*b*c*e^3*f + 2*c^2*d^2*f^2 + 6*b*c*d*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 - 2*b^2*d*f^3 - 4*a*c*d*f^3 - 2*a*b*e*f^3 + 2*a^2*f^4 + c^2*e^3*Sqrt[e^2 - 4*d*f] - 2*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 2*b*c*d*f^2*Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x])/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f])*(a + b*x + c*x^2)^(3/2)) + (((8*c^2*e^2 - 8*c^2*d*f - 12*b*c*e*f + 3*b^2*f^2 +

$$\begin{aligned}
& 12*a*c*f^2*(a + x*(b + c*x))^{3/2}*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + b*x + c*x^2]]/(8*Sqrt[c]*f^3*(a + b*x + c*x^2)^{3/2}) + ((c^2*e^4 - 4*c^2*d*e^2*f - 2*b*c*e^3*f + 2*c^2*d^2*f^2 + 6*b*c*d*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 - 2*b^2*d*f^3 - 4*a*c*d*f^3 - 2*a*b*e*f^3 + 2*a^2*f^4 + c^2*e^3*Sqrt[e^2 - 4*d*f] - 2*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 2*b*c*d*f^2*Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^{3/2}*Log[-(b*e^2) + 4*b*d*f - b*e*Sqrt[e^2 - 4*d*f] + 4*a*f*Sqrt[e^2 - 4*d*f] - 2*c*e^2*x + 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + 2*b*f*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2]]/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f])*(a + b*x + c*x^2)^{3/2}) + ((-(c^2*e^4) + 4*c^2*d*e^2*f + 2*b*c*e^3*f - 2*c^2*d^2*f^2 - 6*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f^2 + 2*b^2*d*f^3 + 4*a*c*d*f^3 + 2*a*b*e*f^3 - 2*a^2*f^4 + c^2*e^3*Sqrt[e^2 - 4*d*f] - 2*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 2*b*c*d*f^2*Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^{3/2})*Log[b*e^2 - 4*b*d*f - b*e*Sqrt[e^2 - 4*d*f] + 4*a*f*Sqrt[e^2 - 4*d*f] + 2*c*e^2*x - 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + 2*b*f*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2]]/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f])*(a + b*x + c*x^2)^{3/2})
\end{aligned}$$

Maple [B] time = 0.045, size = 22523, normalized size = 33.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] result too large to display

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d),x, algorithm="maxima")`

[Out] Exception raised: ValueError

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d), 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((c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d), x)`

[Out] Timed out

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: TypeError

$$3.107 \quad \int \frac{(a+bx+cx^2)^{3/2}}{(d+ex+fx^2)^2} dx$$

Optimal. Leaf size=704

$$\frac{\left((e - \sqrt{e^2 - 4df}) (ce - bf) (f(be - 2af) + 2c(e^2 - 5df)) - 2f (f(-be(3af + cd) + 4af(af + cd) + 2b^2df) + 2c^2d(e^2 - 5df)) \right)}{2\sqrt{2}f^2(e^2 - 4df)^{3/2} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2c^2d}}$$

$$+ \frac{\left((\sqrt{e^2 - 4df} + e) (ce - bf) (f(be - 2af) + 2c(e^2 - 5df)) - 2f (f(-be(3af + cd) + 4af(af + cd) + 2b^2df) + 2c^2d(e^2 - 5df)) \right)}{2\sqrt{2}f^2(e^2 - 4df)^{3/2} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2c^2d}}$$

$$+ \frac{c^{3/2} \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f^2} - \frac{\sqrt{a+bx+cx^2}(-2bf+ce-2cfx)}{f(e^2-4df)} - \frac{(e+2fx)(a+bx+cx^2)^{3/2}}{(e^2-4df)(d+ex+fx^2)}$$

[Out] -(((c*e - 2*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(f*(e^2 - 4*d*f))) - ((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/((e^2 - 4*d*f)*(d + e*x + f*x^2)) + (c^(3/2)*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/f^2 - (((c*e - b*f)*(f*(b*e - 2*a*f) + 2*c*(e^2 - 5*d*f))*(e - Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + (((c*e - b*f)*(f*(b*e - 2*a*f) + 2*c*(e^2 - 5*d*f))*(e + Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])

Rubi [A] time = 22.4085, antiderivative size = 704, normalized size of antiderivative = 1., number of

steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$

$$\frac{\left(\left(e - \sqrt{e^2 - 4df} \right) (ce - bf) (f(be - 2af) + 2c(e^2 - 5df)) - 2f(f(-be(3af + cd) + 4af(af + cd) + 2b^2df) + 2c^2d(e^2 - 4df)) \right)}{2\sqrt{2}f^2(e^2 - 4df)^{3/2} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2c^2d}}$$

$$+ \frac{\left(\left(\sqrt{e^2 - 4df} + e \right) (ce - bf) (f(be - 2af) + 2c(e^2 - 5df)) - 2f(f(-be(3af + cd) + 4af(af + cd) + 2b^2df) + 2c^2d(e^2 - 4df)) \right)}{2\sqrt{2}f^2(e^2 - 4df)^{3/2} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2c^2d}}$$

$$+ \frac{c^{3/2} \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f^2} - \frac{\sqrt{a+bx+cx^2}(-2bf+ce-2cfx)}{f(e^2-4df)} - \frac{(e+2fx)(a+bx+cx^2)^{3/2}}{(e^2-4df)(d+ex+fx^2)}$$

Warning: Unable to verify antiderivative.

[In] Int[(a + b*x + c*x^2)^(3/2)/(d + e*x + f*x^2)^2, x]

[Out] -(((c*e - 2*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(f*(e^2 - 4*d*f))) - ((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/((e^2 - 4*d*f)*(d + e*x + f*x^2)) + (c^(3/2)*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/f^2 - (((c*e - b*f)*(f*(b*e - 2*a*f) + 2*c*(e^2 - 5*d*f))*(e - Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + (((c*e - b*f)*(f*(b*e - 2*a*f) + 2*c*(e^2 - 5*d*f))*(e + Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])

Rubi in Sympy [F-1] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d)**2, x)

[Out] Timed out

Mathematica [B] time = 6.46468, size = 1844, normalized size = 2.62

$$\frac{\left(-2c^2e^4 + bcf e^3 + 2c^2\sqrt{e^2 - 4df}e^3 + b^2f^2e^2 + 2acf^2e^2 + 14c^2dfe^2 - bcf\sqrt{e^2 - 4df}e^2 - 8abf^3e - 12bcd f^2e - b^2f^2\sqrt{e^2 - 4df}\right)^3}{2\sqrt{2}f^2(e^2 - 4df)^3}$$

$$\frac{\left(2c^2e^4 - bcf e^3 + 2c^2\sqrt{e^2 - 4df}e^3 - b^2f^2e^2 - 2acf^2e^2 - 14c^2dfe^2 - bcf\sqrt{e^2 - 4df}e^2 + 8abf^3e + 12bcd f^2e - b^2f^2\sqrt{e^2 - 4df}\right)^3}{2\sqrt{2}f^2(e^2 - 4df)^3}$$

$$+ \frac{c^{3/2} \log\left(b + 2cx + 2\sqrt{c}\sqrt{cx^2 + bx + a}\right) (a + x(b + cx))^{3/2}}{f^2 (cx^2 + bx + a)^{3/2}}$$

$$+ \frac{\left(2c^2e^4 - bcf e^3 + 2c^2\sqrt{e^2 - 4df}e^3 - b^2f^2e^2 - 2acf^2e^2 - 14c^2dfe^2 - bcf\sqrt{e^2 - 4df}e^2 + 8abf^3e + 12bcd f^2e - b^2f^2\sqrt{e^2 - 4df}\right)^3}{2\sqrt{2}f^2(e^2 - 4df)^3}$$

$$+ \frac{\left(-2c^2e^4 + bcf e^3 + 2c^2\sqrt{e^2 - 4df}e^3 + b^2f^2e^2 + 2acf^2e^2 + 14c^2dfe^2 - bcf\sqrt{e^2 - 4df}e^2 - 8abf^3e - 12bcd f^2e - b^2f^2\sqrt{e^2 - 4df}\right)^3}{2\sqrt{2}f^2(e^2 - 4df)^3}$$

$$+ \frac{(cxe^2 + cde + afe - bfxe - 2bdf + 2af^2x - 2cdfx) (a + x(b + cx))^{3/2}}{f(4df - e^2)(cx^2 + bx + a)(fx^2 + ex + d)}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x + c*x^2)^(3/2)/(d + e*x + f*x^2)^2, x]

$$\begin{aligned} & \left((c*d*e - 2*b*d*f + a*e*f + c*e^2*x - 2*c*d*f*x - b*e*f*x + 2*a*f \right. \\ & \left. ^2*x) * (a + x*(b + c*x))^{3/2} \right) / (f*(-e^2 + 4*d*f) * (a + b*x + c*x^2 \\ &) * (d + e*x + f*x^2)) - \left((-2*c^2*e^4 + 14*c^2*d*e^2*f + b*c*e^3*f \right. \\ & - 16*c^2*d^2*f^2 - 12*b*c*d*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 + \\ & 4*b^2*d*f^3 + 8*a*c*d*f^3 - 8*a*b*e*f^3 + 8*a^2*f^4 + 2*c^2*e^3* \\ & \text{Sqrt}[e^2 - 4*d*f] - 10*c^2*d*e*f*\text{Sqrt}[e^2 - 4*d*f] - b*c*e^2*f*\text{Sqr} \\ & \text{rt}[e^2 - 4*d*f] + 10*b*c*d*f^2*\text{Sqrt}[e^2 - 4*d*f] - b^2*e*f^2*\text{Sqr} \\ & \text{rt}[e^2 - 4*d*f] - 2*a*c*e*f^2*\text{Sqrt}[e^2 - 4*d*f] + 2*a*b*f^3*\text{Sqr} \\ & \text{rt}[e^2 - 4*d*f]) * (a + x*(b + c*x))^{3/2} * \text{Log}[-e + \text{Sqrt}[e^2 - 4*d*f] - \\ & 2*f*x]) / (2*\text{Sqrt}[2]*f^2*(e^2 - 4*d*f)^{3/2} * \text{Sqrt}[c*e^2 - 2*c*d*f - \\ & b*e*f + 2*a*f^2 - c*e*\text{Sqrt}[e^2 - 4*d*f] + b*f*\text{Sqrt}[e^2 - 4*d*f]]) \\ & * (a + b*x + c*x^2)^{3/2} - \left((2*c^2*e^4 - 14*c^2*d*e^2*f - b*c*e^3 \right. \\ & \left. ^3*f + 16*c^2*d^2*f^2 + 12*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f \right. \\ & \left. ^2 - 4*b^2*d*f^3 - 8*a*c*d*f^3 + 8*a*b*e*f^3 - 8*a^2*f^4 + 2*c^2* \right. \\ & \left. e^3*\text{Sqrt}[e^2 - 4*d*f] - 10*c^2*d*e*f*\text{Sqrt}[e^2 - 4*d*f] - b*c*e^2* \right. \\ & \left. f*\text{Sqrt}[e^2 - 4*d*f] + 10*b*c*d*f^2*\text{Sqrt}[e^2 - 4*d*f] - b^2*e*f^2* \right. \\ & \left. \text{Sqrt}[e^2 - 4*d*f] - 2*a*c*e*f^2*\text{Sqrt}[e^2 - 4*d*f] + 2*a*b*f^3*\text{Sqr} \right. \\ & \left. \text{rt}[e^2 - 4*d*f]) * (a + x*(b + c*x))^{3/2} * \text{Log}[e + \text{Sqrt}[e^2 - 4*d*f]] \right) \end{aligned}$$

$$\begin{aligned}
& + 2*f*x))/ (2*\text{Sqrt}[2]*f^2*(e^2 - 4*d*f)^{(3/2)}*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*\text{Sqrt}[e^2 - 4*d*f] - b*f*\text{Sqrt}[e^2 - 4*d*f]])*(a + b*x + c*x^2)^{(3/2)} + (c^{(3/2)}*(a + x*(b + c*x))^{(3/2)}*\text{Log}[b + 2*c*x + 2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2]])/(f^2*(a + b*x + c*x^2)^{(3/2)} + ((2*c^2*e^4 - 14*c^2*d*e^2*f - b*c*e^3*f + 16*c^2*d^2*f^2 + 12*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f^2 - 4*b^2*d*f^3 - 8*a*c*d*f^3 + 8*a*b*e*f^3 - 8*a^2*f^4 + 2*c^2*e^3*\text{Sqrt}[e^2 - 4*d*f] - 10*c^2*d*e*f*\text{Sqrt}[e^2 - 4*d*f] - b*c*e^2*f*\text{Sqrt}[e^2 - 4*d*f] + 10*b*c*d*f^2*\text{Sqrt}[e^2 - 4*d*f] - b^2*e*f^2*\text{Sqrt}[e^2 - 4*d*f] - 2*a*c*e*f^2*\text{Sqrt}[e^2 - 4*d*f] + 2*a*b*f^3*\text{Sqrt}[e^2 - 4*d*f]))*(a + x*(b + c*x))^{(3/2)}*\text{Log}[b*e - 4*a*f + b*\text{Sqrt}[e^2 - 4*d*f] + 2*c*e*x - 2*b*f*x + 2*c*\text{Sqrt}[e^2 - 4*d*f]*x - 2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*\text{Sqrt}[e^2 - 4*d*f] - b*f*\text{Sqrt}[e^2 - 4*d*f]]*\text{Sqrt}[a + b*x + c*x^2]])/(2*\text{Sqrt}[2]*f^2*(e^2 - 4*d*f)^{(3/2)}*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*\text{Sqrt}[e^2 - 4*d*f] - b*f*\text{Sqrt}[e^2 - 4*d*f]])*(a + b*x + c*x^2)^{(3/2)} + ((-2*c^2*e^4 + 14*c^2*d*e^2*f + b*c*e^3*f - 16*c^2*d^2*f^2 - 12*b*c*d*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 + 4*b^2*d*f^3 + 8*a*c*d*f^3 - 8*a*b*e*f^3 + 8*a^2*f^4 + 2*c^2*e^3*\text{Sqrt}[e^2 - 4*d*f] - 10*c^2*d*e*f*\text{Sqrt}[e^2 - 4*d*f] - b*c*e^2*f*\text{Sqrt}[e^2 - 4*d*f] + 10*b*c*d*f^2*\text{Sqrt}[e^2 - 4*d*f] - b^2*e*f^2*\text{Sqrt}[e^2 - 4*d*f] - 2*a*c*e*f^2*\text{Sqrt}[e^2 - 4*d*f] + 2*a*b*f^3*\text{Sqrt}[e^2 - 4*d*f]))*(a + x*(b + c*x))^{(3/2)}*\text{Log}[-(b*e) + 4*a*f + b*\text{Sqrt}[e^2 - 4*d*f] - 2*c*e*x + 2*b*f*x + 2*c*\text{Sqrt}[e^2 - 4*d*f]*x + 2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*\text{Sqrt}[e^2 - 4*d*f] + b*f*\text{Sqrt}[e^2 - 4*d*f]]*\text{Sqrt}[a + b*x + c*x^2]])/(2*\text{Sqrt}[2]*f^2*(e^2 - 4*d*f)^{(3/2)}*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*\text{Sqrt}[e^2 - 4*d*f] + b*f*\text{Sqrt}[e^2 - 4*d*f]])*(a + b*x + c*x^2)^{(3/2)}
\end{aligned}$$

Maple [B] time = 0.069, size = 72576, normalized size = 103.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] result too large to display

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

$$\int \frac{(cx^2 + bx + a)^{\frac{3}{2}}}{(fx^2 + ex + d)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d)^2,x, algorithm="maxima")
```

```
[Out] integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d)^2, x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d)^2,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((c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: TypeError
```

$$3.108 \quad \int \frac{(a+bx+cx^2)^{3/2}}{(d+ex+fx^2)^3} dx$$

Optimal. Leaf size=671

$$\frac{3 \left(2 \left(e - \sqrt{e^2 - 4df} \right) (ce - bf)(2af - be + 2cd) - f (4be(3af + cd) - 4a(4af^2 + ce^2) + b^2(- (4df + e^2))) \right) \tanh^{-1} \left(\frac{\dots}{2\sqrt{\dots}} \right)}{4\sqrt{2}(e^2 - 4df)^{5/2} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}$$

$$+ \frac{3 \left(2 \left(\sqrt{e^2 - 4df} + e \right) (ce - bf)(2af - be + 2cd) - f (4be(3af + cd) - 4a(4af^2 + ce^2) + b^2(- (4df + e^2))) \right) \tanh^{-1} \left(\frac{\dots}{2\sqrt{\dots}} \right)}{4\sqrt{2}(e^2 - 4df)^{5/2} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}$$

$$+ \frac{3\sqrt{a+bx+cx^2} (2x(4af^2 - 2bef + ce^2) + 4aef - b(4df + e^2) + 4cde)}{4(e^2 - 4df)^2 (d + ex + fx^2)} - \frac{(e + 2fx)(a + bx + cx^2)^{3/2}}{2(e^2 - 4df)(d + ex + fx^2)^2}$$

```
[Out] -((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/(2*(e^2 - 4*d*f)*(d + e*x
+ f*x^2)^2) + (3*(4*c*d*e + 4*a*e*f - b*(e^2 + 4*d*f) + 2*(c*e^2
- 2*b*e*f + 4*a*f^2)*x)*Sqrt[a + b*x + c*x^2])/(4*(e^2 - 4*d*f)^2
*(d + e*x + f*x^2)) - (3*(2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e
- Sqrt[e^2 - 4*d*f]) - f*(4*b*e*(c*d + 3*a*f) - b^2*(e^2 + 4*d*f)
- 4*a*(c*e^2 + 4*a*f^2)))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d
*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e
^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*S
qrt[a + b*x + c*x^2])]/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2
- 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) +
(3*(2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + Sqrt[e^2 - 4*d*f]) -
f*(4*b*e*(c*d + 3*a*f) - b^2*(e^2 + 4*d*f) - 4*a*(c*e^2 + 4*a*f^
2)))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e +
Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f +
2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])*Sqrt[a + b*x + c*x^2])]/
(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2
*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

Rubi [A] time = 17.6291, antiderivative size = 669, normalized size of antiderivative = 1., number of

steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{3 \left(-2 \left(e - \sqrt{e^2 - 4df} \right) (ce - bf)(2af - be + 2cd) + 4bef(3af + cd) - 4af(4af^2 + ce^2) + b^2(-f)(4df + e^2) \right) \tanh^{-1} \left(\frac{-}{2\sqrt{2}} \right)}{4\sqrt{2}(e^2 - 4df)^{5/2} \sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}$$

$$- \frac{3 \left(-2 \left(\sqrt{e^2 - 4df} + e \right) (ce - bf)(2af - be + 2cd) + 4bef(3af + cd) - 4af(4af^2 + ce^2) + b^2(-f)(4df + e^2) \right) \tanh^{-1} \left(\frac{-}{2} \right)}{4\sqrt{2}(e^2 - 4df)^{5/2} \sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}$$

$$+ \frac{3\sqrt{a + bx + cx^2} (2x(4af^2 - 2bef + ce^2) + 4aef - b(4df + e^2) + 4cde)}{4(e^2 - 4df)^2 (d + ex + fx^2)} - \frac{(e + 2fx)(a + bx + cx^2)^{3/2}}{2(e^2 - 4df)(d + ex + fx^2)^2}$$

Warning: Unable to verify antiderivative.

[In] Int[(a + b*x + c*x^2)^(3/2)/(d + e*x + f*x^2)^3, x]

[Out] $-\left((e + 2*f*x)^*(a + b*x + c*x^2)^{(3/2)} / (2*(e^2 - 4*d*f)^*(d + e*x + f*x^2)^2) + (3*(4*c*d*e + 4*a*e*f - b*(e^2 + 4*d*f) + 2*(c*e^2 - 2*b*e*f + 4*a*f^2)*x) * \text{Sqrt}[a + b*x + c*x^2] / (4*(e^2 - 4*d*f)^2 * (d + e*x + f*x^2)) + (3*(4*b*e*f*(c*d + 3*a*f) - b^2*f*(e^2 + 4*d*f) - 4*a*f*(c*e^2 + 4*a*f^2) - 2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e - \text{Sqrt}[e^2 - 4*d*f])) * \text{ArcTanh}[(4*a*f - b*(e - \text{Sqrt}[e^2 - 4*d*f]) + 2*(b*f - c*(e - \text{Sqrt}[e^2 - 4*d*f]))*x) / (2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]) * \text{Sqrt}[a + b*x + c*x^2]) / (4*\text{Sqrt}[2]*(e^2 - 4*d*f)^{(5/2)}*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]) - (3*(4*b*e*f*(c*d + 3*a*f) - b^2*f*(e^2 + 4*d*f) - 4*a*f*(c*e^2 + 4*a*f^2) - 2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + \text{Sqrt}[e^2 - 4*d*f])) * \text{ArcTanh}[(4*a*f - b*(e + \text{Sqrt}[e^2 - 4*d*f]) + 2*(b*f - c*(e + \text{Sqrt}[e^2 - 4*d*f]))*x) / (2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]) * \text{Sqrt}[a + b*x + c*x^2]) / (4*\text{Sqrt}[2]*(e^2 - 4*d*f)^{(5/2)}*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]])$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d)**3, x)

[Out] Timed out

Mathematica [B] time = 6.66612, size = 1621, normalized size = 2.42

$$\frac{\left(\frac{cx^2+cde+afe-bfxe-2bdf+2af^2x-2cdfx}{2f(4df-e^2)(fx^2+ex+d)^2} + \frac{2ce^3-7bfe^2+2cfxe^2+12af^2e+4cdf e-12bf^2xe+4bdf^2+24af^3x+16cdf^2x}{4f(4df-e^2)^2(fx^2+ex+d)}\right)(a+x(b+cx))^{3/2}}{cx^2+bx+a}$$

$$+ \frac{3\left(-2bce^3+4c^2de^2+3b^2fe^2+8acfe^2+2bc\sqrt{e^2-4dfe^2}-16abf^2e-8bcdfe-4c^2d\sqrt{e^2-4dfe}-2b^2f\sqrt{e^2-4dfe}-4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4dfe}}\right)}{4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4dfe}}}$$

$$+ \frac{3\left(2bce^3-4c^2de^2-3b^2fe^2-8acfe^2+2bc\sqrt{e^2-4dfe^2}+16abf^2e+8bcdfe-4c^2d\sqrt{e^2-4dfe}-2b^2f\sqrt{e^2-4dfe}-4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe+c\sqrt{e^2-4dfe}}\right)}{4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe+c\sqrt{e^2-4dfe}}}$$

$$+ \frac{3\left(2bce^3-4c^2de^2-3b^2fe^2-8acfe^2+2bc\sqrt{e^2-4dfe^2}+16abf^2e+8bcdfe-4c^2d\sqrt{e^2-4dfe}-2b^2f\sqrt{e^2-4dfe}-4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4dfe}}\right)}{4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4dfe}}}$$

$$+ \frac{3\left(-2bce^3+4c^2de^2+3b^2fe^2+8acfe^2+2bc\sqrt{e^2-4dfe^2}-16abf^2e-8bcdfe-4c^2d\sqrt{e^2-4dfe}-2b^2f\sqrt{e^2-4dfe}-4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4dfe}}\right)}{4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4dfe}}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*x + c*x^2)^(3/2)/(d + e*x + f*x^2)^3, x]

[Out] ((a + x*(b + c*x))^(3/2)*((c*d*e - 2*b*d*f + a*e*f + c*e^2*x - 2*c*d*f*x - b*e*f*x + 2*a*f^2*x)/(2*f*(-e^2 + 4*d*f)*(d + e*x + f*x^2)^2) + (2*c*e^3 + 4*c*d*e*f - 7*b*e^2*f + 4*b*d*f^2 + 12*a*e*f^2 + 2*c*e^2*f*x + 16*c*d*f^2*x - 12*b*e*f^2*x + 24*a*f^3*x)/(4*f*(-e^2 + 4*d*f)^2*(d + e*x + f*x^2))))/(a + b*x + c*x^2) + (3*(4*c^2*d*e^2 - 2*b*c*e^3 - 8*b*c*d*e*f + 3*b^2*e^2*f + 8*a*c*e^2*f + 4*b^2*d*f^2 - 16*a*b*e*f^2 + 16*a^2*f^3 - 4*c^2*d*e*Sqrt[e^2 - 4*d*f] + 2*b*c*e^2*Sqrt[e^2 - 4*d*f] + 4*b*c*d*f*Sqrt[e^2 - 4*d*f] - 2*b^2*e*f*Sqrt[e^2 - 4*d*f] - 4*a*c*e*f*Sqrt[e^2 - 4*d*f] + 4*a*b*f^2*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x]/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f])*(a + b*x + c*x^2)^(3/2)) + (3*(-4*c^2*d*e^2 + 2*b*c*e^3 + 8*b*c*d*e*f - 3*b^2*e^2*f - 8*a*c*e^2*f - 4*b^2*d*f^2 + 16*a*b*e*f^2 - 16*a^2*f^3 - 4*c^2*d*e*Sqrt[e^2 - 4*d*f] + 2*b*c*e^2*Sqrt[e^2 - 4*d*f] + 4*b*c*d*f*Sqrt[e^2 - 4*d*f] - 2*b^2*e*f*Sqrt[e^2 - 4*d*f] - 4*a*c*e*f*Sqrt[e^2 - 4*d*f] + 4*a*b*f^2*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x]/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f])*(a + b*x + c*x^2)^(3/2)) - (3*(-4*c^2*d*e^2 + 2*b*c*e^3 + 8*b*c*d*e*f - 3*b^2*e^2*f - 8*a*c*e^2*f - 4*b^2*d*f^2 + 16*a*b*e*f^2 - 16*a^2*f^3 - 4*c^2*d*e*Sqrt[e^2 - 4*d*f] + 2*b*c*e^2*Sqrt[e^2 - 4*d*f] + 4*b*c*d*f*Sqrt[e^2 - 4*d*f] - 2*b^2*e*f*Sqrt[e^2 - 4*d*f] - 4*a*c*e

$$\begin{aligned}
& *f*\sqrt{e^2 - 4*d*f} + 4*a*b*f^2*\sqrt{e^2 - 4*d*f})*(a + x*(b + c \\
& *x))^{(3/2)}*\text{Log}[b*e - 4*a*f + b*\sqrt{e^2 - 4*d*f} + 2*c*e*x - 2*b* \\
& f*x + 2*c*\sqrt{e^2 - 4*d*f}*x - 2*\sqrt{2}*\sqrt{c*e^2 - 2*c*d*f - \\
& b*e*f + 2*a*f^2 + c*e*\sqrt{e^2 - 4*d*f} - b*f*\sqrt{e^2 - 4*d*f}]]* \\
& \sqrt{a + b*x + c*x^2}]/(4*\sqrt{2}*(e^2 - 4*d*f)^{(5/2)}*\sqrt{c*e^2 \\
& - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*\sqrt{e^2 - 4*d*f} - b*f*\sqrt{e \\
& ^2 - 4*d*f}})*(a + b*x + c*x^2)^{(3/2)}) - (3*(4*c^2*d*e^2 - 2*b*c*e \\
& ^3 - 8*b*c*d*e*f + 3*b^2*e^2*f + 8*a*c*e^2*f + 4*b^2*d*f^2 - 16*a \\
& *b*e*f^2 + 16*a^2*f^3 - 4*c^2*d*e*\sqrt{e^2 - 4*d*f} + 2*b*c*e^2*S \\
& \text{qrt}[e^2 - 4*d*f] + 4*b*c*d*f*\sqrt{e^2 - 4*d*f} - 2*b^2*e*f*\sqrt{e \\
& ^2 - 4*d*f} - 4*a*c*e*f*\sqrt{e^2 - 4*d*f} + 4*a*b*f^2*\sqrt{e^2 - \\
& 4*d*f})*(a + x*(b + c*x))^{(3/2)}*\text{Log}[-(b*e) + 4*a*f + b*\sqrt{e^2 - \\
& 4*d*f} - 2*c*e*x + 2*b*f*x + 2*c*\sqrt{e^2 - 4*d*f}*x + 2*\sqrt{2} \\
& *\sqrt{c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*\sqrt{e^2 - 4*d*f} + \\
& b*f*\sqrt{e^2 - 4*d*f}}]*\sqrt{a + b*x + c*x^2}]/(4*\sqrt{2}*(e^2 - \\
& 4*d*f)^{(5/2)}*\sqrt{c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*\sqrt{e \\
& ^2 - 4*d*f} + b*f*\sqrt{e^2 - 4*d*f}})*(a + b*x + c*x^2)^{(3/2)})
\end{aligned}$$

Maple [B] time = 0.121, size = 178044, normalized size = 265.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c*x^2+b*x+a)^(3/2)/(f*x^2+e*x+d)^3,x)

[Out] result too large to display

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

$$\int \frac{(cx^2 + bx + a)^{\frac{3}{2}}}{(fx^2 + ex + d)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d)^3, x)

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2 + b*x + a)^(3/2)/(f*x^2 + e*x + d)^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((c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.742556, size = 4, normalized size = 0.01

$sage_0x$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] sage0*x
```

$$3.109 \quad \int \frac{(d+ex+fx^2)^3}{\sqrt{a+bx+cx^2}} dx$$

Optimal. Leaf size=717

$$\begin{aligned} & \frac{x\sqrt{a+bx+cx^2} (24c^2f (50a^2f^2 + 322abef + 175b^2(df+e^2)) - 252b^2cf^2(14af+15be) - 160c^3(27af(df+e^2) + 10b(6def+e^3)))}{3840c^5} \\ & + \frac{\sqrt{a+bx+cx^2} (96c^3(128a^2ef^2 + 275abf(df+e^2) + 50b^2(6def+e^3)) - 504bc^2f(22a^2f^2 + 70abef + 25b^2(df+e^2))}{7680c^6} \\ & + \frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (384c^4(3a^2f(df+e^2) + 2abe(6df+e^2) + 3b^2d(df+e^2)) + 840b^2c^2f(2a^2f^2 + 4abef + b^2(df+e^2)))}{7680c^6} \\ & - \frac{x^2\sqrt{a+bx+cx^2} (24c^2f(32aef + 35b(df+e^2)) - 36bcf^2(13af+21be) + 231b^3f^3 - 320c^3(6def+e^3))}{960c^4} \\ & + \frac{fx^3\sqrt{a+bx+cx^2} (-4cf(25af+81be) + 99b^2f^2 + 360c^2(df+e^2))}{480c^3} \\ & + \frac{f^2x^4\sqrt{a+bx+cx^2}(36ce - 11bf)}{60c^2} + \frac{f^3x^5\sqrt{a+bx+cx^2}}{6c} \end{aligned}$$

[Out] ((23040*c^5*d^2*e - 3465*b^5*f^3 + 420*b^3*c*f^2*(27*b*e + 34*a*f) - 504*b*c^2*f*(70*a*b*e*f + 22*a^2*f^2 + 25*b^2*(e^2 + d*f)) - 640*c^4*(27*b*d*(e^2 + d*f) + 8*a*e*(e^2 + 6*d*f)) + 96*c^3*(128*a^2*e*f^2 + 275*a*b*f*(e^2 + d*f) + 50*b^2*(e^3 + 6*d*e*f)))*Sqrt[a + b*x + c*x^2]/(7680*c^6) + (((1155*b^4*f^3 - 252*b^2*c*f^2*(15*b*e + 14*a*f) + 5760*c^4*d*(e^2 + d*f) + 24*c^2*f*(322*a*b*e*f + 50*a^2*f^2 + 175*b^2*(e^2 + d*f)) - 160*c^3*(27*a*f*(e^2 + d*f) + 10*b*(e^3 + 6*d*e*f)))*x*Sqrt[a + b*x + c*x^2])/(3840*c^5) - ((231*b^3*f^3 - 36*b*c*f^2*(21*b*e + 13*a*f) - 320*c^3*(e^3 + 6*d*e*f) + 24*c^2*f*(32*a*e*f + 35*b*(e^2 + d*f)))*x^2*Sqrt[a + b*x + c*x^2])/(960*c^4) + (f*(99*b^2*f^2 - 4*c*f*(81*b*e + 25*a*f) + 360*c^2*(e^2 + d*f))*x^3*Sqrt[a + b*x + c*x^2])/(480*c^3) + (f^2*(36*c*e - 11*b*f)*x^4*Sqrt[a + b*x + c*x^2])/(60*c^2) + (f^3*x^5*Sqrt[a + b*x + c*x^2])/(6*c) + (((1024*c^6*d^3 + 231*b^6*f^3 - 252*b^4*c*f^2*(3*b*e + 5*a*f) - 1536*c^5*d*(b*d*e + a*(e^2 + d*f)) + 840*b^2*c^2*f*(4*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + d*f)) + 384*c^4*(3*b^2*d*(e^2 + d*f) + 3*a^2*f*(e^2 + d*f) + 2*a*b*e*(e^2 + 6*d*f)) - 320*c^3*(9*a^2*b*e*f^2 + a^3*f^3 + 9*a*b^2*f*(e^2 + d*f) + b^3*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(1024*c^(13/2))

Rubi [A] time = 6.35417, antiderivative size = 717, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\begin{aligned} & \frac{x\sqrt{a+bx+cx^2} (24c^2f (50a^2f^2 + 322abef + 175b^2(df+e^2)) - 252b^2cf^2(14af+15be) - 160c^3(27af(df+e^2) + 10b(6 \\ & + \frac{\sqrt{a+bx+cx^2} (96c^3(128a^2ef^2 + 275abf(df+e^2) + 50b^2(6def+e^3)) - 504bc^2f(22a^2f^2 + 70abef + 25b^2(df+e^2))}{3840c^5} \\ & + \frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (384c^4(3a^2f(df+e^2) + 2abe(6df+e^2) + 3b^2d(df+e^2)) + 840b^2c^2f(2a^2f^2 + 4abef + b^2(df \\ & + \frac{x^2\sqrt{a+bx+cx^2} (24c^2f(32aef + 35b(df+e^2)) - 36bcf^2(13af+21be) + 231b^3f^3 - 320c^3(6def+e^3))}{960c^4} \\ & + \frac{fx^3\sqrt{a+bx+cx^2} (-4cf(25af+81be) + 99b^2f^2 + 360c^2(df+e^2))}{480c^3} \\ & + \frac{f^2x^4\sqrt{a+bx+cx^2}(36ce-11bf)}{60c^2} + \frac{f^3x^5\sqrt{a+bx+cx^2}}{6c} \end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)^3/Sqrt[a + b*x + c*x^2], x]

[Out] ((23040*c^5*d^2*e - 3465*b^5*f^3 + 420*b^3*c*f^2*(27*b*e + 34*a*f) - 504*b*c^2*f*(70*a*b*e*f + 22*a^2*f^2 + 25*b^2*(e^2 + d*f)) - 640*c^4*(27*b*d*(e^2 + d*f) + 8*a*e*(e^2 + 6*d*f)) + 96*c^3*(128*a^2*e*f^2 + 275*a*b*f*(e^2 + d*f) + 50*b^2*(e^3 + 6*d*e*f)))*Sqrt[a + b*x + c*x^2]/(7680*c^6) + ((1155*b^4*f^3 - 252*b^2*c*f^2*(15*b*e + 14*a*f) + 5760*c^4*d*(e^2 + d*f) + 24*c^2*f*(322*a*b*e*f + 50*a^2*f^2 + 175*b^2*(e^2 + d*f)) - 160*c^3*(27*a*f*(e^2 + d*f) + 10*b*(e^3 + 6*d*e*f)))*x*Sqrt[a + b*x + c*x^2]/(3840*c^5) - ((231*b^3*f^3 - 36*b*c*f^2*(21*b*e + 13*a*f) - 320*c^3*(e^3 + 6*d*e*f) + 24*c^2*f*(32*a*e*f + 35*b*(e^2 + d*f)))*x^2*Sqrt[a + b*x + c*x^2]/(960*c^4) + (f*(99*b^2*f^2 - 4*c*f*(81*b*e + 25*a*f) + 360*c^2*(e^2 + d*f))*x^3*Sqrt[a + b*x + c*x^2]/(480*c^3) + (f^2*(36*c*e - 11*b*f)*x^4*Sqrt[a + b*x + c*x^2]/(60*c^2) + (f^3*x^5*Sqrt[a + b*x + c*x^2]/(6*c) + ((1024*c^6*d^3 + 231*b^6*f^3 - 252*b^4*c*f^2*(3*b*e + 5*a*f) - 1536*c^5*d*(b*d*e + a*(e^2 + d*f)) + 840*b^2*c^2*f*(4*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + d*f)) + 384*c^4*(3*b^2*d*(e^2 + d*f) + 3*a^2*f*(e^2 + d*f) + 2*a*b*e*(e^2 + 6*d*f)) - 320*c^3*(9*a^2*b*e*f^2 + a^3*f^3 + 9*a*b^2*f*(e^2 + d*f) + b^3*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])]/(1024*c^(13/2)))

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(1/2),x)`

[Out] Timed out

Mathematica [A] time = 1.26095, size = 615, normalized size = 0.86

$$2\sqrt{c}\sqrt{a+x(b+cx)}(48c^3(2a^2f^2(128e+25fx)+2abf(f(275d+39fx^2)+275e^2+161efx)+b^2(6ef(100d+21fx^2)+j$$

Antiderivative was successfully verified.

[In] `Integrate[(d + e*x + f*x^2)^3/Sqrt[a + b*x + c*x^2],x]`

[Out] $(2\sqrt{c}\sqrt{a+x(b+cx)})^3(-3465b^5f^3+210b^3c^2f^2(54b^2e+68af+11b^2fx)-168b^2c^2f(66a^2f^2+42ab^2f(5e+fx)+b^2(75e^2+75df+45efx+11f^2x^2))+128c^5(90d^2(2e+fx)+15d^2x(6e^2+8efx+3f^2x^2)+x^2(20e^3+45e^2fx+36ef^2x^2+10f^3x^3))+48c^3(2a^2f^2(128e+25fx)+b^2(100e^3+175e^2fx+6ef(100d+21fx^2)+f^2x(175d+33fx^2))+2ab^2f(275e^2+161efx+f(275d+39fx^2)))-64c^4(a(80e^3+135e^2fx+96ef(5d+fx^2))+5f^2x(27d+5fx^2))+b(270d^2f+15d(18e^2+20efx+7f^2x^2)+x(50e^3+105e^2fx+81ef^2x^2+22f^3x^3)))+15(1024c^6d^3+231b^6f^3-252b^4c^2f^2(3b^2e+5af)-1536c^5d(b^2de+a(e^2+df))+840b^2c^2f(4ab^2ef+2a^2f^2+b^2(e^2+df))+384c^4(3b^2d(e^2+df)+3a^2f(e^2+df)+2ab^2e(e^2+6df))-320c^3(9a^2b^2ef^2+a^3f^3+9ab^2f(e^2+df))+b^3(e^3+6de^2f)))*Log[b+2cx+2\sqrt{c}\sqrt{a+x(b+cx)}]/(15360c^{13/2})$

Maple [B] time = 0.033, size = 1930, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((f*x^2+e*x+d)^3/(c*x^2+b*x+a)^(1/2),x)`

[Out] $9/2b/c^{5/2}a\ln((1/2b+cx)/c^{1/2}+(c^2x^2+bx+a)^{1/2})^2d^2ef+161/80e^2f^2b/c^3a^2x(c^2x^2+bx+a)^{1/2}-5/2b/c^2x(c^2x^2+bx+a)^{1/2}d^2ef-147/32e^2f^2b^2/c^4a(c^2x^2+bx+a)^{1/2}-9/8/c^2a^2x(c^2x^2+bx+a)^{1/2}e^2f+55/16b/c^3a(c^2x^2+bx+a)^{1/2}$

$$\begin{aligned}
&) * d * f^2 + 55/16 * b / c^3 * a * (c * x^2 + b * x + a)^{(1/2)} * e^2 * f - 9/8 / c^2 * a * x * (c * x^2 + b * x + a)^{(1/2)} * d * f^2 - 4 / c^2 * a * (c * x^2 + b * x + a)^{(1/2)} * d * e * f - 7/8 * b / c^2 * x^2 * (c * x^2 + b * x + a)^{(1/2)} * d * f^2 - 7/8 * b / c^2 * x^2 * (c * x^2 + b * x + a)^{(1/2)} * e^2 * f + 35/32 * b^2 / c^3 * x * (c * x^2 + b * x + a)^{(1/2)} * d * f^2 + 35/32 * b^2 / c^3 * x * (c * x^2 + b * x + a)^{(1/2)} * e^2 * f - 45/16 * b^2 / c^{(7/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * d * f^2 - 45/16 * b^2 / c^{(7/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^2 * f - 147/160 * f^3 * b^2 / c^4 * a * x * (c * x^2 + b * x + a)^{(1/2)} + 39/80 * f^3 * b / c^3 * a * x^2 * (c * x^2 + b * x + a)^{(1/2)} + 2 * x^2 / c * (c * x^2 + b * x + a)^{(1/2)} * d * e * f + 15/4 * b^2 / c^3 * (c * x^2 + b * x + a)^{(1/2)} * d * e * f - 15/8 * b^3 / c^{(7/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * d * e * f - 45/16 * e * f^2 * b / c^{(7/2)} * a^2 * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} - 4/5 * e * f^2 / c^2 * a * x^2 * (c * x^2 + b * x + a)^{(1/2)} - 27/40 * e * f^2 * b / c^2 * x^3 * (c * x^2 + b * x + a)^{(1/2)} + 63/80 * e * f^2 * b^2 / c^3 * x^2 * (c * x^2 + b * x + a)^{(1/2)} - 63/64 * e * f^2 * b^3 / c^4 * x * (c * x^2 + b * x + a)^{(1/2)} + 105/32 * e * f^2 * b^3 / c^4 * (9/2) * a * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} + 1/3 * x^2 / c * (c * x^2 + b * x + a)^{(1/2)} * e^3 - 231/512 * f^3 * b^5 / c^6 * (c * x^2 + b * x + a)^{(1/2)} + 231/1024 * f^3 * b^6 / c^{(13/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} - 5/16 * f^3 / c^{(7/2)} * a^3 * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} + 3 * d^2 * e / c * (c * x^2 + b * x + a)^{(1/2)} + 5/8 * b^2 / c^3 * (c * x^2 + b * x + a)^{(1/2)} * e^3 - 5/16 * b^3 / c^{(7/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^3 - 2/3 / c^2 * a * (c * x^2 + b * x + a)^{(1/2)} * e^3 + 3/4 * x^3 / c * (c * x^2 + b * x + a)^{(1/2)} * d * f^2 + 1/6 * f^3 * x^5 * (c * x^2 + b * x + a)^{(1/2)} / c + d^3 * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} / c^{(1/2)} + 9/8 / c^{(5/2)} * a^2 * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * d * f^2 + 9/8 / c^{(5/2)} * a^2 * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^2 * f + 3/4 * x^3 / c * (c * x^2 + b * x + a)^{(1/2)} * e^2 * f + 9/8 * b^2 / c^{(5/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * f * d^2 + 9/8 * b^2 / c^{(5/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^2 * d - 3/2 * a / c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * f * d^2 - 3/2 * a / c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^2 * d - 105/64 * b^3 / c^4 * (c * x^2 + b * x + a)^{(1/2)} * d * f^2 - 105/64 * b^3 / c^4 * (c * x^2 + b * x + a)^{(1/2)} * e^2 * f + 105/128 * b^4 / c^{(9/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * d * f^2 + 105/128 * b^4 / c^{(9/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^2 * f - 9/4 * b / c^2 * (c * x^2 + b * x + a)^{(1/2)} * f * d^2 - 9/4 * b / c^2 * (c * x^2 + b * x + a)^{(1/2)} * e^2 * d + 3/2 * x / c * (c * x^2 + b * x + a)^{(1/2)} * f * d^2 + 3/2 * x / c * (c * x^2 + b * x + a)^{(1/2)} * e^2 * d + 8/5 * e * f^2 / c^3 * a^2 * (c * x^2 + b * x + a)^{(1/2)} - 3/2 * d^2 * e * b / c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} + 77/256 * f^3 * b^4 / c^5 * x * (c * x^2 + b * x + a)^{(1/2)} - 315/256 * f^3 * b^4 / c^{(11/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} + 119/64 * f^3 * b^3 / c^5 * a * (c * x^2 + b * x + a)^{(1/2)} + 105/64 * f^3 * b^2 / c^{(9/2)} * a^2 * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} + 3/5 * e * f^2 * x^4 / c * (c * x^2 + b * x + a)^{(1/2)} + 189/128 * e * f^2 * b^4 / c^5 * (c * x^2 + b * x + a)^{(1/2)} - 189/256 * e * f^2 * b^5 / c^{(11/2)} * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} + 33/160 * f^3 * b^2 / c^3 * x^3 * (c * x^2 + b * x + a)^{(1/2)} - 77/320 * f^3 * b^3 / c^4 * x^2 * (c * x^2 + b * x + a)^{(1/2)} + 5/16 * f^3 / c^3 * a^2 * x * (c * x^2 + b * x + a)^{(1/2)} - 5/12 * b / c^2 * x * (c * x^2 + b * x + a)^{(1/2)} * e^3 + 3/4 * b / c^{(5/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)}) + (c * x^2 + b * x + a)^{(1/2)} * e^3 - 11/60 * f^3 * b / c^2 * x^4 * (c * x^2 + b * x + a)^{(1/2)} - 231/160 * f^3 * b / c^4 * a^2 * (c * x^2 + b * x + a)^{(1/2)} - 5/24 * f^3 / c^2 * a * x^3 * (c * x^2 + b * x + a)^{(1/2)}
\end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x^2 + e*x + d)^3/sqrt(c*x^2 + b*x + a),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.45333, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x^2 + e*x + d)^3/sqrt(c*x^2 + b*x + a),x, algorithm="fricas")`

[Out]
$$\begin{aligned} & [1/30720 * (4 * (1280 * c^5 * f^3 * x^5 + 23040 * c^5 * d^2 * e - 17280 * b * c^4 * d * e \\ & \wedge 2 + 128 * (36 * c^5 * e * f^2 - 11 * b * c^4 * f^3) * x^4 + 320 * (15 * b^2 * c^3 - 16 \\ & * a * c^4) * e^3 - 21 * (165 * b^5 - 680 * a * b^3 * c + 528 * a^2 * b * c^2) * f^3 + 16 \\ & * (360 * c^5 * e^2 * f + (99 * b^2 * c^3 - 100 * a * c^4) * f^3 + 36 * (10 * c^5 * d - 9 \\ & * b * c^4 * e) * f^2) * x^3 - 12 * (50 * (21 * b^3 * c^2 - 44 * a * b * c^3) * d - (945 * b^4 \\ & * c - 2940 * a * b^2 * c^2 + 1024 * a^2 * c^3) * e) * f^2 + 8 * (320 * c^5 * e^3 - 3 * \\ & (77 * b^3 * c^2 - 156 * a * b * c^3) * f^3 - 12 * (70 * b * c^4 * d - (63 * b^2 * c^3 - 6 \\ & 4 * a * c^4) * e) * f^2 + 120 * (16 * c^5 * d * e - 7 * b * c^4 * e^2) * f) * x^2 - 120 * (14 \\ & 4 * b * c^4 * d^2 - 16 * (15 * b^2 * c^3 - 16 * a * c^4) * d * e + 5 * (21 * b^3 * c^2 - 44 \\ & * a * b * c^3) * e^2) * f + 2 * (5760 * c^5 * d * e^2 - 1600 * b * c^4 * e^3 + 3 * (385 * b^4 \\ & 4 * c - 1176 * a * b^2 * c^2 + 400 * a^2 * c^3) * f^3 + 12 * (10 * (35 * b^2 * c^3 - 36 \\ & * a * c^4) * d - 7 * (45 * b^3 * c^2 - 92 * a * b * c^3) * e) * f^2 + 120 * (48 * c^5 * d^2 \\ & - 80 * b * c^4 * d * e + (35 * b^2 * c^3 - 36 * a * c^4) * e^2) * f) * x) * \text{sqrt}(c * x^2 + \\ & b * x + a) * \text{sqrt}(c) - 15 * (1024 * c^6 * d^3 - 1536 * b * c^5 * d^2 * e + 384 * (3 * b \\ & ^2 * c^4 - 4 * a * c^5) * d * e^2 - 64 * (5 * b^3 * c^3 - 12 * a * b * c^4) * e^3 + (231 * \\ & b^6 - 1260 * a * b^4 * c + 1680 * a^2 * b^2 * c^2 - 320 * a^3 * c^3) * f^3 + 12 * (2 * \\ & (35 * b^4 * c^2 - 120 * a * b^2 * c^3 + 48 * a^2 * c^4) * d - (63 * b^5 * c - 280 * a * b \\ & ^3 * c^2 + 240 * a^2 * b * c^3) * e) * f^2 + 24 * (16 * (3 * b^2 * c^4 - 4 * a * c^5) * d^2 \\ & - 16 * (5 * b^3 * c^3 - 12 * a * b * c^4) * d * e + (35 * b^4 * c^2 - 120 * a * b^2 * c^3 \\ & + 48 * a^2 * c^4) * e^2) * f) * \log(4 * (2 * c^2 * x + b * c) * \text{sqrt}(c * x^2 + b * x + a) \\ & - (8 * c^2 * x^2 + 8 * b * c * x + b^2 + 4 * a * c) * \text{sqrt}(c)) / c^{13/2}, 1/1536 \\ & 0 * (2 * (1280 * c^5 * f^3 * x^5 + 23040 * c^5 * d^2 * e - 17280 * b * c^4 * d * e^2 + 12 \\ & 8 * (36 * c^5 * e * f^2 - 11 * b * c^4 * f^3) * x^4 + 320 * (15 * b^2 * c^3 - 16 * a * c^4) \\ & * e^3 - 21 * (165 * b^5 - 680 * a * b^3 * c + 528 * a^2 * b * c^2) * f^3 + 16 * (360 * c \\ & ^5 * e^2 * f + (99 * b^2 * c^3 - 100 * a * c^4) * f^3 + 36 * (10 * c^5 * d - 9 * b * c^4 * \\ & e) * f^2) * x^3 - 12 * (50 * (21 * b^3 * c^2 - 44 * a * b * c^3) * d - (945 * b^4 * c - 2 \\ & 940 * a * b^2 * c^2 + 1024 * a^2 * c^3) * e) * f^2 + 8 * (320 * c^5 * e^3 - 3 * (77 * b^3 \\ & * c^2 - 156 * a * b * c^3) * f^3 - 12 * (70 * b * c^4 * d - (63 * b^2 * c^3 - 64 * a * c^4 \\ &) * e) * f^2 + 120 * (16 * c^5 * d * e - 7 * b * c^4 * e^2) * f) * x^2 - 120 * (144 * b * c^4 \end{aligned}$$

$$\begin{aligned}
& d^2 - 16(15b^2c^3 - 16a^2c^4)d^2e + 5(21b^3c^2 - 44ab^2c^3)e^2) * f + 2(5760c^5d^2e^2 - 1600b^2c^4e^3 + 3(385b^4c - 1 \\
& 176ab^2c^2 + 400a^2c^3) * f^3 + 12(10(35b^2c^3 - 36a^2c^4) \\
& * d - 7(45b^3c^2 - 92ab^2c^3) * e) * f^2 + 120(48c^5d^2 - 80b^2 \\
& c^4d^2e + (35b^2c^3 - 36a^2c^4) * e^2) * f) * x) * \sqrt{cx^2 + bx + a} \\
& * \sqrt{-c} + 15(1024c^6d^3 - 1536b^2c^5d^2e + 384(3b^2c^4 \\
& - 4a^2c^5) * d^2e^2 - 64(5b^3c^3 - 12ab^2c^4) * e^3 + (231b^6 - \\
& 1260ab^4c + 1680a^2b^2c^2 - 320a^3c^3) * f^3 + 12(2(35b^4 \\
& 4c^2 - 120ab^2c^3 + 48a^2c^4) * d - (63b^5c - 280ab^3c^2 \\
& + 240a^2b^2c^3) * e) * f^2 + 24(16(3b^2c^4 - 4a^2c^5) * d^2 - 16 \\
& (5b^3c^3 - 12ab^2c^4) * d^2e + (35b^4c^2 - 120ab^2c^3 + 48a^2 \\
& c^4) * e^2) * f) * \arctan(1/2(2cx + b) * \sqrt{-c} / (\sqrt{cx^2 + bx + a} * c)) / (\sqrt{-c} * c^6)
\end{aligned}$$

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

$$\int \frac{(d + ex + fx^2)^3}{\sqrt{a + bx + cx^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(1/2),x)

[Out] Integral((d + e*x + f*x**2)**3/sqrt(a + b*x + c*x**2), x)

GIAC/XCAS [A] time = 0.29312, size = 1112, normalized size = 1.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^3/sqrt(c*x^2 + b*x + a),x, algorithm="giac")

[Out] $\frac{1}{7680} \sqrt{cx^2 + bx + a} (2(4(2(8(10f^3x/c - (11b^2c^4f^3 - 36c^5f^2e)/c^6)x + (360c^5d^2f^2 + 99b^2c^3f^3 - 100a^2c^4f^3 - 324b^2c^4f^2e + 360c^5f^2e^2)/c^6)x - (840b^2c^4d^2f^2 + 231b^3c^2f^3 - 468ab^2c^3f^3 - 1920c^5d^2f^2e - 756b^2c^3f^2e + 768a^2c^4f^2e + 840b^2c^4f^2e^2 - 320c^5e^3)/c^6)x + (5760c^5d^2f^2 + 4200b^2c^3d^2f^2 - 4320a^2c^4d^2f^2 + 1155b^4c^2f^3 - 3528ab^2c^2f^3 + 1200a^2c^3f^3 - 9600b^2c^4d^2f^2e - 3780b^3c^2f^2e + 7728ab^2c^3f^2e + 5760c^5d^2e^2 + 4200b^2c^3f^2e^2 - 4320a^2c^4f^2e^2 - 1600b^2c^4e^3)/c^6)x - (17280b^2c^4d^2f^2 + 12600b^3c^2d^2f^2 - 26400ab^2c^3d^2f^2 + 3465b^5f^3 - 14280ab^3c^2f^3 + 11088a^2b^2c^2f^3 -$

$$\begin{aligned}
& 23040*c^5*d^2*e - 28800*b^2*c^3*d*f*e + 30720*a*c^4*d*f*e - 1134 \\
& 0*b^4*c*f^2*e + 35280*a*b^2*c^2*f^2*e - 12288*a^2*c^3*f^2*e + 172 \\
& 80*b*c^4*d*e^2 + 12600*b^3*c^2*f*e^2 - 26400*a*b*c^3*f*e^2 - 4800 \\
& *b^2*c^3*e^3 + 5120*a*c^4*e^3)/c^6) - 1/1024*(1024*c^6*d^3 + 1152 \\
& *b^2*c^4*d^2*f - 1536*a*c^5*d^2*f + 840*b^4*c^2*d*f^2 - 2880*a*b^4 \\
& 2*c^3*d*f^2 + 1152*a^2*c^4*d*f^2 + 231*b^6*f^3 - 1260*a*b^4*c*f^3 \\
& + 1680*a^2*b^2*c^2*f^3 - 320*a^3*c^3*f^3 - 1536*b*c^5*d^2*e - 19 \\
& 20*b^3*c^3*d*f*e + 4608*a*b*c^4*d*f*e - 756*b^5*c*f^2*e + 3360*a* \\
& b^3*c^2*f^2*e - 2880*a^2*b*c^3*f^2*e + 1152*b^2*c^4*d*e^2 - 1536* \\
& a*c^5*d*e^2 + 840*b^4*c^2*f*e^2 - 2880*a*b^2*c^3*f*e^2 + 1152*a^2 \\
& *c^4*f*e^2 - 320*b^3*c^3*e^3 + 768*a*b*c^4*e^3)*ln(abs(-2*(sqrt(c \\
&)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(13/2)
\end{aligned}$$

$$3.110 \quad \int \frac{(d+ex+fx^2)^2}{\sqrt{a+bx+cx^2}} dx$$

Optimal. Leaf size=316

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (48c^2 (a^2 f^2 + 4abef + b^2 (2df + e^2)) - 40b^2 cf(3af + 2be) - 64c^3 (a(2df + e^2) + 2bde) + 35b^4 f^2)}{128c^{9/2}} + \frac{\sqrt{a+bx+cx^2} (-16c^2 (16aef + 9b(2df + e^2)) + 20bcf(11af + 12be) - 105b^3 f^2 + 384c^3 de)}{192c^4} + \frac{x\sqrt{a+bx+cx^2} (-4cf(9af + 20be) + 35b^2 f^2 + 48c^2 (2df + e^2))}{96c^3} + \frac{fx^2\sqrt{a+bx+cx^2}(16ce - 7bf)}{24c^2} + \frac{f^2 x^3 \sqrt{a+bx+cx^2}}{4c}$$

[Out] ((384*c^3*d*e - 105*b^3*f^2 + 20*b*c*f*(12*b*e + 11*a*f) - 16*c^2*(16*a*e*f + 9*b*(e^2 + 2*d*f)))*Sqrt[a + b*x + c*x^2])/(192*c^4) + ((35*b^2*f^2 - 4*c*f*(20*b*e + 9*a*f) + 48*c^2*(e^2 + 2*d*f))*x*Sqrt[a + b*x + c*x^2])/(96*c^3) + (f*(16*c*e - 7*b*f)*x^2*Sqrt[a + b*x + c*x^2])/(24*c^2) + (f^2*x^3*Sqrt[a + b*x + c*x^2])/(4*c) + (((128*c^4*d^2 + 35*b^4*f^2 - 40*b^2*c*f*(2*b*e + 3*a*f) - 64*c^3*(2*b*d*e + a*(e^2 + 2*d*f)) + 48*c^2*(4*a*b*e*f + a^2*f^2 + b^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(128*c^(9/2))

Rubi [A] time = 1.1901, antiderivative size = 316, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (48c^2 (a^2 f^2 + 4abef + b^2 (2df + e^2)) - 40b^2 cf(3af + 2be) - 64c^3 (a(2df + e^2) + 2bde) + 35b^4 f^2)}{128c^{9/2}} + \frac{\sqrt{a+bx+cx^2} (-16c^2 (16aef + 9b(2df + e^2)) + 20bcf(11af + 12be) - 105b^3 f^2 + 384c^3 de)}{192c^4} + \frac{x\sqrt{a+bx+cx^2} (-4cf(9af + 20be) + 35b^2 f^2 + 48c^2 (2df + e^2))}{96c^3} + \frac{fx^2\sqrt{a+bx+cx^2}(16ce - 7bf)}{24c^2} + \frac{f^2 x^3 \sqrt{a+bx+cx^2}}{4c}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)^2/Sqrt[a + b*x + c*x^2], x]

[Out] ((384*c^3*d*e - 105*b^3*f^2 + 20*b*c*f*(12*b*e + 11*a*f) - 16*c^2*(16*a*e*f + 9*b*(e^2 + 2*d*f)))*Sqrt[a + b*x + c*x^2])/(192*c^4) + ((35*b^2*f^2 - 4*c*f*(20*b*e + 9*a*f) + 48*c^2*(e^2 + 2*d*f))*x*Sqrt[a + b*x + c*x^2])/(96*c^3) + (f*(16*c*e - 7*b*f)*x^2*Sqrt[a + b*x + c*x^2])/(24*c^2) + (f^2*x^3*Sqrt[a + b*x + c*x^2])/(4*c)

$$\frac{x\sqrt{a + b^2x + c^2x^2}}{(96c^3) + (f(16c^2e - 7b^2f)x^2\sqrt{a + b^2x + c^2x^2})/(24c^2) + (f^2x^3\sqrt{a + b^2x + c^2x^2})/(4c)} + \frac{((128c^4d^2 + 35b^4f^2 - 40b^2c^2f(2b^2e + 3a^2f) - 64c^3(2b^2d^2e + a^2(e^2 + 2d^2f)) + 48c^2(4a^2b^2e^2f + a^2f^2 + b^2(e^2 + 2d^2f)))\text{ArcTanh}[(b + 2cx)/(2\sqrt{c}\sqrt{a + b^2x + c^2x^2})])}{(128c^{9/2})}$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(1/2),x)`

[Out] Timed out

Mathematica [A] time = 0.442964, size = 251, normalized size = 0.79

$$3 \log \left(2\sqrt{c}\sqrt{a + x(b + cx)} + b + 2cx \right) (48c^2 (a^2f^2 + 4abef + b^2(2df + e^2)) - 40b^2cf(3af + 2be) - 64c^3 (a(2df + e^2) + 2b^2e^2))$$

Antiderivative was successfully verified.

[In] `Integrate[(d + e*x + f*x^2)^2/Sqrt[a + b*x + c*x^2],x]`

[Out] $(2\sqrt{c}\sqrt{a + x(b + c^2x)})^2(-105b^3f^2 + 10b^2c^2f(24b^2e + 22a^2f + 7b^2f^2x) + 16c^3(12d^2(2e + f^2x) + x(6e^2 + 8e^2f^2x + 3f^2x^2)) - 8c^2(a^2f(32e + 9f^2x) + b(18e^2 + 36d^2f + 20e^2f^2x + 7f^2x^2))) + 3(128c^4d^2 + 35b^4f^2 - 40b^2c^2f(2b^2e + 3a^2f) - 64c^3(2b^2d^2e + a^2(e^2 + 2d^2f)) + 48c^2(4a^2b^2e^2f + a^2f^2 + b^2(e^2 + 2d^2f)))\text{Log}[b + 2cx + 2\sqrt{c}\sqrt{a + x(b + c^2x)}])/(384c^{9/2})$

Maple [B] time = 0.019, size = 706, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int((f*x^2+e*x+d)^2/(c*x^2+b*x+a)^(1/2),x)`

[Out]
$$-4/3 * e * f / c^2 * a * (c * x^2 + b * x + a)^{(1/2)} + 2/3 * e * f * x^2 / c * (c * x^2 + b * x + a)^{(1/2)} + x / c * (c * x^2 + b * x + a)^{(1/2)} * d * f - 3/2 * b / c^2 * (c * x^2 + b * x + a)^{(1/2)} * d * f + 3/4 * b^2 / c^{(5/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * d * f - a / c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * d * f - d * e * b / c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) - 7/24 * f^2 * b / c^2 * x^2 * (c * x^2 + b * x + a)^{(1/2)} + 35/96 * f^2 * b^2 / c^3 * x * (c * x^2 + b * x + a)^{(1/2)} - 15/16 * f^2 * b^2 / c^{(7/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) + 55/48 * f^2 * b / c^3 * a * (c * x^2 + b * x + a)^{(1/2)} - 3/8 * f^2 / c^2 * a * x * (c * x^2 + b * x + a)^{(1/2)} - 5/8 * e * f * b^3 / c^{(7/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) + 5/4 * e * f * b^2 / c^3 * (c * x^2 + b * x + a)^{(1/2)} + 35/128 * f^2 * b^4 / c^{(9/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) + 3/8 * f^2 / c^{(5/2)} * a^2 * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) + 2 * d * e / c * (c * x^2 + b * x + a)^{(1/2)} + 1/2 * x / c * (c * x^2 + b * x + a)^{(1/2)} * e^2 - 3/4 * b / c^2 * (c * x^2 + b * x + a)^{(1/2)} * e^2 + 3/8 * b^2 / c^{(5/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * e^2 - 1/2 * a / c^{(3/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * e^2 - 35/64 * f^2 * b^3 / c^4 * (c * x^2 + b * x + a)^{(1/2)} - 5/6 * e * f * b / c^2 * x * (c * x^2 + b * x + a)^{(1/2)} + 3/2 * e * f * b / c^{(5/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) + 1/4 * f^2 * x^3 * (c * x^2 + b * x + a)^{(1/2)} / c + d^2 * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) / c^{(1/2)}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x^2 + e*x + d)^2/sqrt(c*x^2 + b*x + a),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 0.845185, size = 1, normalized size = 0.

$$\left[\frac{4(48c^3f^2x^3 + 384c^3de - 144bc^2e^2 - 5(21b^3 - 44abc)f^2 + 8(16c^3ef - 7bc^2f^2)x^2 - 16(18bc^2d - (15b^2c - 16ac^2)e)}{\dots} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x^2 + e*x + d)^2/sqrt(c*x^2 + b*x + a),x, algorithm="fricas")`

[Out]
$$[1/768 * (4 * (48 * c^3 * f^2 * x^3 + 384 * c^3 * d * e - 144 * b * c^2 * e^2 - 5 * (21 * b^3 - 44 * a * b * c) * f^2 + 8 * (16 * c^3 * e * f - 7 * b * c^2 * f^2) * x^2 - 16 * (18 * b^2 * c - 16 * a * c^2) * e) / (c * x^2 + b * x + a)^{(1/2)} + \dots]$$

$$c^2*d - (15*b^2*c - 16*a*c^2)*e)*f + 2*(48*c^3*e^2 + (35*b^2*c - 36*a*c^2)*f^2 + 16*(6*c^3*d - 5*b*c^2*e)*f)*x)*\sqrt{c*x^2 + b*x + a)*\sqrt{c} + 3*(128*c^4*d^2 - 128*b*c^3*d*e + 16*(3*b^2*c^2 - 4*a*c^3)*e^2 + (35*b^4 - 120*a*b^2*c + 48*a^2*c^2)*f^2 + 16*(2*(3*b^2*c^2 - 4*a*c^3)*d - (5*b^3*c - 12*a*b*c^2)*e)*f)*\log(-4*(2*c^2*x + b*c)*\sqrt{c*x^2 + b*x + a} - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*\sqrt{c}))/c^{(9/2)}, 1/384*(2*(48*c^3*f^2*x^3 + 384*c^3*d*e - 144*b*c^2*e^2 - 5*(21*b^3 - 44*a*b*c)*f^2 + 8*(16*c^3*e*f - 7*b*c^2*f^2)*x^2 - 16*(18*b*c^2*d - (15*b^2*c - 16*a*c^2)*e)*f + 2*(48*c^3*e^2 + (35*b^2*c - 36*a*c^2)*f^2 + 16*(6*c^3*d - 5*b*c^2*e)*f)*x)*\sqrt{c*x^2 + b*x + a)*\sqrt{-c} + 3*(128*c^4*d^2 - 128*b*c^3*d*e + 16*(3*b^2*c^2 - 4*a*c^3)*e^2 + (35*b^4 - 120*a*b^2*c + 48*a^2*c^2)*f^2 + 16*(2*(3*b^2*c^2 - 4*a*c^3)*d - (5*b^3*c - 12*a*b*c^2)*e)*f)*\arctan(1/2*(2*c*x + b)*\sqrt{-c}/(\sqrt{c*x^2 + b*x + a}*c)))/(\sqrt{-c}*c^4)]$$

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

$$\int \frac{(d + ex + fx^2)^2}{\sqrt{a + bx + cx^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(1/2),x)

[Out] Integral((d + e*x + f*x**2)**2/sqrt(a + b*x + c*x**2), x)

GIAC/XCAS [A] time = 0.285053, size = 410, normalized size = 1.3

$$\frac{1}{192} \sqrt{cx^2 + bx + a} \left(2 \left(4 \left(\frac{6f^2x}{c} - \frac{7bc^2f^2 - 16c^3fe}{c^4} \right) x + \frac{96c^3df + 35b^2cf^2 - 36ac^2f^2 - 80bc^2fe + 48c^3e^2}{c^4} \right) x - \frac{288bc^2}{128c^{\frac{9}{2}}} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^2/sqrt(c*x^2 + b*x + a),x, algorithm="giac")

[Out] 1/192*sqrt(c*x^2 + b*x + a)*(2*(4*(6*f^2*x/c - (7*b*c^2*f^2 - 16*c^3*f*e)/c^4)*x + (96*c^3*d*f + 35*b^2*c*f^2 - 36*a*c^2*f^2 - 80*b*c^2*f*e + 48*c^3*e^2)/c^4)*x - (288*b*c^2*d*f + 105*b^3*f^2 - 220*a*b*c*f^2 - 384*c^3*d*e - 240*b^2*c*f*e + 256*a*c^2*f*e + 144*b*c^2*e^2)/c^4) - 1/128*(128*c^4*d^2 + 96*b^2*c^2*d*f - 128*a*c^3

$$\begin{aligned} & *d*f + 35*b^4*f^2 - 120*a*b^2*c*f^2 + 48*a^2*c^2*f^2 - 128*b*c^3* \\ & d*e - 80*b^3*c*f*e + 192*a*b*c^2*f*e + 48*b^2*c^2*e^2 - 64*a*c^3* \\ & e^2)*\ln(\text{abs}(-2*(\text{sqrt}(c)*x - \text{sqrt}(c*x^2 + b*x + a))*\text{sqrt}(c) - b))/ \\ & c^{9/2}) \end{aligned}$$

$$3.111 \quad \int \frac{d+ex+fx^2}{\sqrt{a+bx+cx^2}} dx$$

Optimal. Leaf size=116

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-4c(af+be) + 3b^2f + 8c^2d)}{8c^{5/2}} + \frac{\sqrt{a+bx+cx^2}(4ce-3bf)}{4c^2} + \frac{fx\sqrt{a+bx+cx^2}}{2c}$$

[Out] $((4*c*e - 3*b*f)*\text{Sqrt}[a + b*x + c*x^2])/(4*c^2) + (f*x*\text{Sqrt}[a + b*x + c*x^2])/(2*c) + ((8*c^2*d + 3*b^2*f - 4*c*(b*e + a*f))*\text{ArcTanh}[(b + 2*c*x)/(2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2])])/(8*c^{(5/2)})$

Rubi [A] time = 0.214815, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (-4c(af+be) + 3b^2f + 8c^2d)}{8c^{5/2}} + \frac{\sqrt{a+bx+cx^2}(4ce-3bf)}{4c^2} + \frac{fx\sqrt{a+bx+cx^2}}{2c}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)/Sqrt[a + b*x + c*x^2], x]

[Out] $((4*c*e - 3*b*f)*\text{Sqrt}[a + b*x + c*x^2])/(4*c^2) + (f*x*\text{Sqrt}[a + b*x + c*x^2])/(2*c) + ((8*c^2*d + 3*b^2*f - 4*c*(b*e + a*f))*\text{ArcTanh}[(b + 2*c*x)/(2*\text{Sqrt}[c]*\text{Sqrt}[a + b*x + c*x^2])])/(8*c^{(5/2)})$

Rubi in Sympy [A] time = 15.7553, size = 97, normalized size = 0.84

$$-\frac{\sqrt{a+bx+cx^2}\left(\frac{3bf}{2} - 2ce - cfx\right)}{2c^2} + \frac{(-4acf + 3b^2f - 4bce + 8c^2d) \operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{8c^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(1/2), x)

[Out] $-\text{sqrt}(a + b*x + c*x^2)*(3*b*f/2 - 2*c*e - c*f*x)/(2*c^2) + (-4*a*c*f + 3*b^2*f - 4*b*c*e + 8*c^2*d)*\text{atanh}((b + 2*c*x)/(2*\text{sqrt}(c)*\text{sqrt}(a + b*x + c*x^2)))/(8*c^{(5/2)})$

Mathematica [A] time = 0.147425, size = 95, normalized size = 0.82

$$\frac{\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(-4c(af+be)+3b^2f+8c^2d\right)+2\sqrt{c}\sqrt{a+x(b+cx)}(-3bf+4ce+2cfx)}{8c^{5/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(d + e*x + f*x^2)/Sqrt[a + b*x + c*x^2], x]

[Out] (2*Sqrt[c]*(4*c*e - 3*b*f + 2*c*f*x)*Sqrt[a + x*(b + c*x)] + (8*c^2*d + 3*b^2*f - 4*c*(b*e + a*f))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)])/(8*c^(5/2))

Maple [A] time = 0.009, size = 185, normalized size = 1.6

$$\begin{aligned} & d \ln\left(1\left(\frac{b}{2} + cx\right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a}\right) \frac{1}{\sqrt{c}} + \frac{e}{c} \sqrt{cx^2 + bx + a} \\ & - \frac{be}{2} \ln\left(1\left(\frac{b}{2} + cx\right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a}\right) c^{-\frac{3}{2}} + \frac{fx}{2c} \sqrt{cx^2 + bx + a} - \frac{3bf}{4c^2} \sqrt{cx^2 + bx + a} \\ & + \frac{3b^2f}{8} \ln\left(1\left(\frac{b}{2} + cx\right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a}\right) c^{-\frac{5}{2}} - \frac{fa}{2} \ln\left(1\left(\frac{b}{2} + cx\right) \frac{1}{\sqrt{c}} + \sqrt{cx^2 + bx + a}\right) c^{-\frac{3}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x^2+e*x+d)/(c*x^2+b*x+a)^(1/2), x)

[Out] d*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))/c^(1/2)+e/c*(c*x^2+b*x+a)^(1/2)-1/2*e*b/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+1/2*f*x*(c*x^2+b*x+a)^(1/2)/c-3/4*f*b/c^2*(c*x^2+b*x+a)^(1/2)+3/8*f*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-1/2*f*a/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)/sqrt(c*x^2 + b*x + a), x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 0.571157, size = 1, normalized size = 0.01

$$\left[\frac{4(2cfx + 4ce - 3bf)\sqrt{cx^2 + bx + a}\sqrt{c} - (8c^2d - 4bce + (3b^2 - 4ac)f) \log\left(4(2c^2x + bc)\sqrt{cx^2 + bx + a} - (8c^2x^2 + 8b^2cx + 4a^2)\sqrt{c}\right)}{16c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)/sqrt(c*x^2 + b*x + a), x, algorithm="fricas")

[Out] [1/16*(4*(2*c*f*x + 4*c*e - 3*b*f)*sqrt(c*x^2 + b*x + a)*sqrt(c) - (8*c^2*d - 4*b*c*e + (3*b^2 - 4*a*c)*f)*log(4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c^(5/2), 1/8*(2*(2*c*f*x + 4*c*e - 3*b*f)*sqrt(c*x^2 + b*x + a)*sqrt(-c) + (8*c^2*d - 4*b*c*e + (3*b^2 - 4*a*c)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/(sqrt(-c)*c^2)]

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

$$\int \frac{d + ex + fx^2}{\sqrt{a + bx + cx^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(1/2), x)

[Out] Integral((d + e*x + f*x**2)/sqrt(a + b*x + c*x**2), x)

GIAC/XCAS [A] time = 0.282181, size = 132, normalized size = 1.14

$$\frac{1}{4} \sqrt{cx^2 + bx + a} \left(\frac{2fx}{c} - \frac{3bf - 4ce}{c^2} \right) - \frac{(8c^2d + 3b^2f - 4acf - 4bce) \ln \left(\left| -2 \left(\sqrt{cx} - \sqrt{cx^2 + bx + a} \right) \sqrt{c} - b \right| \right)}{8c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)/sqrt(c*x^2 + b*x + a),x, algorithm="giac")
```

```
[Out] 1/4*sqrt(c*x^2 + b*x + a)*(2*f*x/c - (3*b*f - 4*c*e)/c^2) - 1/8*(  
8*c^2*d + 3*b^2*f - 4*a*c*f - 4*b*c*e)*ln(abs(-2*(sqrt(c)*x - sqr  
t(c*x^2 + b*x + a))*sqrt(c) - b))/c^(5/2)
```

$$3.112 \quad \int \frac{1}{\sqrt{a+bx+cx^2}(d+ex+fx^2)} dx$$

Optimal. Leaf size=374

$$\frac{\sqrt{2}f \tanh^{-1}\left(\frac{4af+2x(bf-c(\sqrt{e^2-4df}+e))-b(\sqrt{e^2-4df}+e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}} - \frac{\sqrt{2}f \tanh^{-1}\left(\frac{4af+2x(bf-c(e-\sqrt{e^2-4df}))-b(e-\sqrt{e^2-4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

[Out] -((Sqrt[2]*f*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f])) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])))/(Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + (Sqrt[2]*f*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f])) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])))/(Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])

Rubi [A] time = 1.3687, antiderivative size = 374, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.111$

$$\frac{\sqrt{2}f \tanh^{-1}\left(\frac{4af+2x(bf-c(\sqrt{e^2-4df}+e))-b(\sqrt{e^2-4df}+e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}} - \frac{\sqrt{2}f \tanh^{-1}\left(\frac{4af+2x(bf-c(e-\sqrt{e^2-4df}))-b(e-\sqrt{e^2-4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)), x]

[Out] -((Sqrt[2]*f*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f])) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x]/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x +

$$\frac{c^2 x^2)}{(\sqrt{e^2 - 4df} \sqrt{c^2 e^2 - 2cd^2 f - b^2 e^2 f + 2a^2 f^2 - (c^2 e - b^2 f) \sqrt{e^2 - 4df}})} + (\sqrt{2} f \operatorname{ArcTanh}[(4a^2 f - b^2(e + \sqrt{e^2 - 4df})) + 2(b^2 f - c^2(e + \sqrt{e^2 - 4df}))] x) / (2 \sqrt{2} \sqrt{c^2 e^2 - 2cd^2 f - b^2 e^2 f + 2a^2 f^2 + (c^2 e - b^2 f) \sqrt{e^2 - 4df}}) \sqrt{a + b^2 x + c^2 x^2}) / (\sqrt{e^2 - 4df} \sqrt{c^2 e^2 - 2cd^2 f - b^2 e^2 f + 2a^2 f^2 + (c^2 e - b^2 f) \sqrt{e^2 - 4df}})$$

Rubi in Sympy [A] time = 103.052, size = 357, normalized size = 0.95

$$\frac{\sqrt{2} f \operatorname{atanh}\left(\frac{\sqrt{2}(4af - be + b\sqrt{-4df + e^2} + x(2bf - 2ce + 2c\sqrt{-4df + e^2}))}{4\sqrt{a + bx + cx^2}\sqrt{2af^2 - bef - 2cdf + ce^2 + (bf - ce)\sqrt{-4df + e^2}}}\right)}{\sqrt{-4df + e^2}\sqrt{2af^2 - bef - 2cdf + ce^2 + (bf - ce)\sqrt{-4df + e^2}}} + \frac{\sqrt{2} f \operatorname{atanh}\left(\frac{\sqrt{2}(4af - b(e + \sqrt{-4df + e^2}) + x(2bf - 2c(e + \sqrt{-4df + e^2})))}{4\sqrt{a + bx + cx^2}\sqrt{2af^2 - bef - 2cdf + ce^2 - (bf - ce)\sqrt{-4df + e^2}}}\right)}{\sqrt{-4df + e^2}\sqrt{2af^2 - bef - 2cdf + ce^2 - (bf - ce)\sqrt{-4df + e^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d), x)`

[Out] $-\sqrt{2} f \operatorname{atanh}(\sqrt{2}(4a^2 f - b^2 e + b^2 \sqrt{-4df + e^2}) + x^2(2b^2 f - 2c^2 e + 2c^2 \sqrt{-4df + e^2})) / (4 \sqrt{2} \sqrt{a + b^2 x + c^2 x^2} \sqrt{2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + c^2 e^2 + (b^2 f - c^2 e) \sqrt{-4df + e^2}}) / (\sqrt{-4df + e^2} \sqrt{2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + c^2 e^2 + (b^2 f - c^2 e) \sqrt{-4df + e^2}}) + \sqrt{2} f \operatorname{atanh}(\sqrt{2}(4a^2 f - b^2(e + \sqrt{-4df + e^2})) + x^2(2b^2 f - 2c^2(e + \sqrt{-4df + e^2}))) / (4 \sqrt{2} \sqrt{a + b^2 x + c^2 x^2} \sqrt{2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + c^2 e^2 - (b^2 f - c^2 e) \sqrt{-4df + e^2}}) / (\sqrt{-4df + e^2} \sqrt{2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + c^2 e^2 - (b^2 f - c^2 e) \sqrt{-4df + e^2}})$

Mathematica [A] time = 5.14594, size = 633, normalized size = 1.69

$$\sqrt{2} f \left(\frac{\log(\sqrt{e^2 - 4df} - e - 2fx)}{\sqrt{f(2af + b\sqrt{e^2 - 4df} + b(-e)) + c(-e\sqrt{e^2 - 4df} - 2df + e^2)}} - \frac{\log(\sqrt{e^2 - 4df} + e + 2fx)}{\sqrt{f(2af - b(\sqrt{e^2 - 4df} + e)) + c(e\sqrt{e^2 - 4df} - 2df + e^2)}} - \frac{\log(2\sqrt{2}\sqrt{e^2 - 4df}\sqrt{a + x(b + cx)})}{\sqrt{f(2af - b(\sqrt{e^2 - 4df} + e)) + c(e\sqrt{e^2 - 4df} - 2df + e^2)}} \right)$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)),x]

[Out] (Sqrt[2]*f*(Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x]/Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]) - Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x]/Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]) - Log[4*a*f*Sqrt[e^2 - 4*d*f] + 2*c*e^2*x - 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + b*(e^2 - 4*d*f - e*Sqrt[e^2 - 4*d*f] + 2*f*Sqrt[e^2 - 4*d*f]*x) + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]) * Sqrt[a + x*(b + c*x)]/Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]) + Log[4*a*f*Sqrt[e^2 - 4*d*f] - 2*c*e^2*x + 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]) * Sqrt[a + x*(b + c*x)] - b*(e^2 + e*Sqrt[e^2 - 4*d*f] - 2*f*(2*d + Sqrt[e^2 - 4*d*f]*x))]/Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))])]/Sqrt[e^2 - 4*d*f]

Maple [B] time = 0.037, size = 761, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d),x)

[Out]
$$-1/(-4*d*f+e^2)^{(1/2)} * 2^{(1/2)} / (((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2)^{(1/2)} * \ln(\frac{((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2 + (c*(-4*d*f+e^2)^{(1/2)} + b*f - c*e) / f * (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)})) / f + 1/2 * 2^{(1/2)} * (((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2)^{(1/2)} * (4 * (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)})) / f)^2 * c + 4 * (c*(-4*d*f+e^2)^{(1/2)} + b*f - c*e) / f * (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)})) / f + 2 * ((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2)^{(1/2)} / (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)})) / f) + 1 / (-4*d*f+e^2)^{(1/2)} * 2^{(1/2)} / (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2)^{(1/2)} * \ln(\frac{((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2 + 1 / f * (-c * (-4*d*f+e^2)^{(1/2)} + b*f - c*e) * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)})) / f + 1/2 * 2^{(1/2)} * (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2)^{(1/2)} * (4 * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)})) / f)^2 * c + 4 / f * (-c * (-4*d*f+e^2)^{(1/2)} + b*f - c*e) * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)})) / f + 2 * ((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c*e + 2*a*f^2 - b*e*f - 2*c*d*f + e^2*c) / f^2)^{(1/2)} / (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)})) / f)$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 6.72084, size = 15237, normalized size = 40.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)),x, algorithm="fricas")

[Out]
$$\frac{1}{4} \sqrt{2} \sqrt{(c^2 e^2 + 2 a^2 f^2 - (2 c^2 d + b^2 e) f + (c^2 d^2 e^2 - b^2 c^2 d e^3 + a^2 c^2 e^4 - 4 a^2 d^2 f^3 + (4 a^2 b^2 d e + a^2 e^2 - 4 (b^2 - 2 a^2 c) d^2) f^2 - (4 c^2 d^3 - 4 b^2 c^2 d^2 e + a^2 b^2 e^3 - (b^2 - 6 a^2 c) d^2) f) \sqrt{(c^2 e^2 - 2 b^2 c^2 e f + b^2 f^2) / (c^4 d^4 e^2 - 2 b^2 c^3 d^3 e^3 - 2 a^2 b^2 c^2 d^2 e^5 + a^2 c^2 e^6 - 4 a^4 d^2 f^5 + (b^2 c^2 + 2 a^2 c^3) d^2 e^4 + (8 a^3 b^2 d e + a^4 e^2 - 8 (a^2 b^2 - 2 a^3 c) d^2) f^4 - 2 (a^3 b^2 e^3 + 2 (b^4 - 4 a^2 b^2 c + 6 a^2 c^2) d^3 - 4 (a^2 b^3 - a^2 b^2 c) d^2 e + (a^2 b^2 + 6 a^3 c) d^2 e^2) f^3 - (8 (b^2 c^2 - 2 a^2 c^3) d^4 - 8 (b^3 c - a^2 b^2) d^3 e - (b^4 - 20 a^2 b^2 c + 22 a^2 c^2) d^2 e^2 + 2 (a^2 b^3 - 5 a^2 b^2 c) d^2 e^3 - (a^2 b^2 + 2 a^3 c) e^4) f^2 - 2 (2 c^4 d^5 - 4 b^2 c^3 d^4 e + a^2 b^2 c^2 e^5 + (b^2 c^2 + 6 a^2 c^3) d^3 e^2 + (b^3 c - 5 a^2 b^2 c) d^2 e^3 - 2 (a^2 b^2 c - 2 a^2 c^2) d^2 e^4) f) / (c^2 d^2 e^2 - b^2 c^2 d e^3 + a^2 c^2 e^4 - 4 a^2 d^2 f^3 + (4 a^2 b^2 d e + a^2 e^2 - 4 (b^2 - 2 a^2 c) d^2) f^2 - (4 c^2 d^3 - 4 b^2 c^2 d^2 e + a^2 b^2 e^3 - (b^2 - 6 a^2 c) d^2) f) \log((2 (b^2 d - a^2 b^2 e) f^2 + \sqrt{2} (c^2 d^2 e^3 - 4 a^2 b^2 d^2 f^3 + (4 b^2 c^2 d^2 + 4 a^2 c^2 d^2 e + a^2 b^2 e^2) f^2 - (4 c^2 d^2 e + b^2 c^2 d^2 e + a^2 c^2 e^3) f - (c^3 d^3 e^3 - b^2 c^2 d^2 e^4 + a^2 c^2 d^2 e^5 + 4 (2 a^2 b^2 d^2 - a^3 d^2 e) f^4 + (2 a^2 b^2 d^2 e^2 + a^3 e^3 + 8 (b^3 - 2 a^2 b^2 c) d^3 - 4 (3 a^2 b^2 - a^2 c) d^2 e) f^3 + (8 b^2 c^2 d^4 - a^2 b^2 e^4 - 4 (3 b^2 c - a^2 c^2) d^3 e - 2 (b^3 - 10 a^2 b^2 c) d^2 e^2 + (3 a^2 b^2 - 5 a^2 c) d^2 e^3) f^2 - (4 c^3 d^4 e - 2 b^2 c^2 d^3 e^2 + 4 a^2 b^2 c^2 d^2 e^4 - a^2 c^2 e^5 - (3 b^2 c - 5 a^2 c^2) d^2 e^3) f) \sqrt{(c^2 e^2 - 2 b^2 c^2 e f + b^2 f^2) / (c^4 d^4 e^2 - 2 b^2 c^3 d^3 e^3 - 2 a^2 b^2 c^2 d^2 e^5 + a^2 c^2 e^6 - 4 a^4 d^2 f^5 + (b^2 c^2 + 2 a^2 c^3) d^2 e^4 + (8 a^3 b^2 d e + a^4 e^2 - 8 (a^2 b^2 - 2 a^3 c) d^2) f^4 - 2 (a^3 b^2 e^3 + 2 (b^4 - 4 a^2 b^2 c + 6 a^2 c^2) d^3 - 4 (a^2 b^3 - a^2 b^2 c) d^2 e + (a^2 b^2 + 6 a^3 c) d^2 e^2) f^3 - (8 (b^2 c^2 - 2 a^2 c^3) d^4 - 8 (b^3 c - a^2 b^2) d^3 e$$

$$\begin{aligned}
& - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c) \\
& *d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d \\
& ^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b \\
& *c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))*sqrt(c*x^2 + \\
& b*x + a)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f + (c^2*d^2*e^2 - \\
& b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 \\
& - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - \\
& 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e \\
& ^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 \\
& + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2 \\
& *b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6* \\
& a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d* \\
& e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e \\
& - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c) \\
& *d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d \\
& ^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b \\
& *c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/(c^2*d^2*e^2 \\
& - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 \\
& - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 \\
& - 6*a*c)*d*e^2)*f) - 2*(b*c*d*e - a*c*e^2)*f + ((4*b*c*d - b^2*e) \\
&)*f^2 - (4*c^2*d*e - b*c*e^2)*f)*x - (8*a^3*d*f^4 - 2*(4*a^2*b*d* \\
& e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)*d^2)*f^3 + 2*(4*a*c^2*d^3 - 4*a \\
& *b*c*d^2*e + a^2*b*e^3 - (a*b^2 - 6*a^2*c)*d*e^2)*f^2 - 2*(a*c^2* \\
& d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4)*f + (4*a^2*b*d*f^4 - (4*a*b^2* \\
& d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b*c)*d^2)*f^3 + (4*b*c^2*d^3 - 4*b \\
& ^2*c*d^2*e + a*b^2*e^3 - (b^3 - 6*a*b*c)*d*e^2)*f^2 - (b*c^2*d^2* \\
& e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f)*x)*sqrt((c^2*e^2 - 2*b*c*e*f + \\
& b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c \\
& ^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4 \\
& *e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - \\
& 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2 \\
& *b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3 \\
& *c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2 \\
& *(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2* \\
& c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 \\
& + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)* \\
& f)))/x) - 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f + \\
& (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a \\
& ^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a* \\
& b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2) \\
& ^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 \\
& - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4 \\
& *e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - \\
& 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 \\
& + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - \\
& a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b \\
& ^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d \\
& ^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + \\
& (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)) \\
& /((c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + \\
& a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a \\
& *b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*log((2*(b^2*d - a*b*e)*f^2 - sq \\
& rt(2)*(c^2*d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2 + 4*a*c*d*e + a*b*e^2) \\
&)*f^2 - (4*c^2*d^2*e + b*c*d*e^2 + a*c*e^3)*f - (c^3*d^3*e^3 - b*
\end{aligned}$$

$$\begin{aligned}
& c^2*d^2*e^4 + a*c^2*d*e^5 + 4*(2*a^2*b*d^2 - a^3*d*e)*f^4 + (2*a^2*b*d*e^2 + a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3 - 4*(3*a*b^2 - a^2*c)*d^2*e)*f^3 + (8*b*c^2*d^4 - a^2*b*e^4 - 4*(3*b^2*c - a*c^2)*d^3*e - 2*(b^3 - 10*a*b*c)*d^2*e^2 + (3*a*b^2 - 5*a^2*c)*d*e^3)*f^2 - (4*c^3*d^4*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d*e^4 - a^2*c*e^5 - (3*b^2*c - 5*a*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))*sqrt(c*x^2 + b*x + a)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f + (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)) - 2*(b*c*d*e - a*c*e^2)*f + ((4*b*c*d - b^2*e)*f^2 - (4*c^2*d*e - b*c*e^2)*f)*x - (8*a^3*d*f^4 - 2*(4*a^2*b*d*e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)*d^2)*f^3 + 2*(4*a*c^2*d^3 - 4*a*b*c*d^2*e + a^2*b*e^3 - (a*b^2 - 6*a^2*c)*d*e^2)*f^2 - 2*(a*c^2*d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4)*f + (4*a^2*b*d*f^4 - (4*a*b^2*d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b*c)*d^2)*f^3 + (4*b*c^2*d^3 - 4*b^2*c*d^2*e + a*b^2*e^3 - (b^3 - 6*a*b*c)*d*e^2)*f^2 - (b*c^2*d^2*e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f)*x)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/x) + 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/x)
\end{aligned}$$

$$\begin{aligned}
& + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e \\
& + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - \\
& 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e \\
& ^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - \\
& 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3) \\
& *d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)* \\
& d*e^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4 \\
& *a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b* \\
& c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*log((2*(b^2*d - a*b* \\
& e)*f^2 + sqrt(2)*(c^2*d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2 + 4*a*c*d* \\
& e + a*b*e^2)*f^2 - (4*c^2*d^2*e + b*c*d*e^2 + a*c*e^3)*f + (c^3*d \\
& ^3*e^3 - b*c^2*d^2*e^4 + a*c^2*d*e^5 + 4*(2*a^2*b*d^2 - a^3*d*e)* \\
& f^4 + (2*a^2*b*d*e^2 + a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3 - 4*(3*a*b \\
& ^2 - a^2*c)*d^2*e)*f^3 + (8*b*c^2*d^4 - a^2*b*e^4 - 4*(3*b^2*c - \\
& a*c^2)*d^3*e - 2*(b^3 - 10*a*b*c)*d^2*e^2 + (3*a*b^2 - 5*a^2*c)*d \\
& *e^3)*f^2 - (4*c^3*d^4*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d*e^4 - a^2* \\
& c*e^5 - (3*b^2*c - 5*a*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2 - 2*b*c*e*f \\
& + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d^2*e^5 + a^ \\
& 2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b* \\
& d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2 \\
& *(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + \\
& (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(\\
& b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 \\
& + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2* \\
& (2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^ \\
& 3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e \\
& ^4)*f)))*sqrt(c*x^2 + b*x + a)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b \\
& *e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b \\
& *d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^ \\
& 2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f \\
& + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d^2*e^5 + a^ \\
& 2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b* \\
& d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2 \\
& *(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + \\
& (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(\\
& b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 \\
& + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2* \\
& (2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^ \\
& 3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e \\
& ^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a* \\
& b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d \\
& ^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f) - 2*(b*c*d*e - a*c*e^2) \\
& *f + ((4*b*c*d - b^2*e)*f^2 - (4*c^2*d*e - b*c*e^2)*f)*x + (8*a^3 \\
& *d*f^4 - 2*(4*a^2*b*d*e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)*d^2)*f^3 \\
& + 2*(4*a*c^2*d^3 - 4*a*b*c*d^2*e + a^2*b*e^3 - (a*b^2 - 6*a^2*c)* \\
& d*e^2)*f^2 - 2*(a*c^2*d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4)*f + (4*a \\
& ^2*b*d*f^4 - (4*a*b^2*d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b*c)*d^2)*f^ \\
& 3 + (4*b*c^2*d^3 - 4*b^2*c*d^2*e + a*b^2*e^3 - (b^3 - 6*a*b*c)*d* \\
& e^2)*f^2 - (b*c^2*d^2*e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f)*x)*sqrt((\\
& c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2 \\
& *a*b*c^2*d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)* \\
& d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 \\
& - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 \\
& - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 -
\end{aligned}$$

$$\begin{aligned}
& 2*a*c^3*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 2 \\
& 2*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a \\
& ^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^ \\
& 2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2 \\
& *c - 2*a^2*c^2)*d*e^4)*f))/x) - 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^ \\
& 2 - (2*c*d + b*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2* \\
& d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2* \\
& d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e \\
& ^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b* \\
& c^2*d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e \\
& ^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2* \\
& (a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2* \\
& *b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a* \\
& c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2 \\
& *c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c) \\
& *e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 \\
& + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - \\
& 2*a^2*c^2)*d*e^4)*f))/((c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2 \\
& *d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2 \\
& *d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f))*log((2*(b \\
& ^2*d - a*b*e)*f^2 - sqrt(2)*(c^2*d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2 \\
& + 4*a*c*d*e + a*b*e^2)*f^2 - (4*c^2*d^2*e + b*c*d*e^2 + a*c*e^3) \\
& *f + (c^3*d^3*e^3 - b*c^2*d^2*e^4 + a*c^2*d^2*e^5 + 4*(2*a^2*b*d^2 \\
& - a^3*d^2*e)*f^4 + (2*a^2*b*d^2*e^2 + a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3 \\
& - 4*(3*a*b^2 - a^2*c)*d^2*e)*f^3 + (8*b*c^2*d^4 - a^2*b^2*e^4 - 4* \\
& (3*b^2*c - a*c^2)*d^3*e - 2*(b^3 - 10*a*b*c)*d^2*e^2 + (3*a*b^2 - \\
& 5*a^2*c)*d^2*e^3)*f^2 - (4*c^3*d^4*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d \\
& *e^4 - a^2*c^2*e^5 - (3*b^2*c - 5*a*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2 \\
& - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2 \\
& *d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 \\
& + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^ \\
& 3*b^2*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b* \\
& c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3) \\
&)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^ \\
& 2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^ \\
& 4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + \\
& 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a \\
& ^2*c^2)*d*e^4)*f))/sqrt(c*x^2 + b*x + a)*sqrt((c*e^2 + 2*a*f^2 - \\
& (2*c*d + b*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f \\
& ^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 \\
& - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 \\
& - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2 \\
& *d^2*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 \\
& + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^ \\
& 3*b^2*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b* \\
& c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3) \\
&)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^ \\
& 2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^ \\
& 4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + \\
& 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a \\
& ^2*c^2)*d*e^4)*f))/((c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d* \\
& f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 \\
& - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)) - 2*(b*c*d*e \\
& - a*c*e^2)*f + ((4*b*c*d - b^2*e)*f^2 - (4*c^2*d^2*e - b*c*e^2)*f)
\end{aligned}$$

```
*x + (8*a^3*d*f^4 - 2*(4*a^2*b*d*e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)
)*d^2)*f^3 + 2*(4*a*c^2*d^3 - 4*a*b*c*d^2*e + a^2*b*e^3 - (a*b^2
- 6*a^2*c)*d*e^2)*f^2 - 2*(a*c^2*d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4
4)*f + (4*a^2*b*d*f^4 - (4*a*b^2*d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b
*c)*d^2)*f^3 + (4*b*c^2*d^3 - 4*b^2*c*d^2*e + a*b^2*e^3 - (b^3 -
6*a*b*c)*d*e^2)*f^2 - (b*c^2*d^2*e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f
)*x)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*
d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2
+ 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*
c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3
- 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8
*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*
a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^
2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*
c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3
- 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/x)
```

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

$$\int \frac{1}{\sqrt{a + bx + cx^2}(d + ex + fx^2)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d), x)

[Out] Integral(1/(sqrt(a + b*x + c*x**2)*(d + e*x + f*x**2)), x)

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)),x, algorithm="giac")

[Out] Exception raised: RuntimeError

$$3.113 \quad \int \frac{1}{\sqrt{a+bx+cx^2}(d+ex+fx^2)^2} dx$$

Optimal. Leaf size=789

$$\frac{\left(f\left(e - \sqrt{e^2 - 4df}\right)(ce - bf)(2af - be + 2cd) - 2f\left(f\left(-4a^2f^2 + 3abef + b^2(e^2 - 6df)\right) - c(4af(e^2 - 3df) + b(e^3 - 3def))\right)\right)}{2\sqrt{2}(e^2 - 4df)^{3/2}((cd - af)^2 - (bd - ae)(ce - bf))\sqrt{2af^2 - \sqrt{e^2 - 4df}}}$$

$$\frac{\left(f\left(\sqrt{e^2 - 4df} + e\right)(ce - bf)(2af - be + 2cd) - 2f\left(f\left(-4a^2f^2 + 3abef + b^2(e^2 - 6df)\right) - c(4af(e^2 - 3df) + b(e^3 - 3def))\right)\right)}{2\sqrt{2}(e^2 - 4df)^{3/2}((cd - af)^2 - (bd - ae)(ce - bf))\sqrt{2af^2 + \sqrt{e^2 - 4df}}}$$

$$+ \frac{\sqrt{a+bx+cx^2}\left(fx\left(f(be - 2af) - c(e^2 - 2df)\right) + f(-aef - 2bdf + be^2) - c(e^3 - 3def)\right)}{(e^2 - 4df)(d + ex + fx^2)((cd - af)^2 - (bd - ae)(ce - bf))}$$

[Out] ((f*(b*e^2 - 2*b*d*f - a*e*f) - c*(e^3 - 3*d*e*f) + f*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f))*x)*Sqrt[a + b*x + c*x^2])/((e^2 - 4*d*f) * ((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*(d + e*x + f*x^2)) + ((f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e - Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(3*a*b*e*f - 4*a^2*f^2 + b^2*(e^2 - 6*d*f)) - c*(4*a*f*(e^2 - 3*d*f) + b*(e^3 - 5*d*e*f))))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]/(2*Sqrt[2]*(e^2 - 4*d*f)^(3/2)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) - ((f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(3*a*b*e*f - 4*a^2*f^2 + b^2*(e^2 - 6*d*f)) - c*(4*a*f*(e^2 - 3*d*f) + b*(e^3 - 5*d*e*f))))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]/(2*Sqrt[2]*(e^2 - 4*d*f)^(3/2)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])

Rubi [A] time = 16.7037, antiderivative size = 787, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{\left(f\left(e - \sqrt{e^2 - 4df}\right)(ce - bf)(2af - be + 2cd) - 2f(-4a^2f^3 + 3abef^2 - 4acf(e^2 - 3df) + b^2f(e^2 - 6df) - bc(e^3 - 5d^2))\right)}{2\sqrt{2}(e^2 - 4df)^{3/2}((cd - af)^2 - (bd - ae)(ce - bf))\sqrt{2af^2 - \sqrt{e^2 - 4df}}}$$

$$\frac{\left(f\left(\sqrt{e^2 - 4df} + e\right)(ce - bf)(2af - be + 2cd) - 2f(-4a^2f^3 + 3abef^2 - 4acf(e^2 - 3df) + b^2f(e^2 - 6df) - bc(e^3 - 5d^2))\right)}{2\sqrt{2}(e^2 - 4df)^{3/2}((cd - af)^2 - (bd - ae)(ce - bf))\sqrt{2af^2 + \sqrt{e^2 - 4df}}}$$

$$+ \frac{\sqrt{a + bx + cx^2}(fx(f(be - 2af) - c(e^2 - 2df)) + f(-aef - 2bdf + be^2) - c(e^3 - 3def))}{(e^2 - 4df)(d + ex + fx^2)((cd - af)^2 - (bd - ae)(ce - bf))}$$

Warning: Unable to verify antiderivative.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)^2), x]

[Out] $((f*(b*e^2 - 2*b*d*f - a*e*f) - c*(e^3 - 3*d*e*f) + f*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f))*x)*\text{Sqrt}[a + b*x + c*x^2])/((e^2 - 4*d*f) * ((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*(d + e*x + f*x^2)) + ((f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e - \text{Sqrt}[e^2 - 4*d*f]) - 2*f*(3*a*b*e*f^2 - 4*a^2*f^3 + b^2*f*(e^2 - 6*d*f) + 2*c^2*d*(e^2 - 4*d*f) - 4*a*c*f*(e^2 - 3*d*f) - b*c*(e^3 - 5*d*e*f)))*\text{ArcTanh}[(4*a*f - b*(e - \text{Sqrt}[e^2 - 4*d*f]) + 2*(b*f - c*(e - \text{Sqrt}[e^2 - 4*d*f])))*x]/(2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]*\text{Sqrt}[a + b*x + c*x^2]))/(2*\text{Sqrt}[2]*(e^2 - 4*d*f)^{(3/2)}*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]) - ((f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + \text{Sqrt}[e^2 - 4*d*f]) - 2*f*(3*a*b*e*f^2 - 4*a^2*f^3 + b^2*f*(e^2 - 6*d*f) + 2*c^2*d*(e^2 - 4*d*f) - 4*a*c*f*(e^2 - 3*d*f) - b*c*(e^3 - 5*d*e*f)))*\text{ArcTanh}[(4*a*f - b*(e + \text{Sqrt}[e^2 - 4*d*f]) + 2*(b*f - c*(e + \text{Sqrt}[e^2 - 4*d*f])))*x]/(2*\text{Sqrt}[2]*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]]*\text{Sqrt}[a + b*x + c*x^2]))/(2*\text{Sqrt}[2]*(e^2 - 4*d*f)^{(3/2)}*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*\text{Sqrt}[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*\text{Sqrt}[e^2 - 4*d*f]])$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2, x)

[Out] Timed out

Mathematica [B] time = 6.67129, size = 1836, normalized size = 2.33

$$\frac{(-ce^3 + bfe^2 - cfxe^2 - af^2e + 3cdf e + bf^2xe - 2bdf^2 - 2af^3x + 2cdf^2x)(cx^2 + bx + a)}{(e^2 - 4df)(dfb^2 - cdeb - aefb + c^2d^2 + ace^2 + a^2f^2 - 2acdf)(fx^2 + ex + d)\sqrt{a + x(b + cx)}}$$

$$f\left(\frac{bce^3 - 2c^2de^2 - b^2fe^2 + 10acfe^2 + bc\sqrt{e^2 - 4dfe^2} - 8abf^2e - 12bcdfe - 2c^2d\sqrt{e^2 - 4dfe} - b^2f\sqrt{e^2 - 4dfe} - 2ac}{2\sqrt{2}(e^2 - 4df)^{3/2}(dfb^2 - cdeb - aefb + c^2d^2 + ace^2 + a^2f^2 - 2acdf)}\right)$$

$$f\left(\frac{-bce^3 + 2c^2de^2 + b^2fe^2 - 10acfe^2 + bc\sqrt{e^2 - 4dfe^2} + 8abf^2e + 12bcdfe - 2c^2d\sqrt{e^2 - 4dfe} - b^2f\sqrt{e^2 - 4dfe} - 2ac}{2\sqrt{2}(e^2 - 4df)^{3/2}(dfb^2 - cdeb - aefb + c^2d^2 + ace^2 + a^2f^2 - 2acdf)}\right)$$

$$f\left(\frac{-bce^3 + 2c^2de^2 + b^2fe^2 - 10acfe^2 + bc\sqrt{e^2 - 4dfe^2} + 8abf^2e + 12bcdfe - 2c^2d\sqrt{e^2 - 4dfe} - b^2f\sqrt{e^2 - 4dfe} - 2ac}{2\sqrt{2}(e^2 - 4df)^{3/2}(dfb^2 - cdeb - aefb + c^2d^2 + ace^2 + a^2f^2 - 2acdf)}\right)$$

$$f\left(\frac{bce^3 - 2c^2de^2 - b^2fe^2 + 10acfe^2 + bc\sqrt{e^2 - 4dfe^2} - 8abf^2e - 12bcdfe - 2c^2d\sqrt{e^2 - 4dfe} - b^2f\sqrt{e^2 - 4dfe} - 2ac}{2\sqrt{2}(e^2 - 4df)^{3/2}(dfb^2 - cdeb - aefb + c^2d^2 + ace^2 + a^2f^2 - 2acdf)}\right)$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)^2),x]

[Out] $((-(c^3e^3) + 3c^2d^2ef + b^2e^2f^2 - 2b^2d^2f^2 - a^2e^2f^2 - c^2e^2f^2x + 2c^2d^2f^2x + b^2e^2f^2x - 2a^2f^3x)(a + b^2x + c^2x^2))/((e^2 - 4d^2f)(c^2d^2 - b^2c^2d^2e + a^2c^2e^2 + b^2d^2f - 2a^2c^2d^2f - a^2b^2e^2f + a^2f^2)^2(d + e^2x + f^2x^2)\sqrt{a + x(b + c^2x)}) - (f^2(-2c^2d^2e^2 + b^2c^2e^3 + 16c^2d^2f^2 - 12b^2c^2d^2ef - b^2e^2f^2 + 10a^2c^2e^2f + 12b^2d^2f^2 - 24a^2c^2d^2f^2 - 8a^2b^2e^2f^2 + 8a^2f^3 - 2c^2d^2e^2\sqrt{e^2 - 4d^2f} + b^2c^2e^2\sqrt{e^2 - 4d^2f} + 2b^2c^2d^2f\sqrt{e^2 - 4d^2f} - b^2e^2f\sqrt{e^2 - 4d^2f} - 2a^2c^2e^2f\sqrt{e^2 - 4d^2f} + 2a^2b^2f^2\sqrt{e^2 - 4d^2f})\sqrt{a + b^2x + c^2x^2})\log[-e + \sqrt{e^2 - 4d^2f} - 2f^2x]/(2\sqrt{2}(e^2 - 4d^2f)^{3/2}(c^2d^2 - b^2c^2d^2e + a^2c^2e^2 + b^2d^2f - 2a^2c^2d^2f - a^2b^2e^2f + a^2f^2)^2\sqrt{c^2e^2 - 2c^2d^2f - b^2e^2f + 2a^2f^2 - c^2e^2\sqrt{e^2 - 4d^2f} + b^2f\sqrt{e^2 - 4d^2f}})\sqrt{a + x(b + c^2x)}) - (f^2(2c^2d^2e^2 - b^2c^2e^3 - 16c^2d^2f^2 + 12b^2c^2d^2ef + b^2e^2f^2 - 10a^2c^2e^2f - 12b^2d^2f^2 + 24a^2c^2d^2f^2 + 8a^2b^2e^2f^2 - 8a^2f^3 - 2c^2d^2e^2\sqrt{e^2 - 4d^2f} + b^2c^2e^2\sqrt{e^2 - 4d^2f} + 2b^2c^2d^2f\sqrt{e^2 - 4d^2f} - b^2e^2f\sqrt{e^2 - 4d^2f} - 2a^2c^2e^2f\sqrt{e^2 - 4d^2f} + 2a^2b^2f^2\sqrt{e^2 - 4d^2f})\sqrt{a + b^2x + c^2x^2})\log[e + \sqrt{e^2 - 4d^2f} + 2f^2x]/(2\sqrt{2}(e^2 - 4d^2f)^{3/2}(c^2d^2 - b^2c^2d^2e + a^2c^2e^2 + b^2d^2f - 2a^2c^2d^2f - a^2b^2e^2f + a^2f^2)^2\sqrt{c^2e^2 - 2c^2d^2f - b^2e^2f + 2a^2f^2 +$

$$\begin{aligned}
& c^*e^*\text{Sqrt}[e^2 - 4*d*f] - b*f^*\text{Sqrt}[e^2 - 4*d*f]]^*\text{Sqrt}[a + x*(b + c^* \\
& x))] + (f*(2^*c^2*d^*e^2 - b^*c^*e^3 - 16^*c^2*d^2*f + 12^*b^*c^*d^*e^*f + \\
& b^2^*e^2*f - 10^*a^*c^*e^2*f - 12^*b^2*d^*f^2 + 24^*a^*c^*d^*f^2 + 8^*a^*b^*e^* \\
& f^2 - 8^*a^2*f^3 - 2^*c^2*d^*e^*\text{Sqrt}[e^2 - 4*d*f] + b^*c^*e^2^*\text{Sqrt}[e^2 \\
& - 4*d*f] + 2^*b^*c^*d^*f^*\text{Sqrt}[e^2 - 4*d*f] - b^2^*e^*f^*\text{Sqrt}[e^2 - 4*d*f] \\
&] - 2^*a^*c^*e^*f^*\text{Sqrt}[e^2 - 4*d*f] + 2^*a^*b^*f^2^*\text{Sqrt}[e^2 - 4*d*f])^*\text{Sq} \\
& \text{rt}[a + b*x + c*x^2]^*\text{Log}[b^*e - 4^*a^*f + b^*\text{Sqrt}[e^2 - 4*d*f] + 2^*c^*e^* \\
& *x - 2^*b^*f^*x + 2^*c^*\text{Sqrt}[e^2 - 4*d*f]^*x - 2^*\text{Sqrt}[2]^*\text{Sqrt}[c^*e^2 - 2^* \\
& *c^*d^*f - b^*e^*f + 2^*a^*f^2 + c^*e^*\text{Sqrt}[e^2 - 4*d*f] - b^*f^*\text{Sqrt}[e^2 - \\
& 4*d*f]]^*\text{Sqrt}[a + b*x + c*x^2]])/(2^*\text{Sqrt}[2]^*(e^2 - 4*d*f)^(3/2)^*(\\
& c^2*d^2 - b^*c^*d^*e + a^*c^*e^2 + b^2*d^*f - 2^*a^*c^*d^*f - a^*b^*e^*f + a^2 \\
& *f^2)^*\text{Sqrt}[c^*e^2 - 2^*c^*d^*f - b^*e^*f + 2^*a^*f^2 + c^*e^*\text{Sqrt}[e^2 - 4*d \\
& *f] - b^*f^*\text{Sqrt}[e^2 - 4*d*f]]^*\text{Sqrt}[a + x*(b + c*x))] + (f*(-2^*c^2^* \\
& d^*e^2 + b^*c^*e^3 + 16^*c^2*d^2*f - 12^*b^*c^*d^*e^*f - b^2^*e^2*f + 10^*a^* \\
& c^*e^2*f + 12^*b^2*d^*f^2 - 24^*a^*c^*d^*f^2 - 8^*a^*b^*e^*f^2 + 8^*a^2*f^3 - \\
& 2^*c^2*d^*e^*\text{Sqrt}[e^2 - 4*d*f] + b^*c^*e^2^*\text{Sqrt}[e^2 - 4*d*f] + 2^*b^*c^* \\
& d^*f^*\text{Sqrt}[e^2 - 4*d*f] - b^2^*e^*f^*\text{Sqrt}[e^2 - 4*d*f] - 2^*a^*c^*e^*f^*\text{Sq} \\
& \text{rt}[e^2 - 4*d*f] + 2^*a^*b^*f^2^*\text{Sqrt}[e^2 - 4*d*f])^*\text{Sqrt}[a + b*x + c*x^2 \\
& 2]^*\text{Log}[-(b^*e) + 4^*a^*f + b^*\text{Sqrt}[e^2 - 4*d*f] - 2^*c^*e^*x + 2^*b^*f^*x + \\
& 2^*c^*\text{Sqrt}[e^2 - 4*d*f]^*x + 2^*\text{Sqrt}[2]^*\text{Sqrt}[c^*e^2 - 2^*c^*d^*f - b^*e^*f \\
& + 2^*a^*f^2 - c^*e^*\text{Sqrt}[e^2 - 4*d*f] + b^*f^*\text{Sqrt}[e^2 - 4*d*f]]^*\text{Sqrt}[\\
& a + b*x + c*x^2]])/(2^*\text{Sqrt}[2]^*(e^2 - 4*d*f)^(3/2)^*(c^2*d^2 - b^*c^* \\
& d^*e + a^*c^*e^2 + b^2*d^*f - 2^*a^*c^*d^*f - a^*b^*e^*f + a^2*f^2)^*\text{Sqrt}[c^*e^ \\
& ^2 - 2^*c^*d^*f - b^*e^*f + 2^*a^*f^2 - c^*e^*\text{Sqrt}[e^2 - 4*d*f] + b^*f^*\text{Sqrt} \\
& [e^2 - 4*d*f]]^*\text{Sqrt}[a + x*(b + c*x)])
\end{aligned}$$

Maple [B] time = 0.044, size = 3858, normalized size = 4.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] $2/(4*d*f-e^2)/((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c^*e+2^*a^* \\ f^2-b^*e^*f-2^*c^*d^*f+e^2*c)^*f^2/(x+1/2^*e/f-1/2^*(-4*d*f+e^2)^(1/2)/f) \\ *((x-1/2^*(-e+(-4*d*f+e^2)^(1/2))/f)^2*c+(c^*(-4*d*f+e^2)^(1/2)+b^*f \\ -c^*e)/f*(x-1/2^*(-e+(-4*d*f+e^2)^(1/2))/f)+1/2^*((-4*d*f+e^2)^(1/2) \\ *b*f-(-4*d*f+e^2)^(1/2)*c^*e+2^*a^*f^2-b^*e^*f-2^*c^*d^*f+e^2*c)/f^2)^(1/ \\ 2)-1/(4*d*f-e^2)^*f/((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c^*e \\ +2^*a^*f^2-b^*e^*f-2^*c^*d^*f+e^2*c)^2^(1/2)/(((4*d*f+e^2)^(1/2)*b*f-(- \\ 4*d*f+e^2)^(1/2)*c^*e+2^*a^*f^2-b^*e^*f-2^*c^*d^*f+e^2*c)/f^2)^(1/2)*\ln((\\ (-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c^*e+2^*a^*f^2-b^*e^*f-2^*c^* \\ d^*f+e^2*c)/f^2+(c^*(-4*d*f+e^2)^(1/2)+b^*f-c^*e)/f*(x-1/2^*(-e+(-4*d^* \\ f+e^2)^(1/2))/f)+1/2^2^(1/2)*(((4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2) \\)^(1/2)*c^*e+2^*a^*f^2-b^*e^*f-2^*c^*d^*f+e^2*c)/f^2)^(1/2)*(4^*(x-1/2^*(-e \\ +(-4*d*f+e^2)^(1/2))/f)^2*c+4^*(c^*(-4*d*f+e^2)^(1/2)+b^*f-c^*e)/f*(x \\ -1/2^*(-e+(-4*d*f+e^2)^(1/2))/f)+2^*((4*d*f+e^2)^(1/2)*b*f-(-4*d*f \\ +e^2)^(1/2)*c^*e+2^*a^*f^2-b^*e^*f-2^*c^*d^*f+e^2*c)/f^2)^(1/2))/(x-1/2^*($

$$\begin{aligned}
& -e+(-4*d*f+e^2)^{(1/2)}/f)) * c * (-4*d*f+e^2)^{(1/2)} - 1/(4*d*f-e^2) * f^2 \\
& /(((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c \\
& * d*f + e^2 * c) * 2^{(1/2)} / (((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c \\
& * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * \ln((((-4*d*f+e^2)^{(1/2)} \\
&) * b*f - (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2 + (c * \\
& (-4*d*f+e^2)^{(1/2)} + b*f - c * e) / f * (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)}) / f) + 1 \\
& / 2 * 2^{(1/2)} * (((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 \\
& - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * (4 * (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)} \\
&)) / f)^2 * c + 4 * (c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) / f * (x - 1/2 * (-e + (-4*d*f+e \\
& ^2)^{(1/2)}) / f) + 2 * (((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c * e + 2 \\
& * a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} / (x - 1/2 * (-e + (-4*d*f+e^2)^{(1 \\
& / 2)) / f) * b + 1 / (4*d*f - e^2) * f / (((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(\\
& 1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) * 2^{(1/2)} / (((-4*d*f+e^2)^{(1/2)} \\
&) * b*f - (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1 \\
& / 2)} * \ln((((-4*d*f+e^2)^{(1/2)} * b*f - (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b* \\
& e*f - 2*c * d*f + e^2 * c) / f^2 + (c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) / f * (x - 1/2 * (- \\
& e + (-4*d*f+e^2)^{(1/2)}) / f) + 1/2 * 2^{(1/2)} * (((-4*d*f+e^2)^{(1/2)} * b*f - (-4 \\
& * d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * (4 * (x \\
& - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)}) / f)^2 * c + 4 * (c * (-4*d*f+e^2)^{(1/2)} + b*f - c \\
& * e) / f * (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)}) / f) + 2 * (((-4*d*f+e^2)^{(1/2)} * b*f \\
& - (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} / \\
& (x - 1/2 * (-e + (-4*d*f+e^2)^{(1/2)}) / f)) * c * e + 2 / (4*d*f - e^2) / (-(-4*d*f+e^ \\
& 2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) * \\
& f^2 / (x + 1/2 * e / f + 1/2 * (-4*d*f+e^2)^{(1/2)} / f) * ((x + 1/2 * (e + (-4*d*f+e^2)^ \\
& (1/2)) / f)^2 * c + 1 / f * (-c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) * (x + 1/2 * (e + (-4*d \\
& * f+e^2)^{(1/2)}) / f) + 1/2 * (-(-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} \\
& * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} + 1 / (4*d*f - e^2) * f / (-(- \\
& 4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f \\
& + e^2 * c) * 2^{(1/2)} / (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + \\
& 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * \ln((((-4*d*f+e^2)^{(1/2)} * \\
& b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2 + 1 / f * (\\
& -c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)}) / f) + 1 \\
& / 2 * 2^{(1/2)} * (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f \\
& ^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * (4 * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)} \\
&)) / f)^2 * c + 4 / f * (-c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) * (x + 1/2 * (e + (-4*d*f+e \\
& ^2)^{(1/2)}) / f) + 2 * (-(-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2 \\
& * a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} / (x + 1/2 * (e + (-4*d*f+e^2)^{(1 \\
& / 2)) / f) * c * (-4*d*f+e^2)^{(1/2)} - 1 / (4*d*f - e^2) * f^2 / (-(-4*d*f+e^2)^{(1 \\
& / 2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) * 2^{(1/ \\
& 2)} / (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f \\
& - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * \ln((((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e \\
& ^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2 + 1 / f * (-c * (-4*d*f+e^ \\
& 2)^{(1/2)} + b*f - c * e) * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)}) / f) + 1/2 * 2^{(1/2)} * ((\\
& -(-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * \\
& d*f+e^2 * c) / f^2)^{(1/2)} * (4 * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)}) / f)^2 * c + 4 / f \\
& * (-c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) * (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)}) / f) \\
& + 2 * (-(-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - \\
& 2*c * d*f + e^2 * c) / f^2)^{(1/2)} / (x + 1/2 * (e + (-4*d*f+e^2)^{(1/2)}) / f)) * b + 1 / \\
& (4*d*f - e^2) * f / (-(-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a \\
& * f^2 - b*e*f - 2*c * d*f + e^2 * c) * 2^{(1/2)} / (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d \\
& * f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d*f + e^2 * c) / f^2)^{(1/2)} * \ln((((- \\
& 4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^2)^{(1/2)} * c * e + 2*a*f^2 - b*e*f - 2*c * d* \\
& f+e^2 * c) / f^2 + 1 / f * (-c * (-4*d*f+e^2)^{(1/2)} + b*f - c * e) * (x + 1/2 * (e + (-4*d \\
& * f+e^2)^{(1/2)}) / f) + 1/2 * 2^{(1/2)} * (((-4*d*f+e^2)^{(1/2)} * b*f + (-4*d*f+e^
\end{aligned}$$

$$2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2)} * (4 * (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f)^2 * c + 4 / f * (-c * (-4 * d * f + e^2)^{(1/2)} + b * f - c * e) * (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f) + 2 * (-(-4 * d * f + e^2)^{(1/2)} * b * f + (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2))} / (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f)) * c * e - 2 * f / (4 * d * f - e^2) / (-4 * d * f + e^2)^{(1/2)} * 2^2)^{(1/2)} / (((-4 * d * f + e^2)^{(1/2)} * b * f - (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2)} * \ln(((-4 * d * f + e^2)^{(1/2)} * b * f - (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2 + (c * (-4 * d * f + e^2)^{(1/2)} + b * f - c * e) / f * (x - 1/2 * (-e + (-4 * d * f + e^2)^{(1/2)) / f) + 1/2 * 2^2)^{(1/2)} * (((-4 * d * f + e^2)^{(1/2)} * b * f - (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2)} * (4 * (x - 1/2 * (-e + (-4 * d * f + e^2)^{(1/2)) / f)^2 * c + 4 * (c * (-4 * d * f + e^2)^{(1/2)} + b * f - c * e) / f * (x - 1/2 * (-e + (-4 * d * f + e^2)^{(1/2)) / f) + 2 * ((-4 * d * f + e^2)^{(1/2)} * b * f - (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2))} / (x - 1/2 * (-e + (-4 * d * f + e^2)^{(1/2)) / f) + 2 * f / (4 * d * f - e^2) / (-4 * d * f + e^2)^{(1/2)} * 2^2)^{(1/2)} / (((-4 * d * f + e^2)^{(1/2)} * b * f + (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2)} * \ln(((-4 * d * f + e^2)^{(1/2)} * b * f + (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2 + 1 / f * (-c * (-4 * d * f + e^2)^{(1/2)} + b * f - c * e) * (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f) + 1/2 * 2^2)^{(1/2)} * (((-4 * d * f + e^2)^{(1/2)} * b * f + (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2)} * (4 * (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f)^2 * c + 4 / f * (-c * (-4 * d * f + e^2)^{(1/2)} + b * f - c * e) * (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f) + 2 * (-(-4 * d * f + e^2)^{(1/2)} * b * f + (-4 * d * f + e^2)^{(1/2)} * c * e + 2 * a * f^2 - b * e * f - 2 * c * d * f + e^2 * c) / f^2)^{(1/2))} / (x + 1/2 * (e + (-4 * d * f + e^2)^{(1/2)) / f))$$

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(fx^2 + ex + d)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2), x, algorithm="maxima")

[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2), x)

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2), 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(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)`

[Out] Timed out

GIAC/XCAS [A] time = 0.738498, size = 4, normalized size = 0.01

sage₀x

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2),x, algorithm="giac")`

[Out] *sage₀x*

$$3.114 \quad \int \frac{(d+ex+fx^2)^3}{(a+bx+cx^2)^{3/2}} dx$$

Optimal. Leaf size=649

$$\begin{aligned} & 3 \tanh^{-1} \left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}} \right) (80c^2 f (a^2 f^2 + 6abef + 3b^2 (df + e^2)) - 280b^2 c f^2 (af + be) - 64c^3 (3af (df + e^2) + b (6def + e^3))) \\ & + \frac{2(-x(-2acf + b^2 f - bce + 2c^2 d) (a^2 c^2 f^2 - 4ab^2 c f^2 + 7abc^2 e f - 2ac^3 d f - 3ac^3 e^2 + b^4 f^2 - 2b^3 c e f + b^2 c^2 d f + b^2 c^2 e^2 - 128c^{11/2})}{\sqrt{a+bx+cx^2} (16c^2 f (20aef + 21b (df + e^2)) - 4bcf^2 (73af + 114be) + 187b^3 f^3 - 64c^3 (6def + e^3))} \\ & + \frac{fx\sqrt{a+bx+cx^2} (-4cf(7af + 22be) + 41b^2 f^2 + 48c^2 (df + e^2))}{32c^4} \\ & + \frac{f^2 x^2 \sqrt{a+bx+cx^2} (8ce - 5bf)}{8c^3} + \frac{f^3 x^3 \sqrt{a+bx+cx^2}}{4c^2} \end{aligned}$$

[Out] (2*(3*a*b^4*c*e*f^2 - a*b^5*f^3 + a*b^3*c*f*(5*a*f^2 - 3*c*(e^2 + d*f)) - b*c^2*(c^3*d^3 + 5*a^3*f^3 + 3*a*c^2*d*(e^2 + d*f) - 9*a^2*c*f*(e^2 + d*f)) - a*b^2*c^2*e*(12*a*f^2 - c*(e^2 + 6*d*f)) + 2*a*c^3*e*(3*c^2*d^2 + 3*a^2*f^2 - a*c*(e^2 + 6*d*f)) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*(c^4*d^2 - b*c^3*d*e + b^2*c^2*e^2 - 3*a*c^3*e^2 + b^2*c^2*d*f - 2*a*c^3*d*f - 2*b^3*c*e*f + 7*a*b*c^2*e*f + b^4*f^2 - 4*a*b^2*c*f^2 + a^2*c^2*f^2)*x)/(c^5*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) - ((187*b^3*f^3 - 4*b*c*f^2*(114*b*e + 73*a*f) - 64*c^3*(e^3 + 6*d*e*f) + 16*c^2*f*(20*a*e*f + 21*b*(e^2 + d*f)))*Sqrt[a + b*x + c*x^2])/(64*c^5) + (f*(41*b^2*f^2 - 4*c*f*(22*b*e + 7*a*f) + 48*c^2*(e^2 + d*f))*x*Sqrt[a + b*x + c*x^2])/(32*c^4) + (f^2*(8*c*e - 5*b*f)*x^2*Sqrt[a + b*x + c*x^2])/(8*c^3) + (f^3*x^3*Sqrt[a + b*x + c*x^2])/(4*c^2) + (3*(105*b^4*f^3 - 280*b^2*c*f^2*(b*e + a*f) + 128*c^4*d*(e^2 + d*f) + 80*c^2*f*(6*a*b*e*f + a^2*f^2 + 3*b^2*(e^2 + d*f)) - 64*c^3*(3*a*f*(e^2 + d*f) + b*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(128*c^(11/2))

Rubi [A] time = 4.14001, antiderivative size = 649, normalized size of antiderivative = 1., number of

steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\begin{aligned}
& 3 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) (80c^2 f (a^2 f^2 + 6abef + 3b^2 (df + e^2)) - 280b^2 cf^2 (af + be) - 64c^3 (3af (df + e^2) + b (6def + e^3))) \\
& + \frac{2(-x(-c(2af + be) + b^2 f + 2c^2 d) (c^2 (a^2 f^2 + 7abef + b^2 (df + e^2)) - 2b^2 cf(2af + be) - c^3 (2adf + 3ae^2 + bde) + b^4 f^2) + 128c^{11/2})}{64c^5} \\
& - \frac{\sqrt{a+bx+cx^2} (16c^2 f (20aef + 21b (df + e^2)) - 4bcf^2(73af + 114be) + 187b^3 f^3 - 64c^3 (6def + e^3))}{64c^5} \\
& + \frac{fx\sqrt{a+bx+cx^2} (-4cf(7af + 22be) + 41b^2 f^2 + 48c^2 (df + e^2))}{32c^4} \\
& + \frac{f^2 x^2 \sqrt{a+bx+cx^2} (8ce - 5bf)}{8c^3} + \frac{f^3 x^3 \sqrt{a+bx+cx^2}}{4c^2}
\end{aligned}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)^3/(a + b*x + c*x^2)^(3/2), x]

[Out] (2*(3*a*b^4*c*e*f^2 - a*b^5*f^3 + a*b^3*c*f*(5*a*f^2 - 3*c*(e^2 + d*f)) - b*c^2*(c^3*d^3 + 5*a^3*f^3 + 3*a*c^2*d*(e^2 + d*f) - 9*a^2*c*f*(e^2 + d*f)) - a*b^2*c^2*e*(12*a*f^2 - c*(e^2 + 6*d*f)) + 2*a*c^3*e*(3*c^2*d^2 + 3*a^2*f^2 - a*c*(e^2 + 6*d*f)) - (2*c^2*d + b^2*f - c*(b*e + 2*a*f))*(c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e + 2*a*f) - c^3*(b*d*e + 3*a*e^2 + 2*a*d*f) + c^2*(7*a*b*e*f + a^2*f^2 + b^2*(e^2 + d*f)))*x)/(c^5*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) - ((187*b^3*f^3 - 4*b*c*f^2*(114*b*e + 73*a*f) - 64*c^3*(e^3 + 6*d*e*f) + 16*c^2*f*(20*a*e*f + 21*b*(e^2 + d*f)))*Sqrt[a + b*x + c*x^2])/(64*c^5) + (f*(41*b^2*f^2 - 4*c*f*(22*b*e + 7*a*f) + 4*8*c^2*(e^2 + d*f))*x*Sqrt[a + b*x + c*x^2])/(32*c^4) + (f^2*(8*c*e - 5*b*f)*x^2*Sqrt[a + b*x + c*x^2])/(8*c^3) + (f^3*x^3*Sqrt[a + b*x + c*x^2])/(4*c^2) + (3*(105*b^4*f^3 - 280*b^2*c*f^2*(b*e + a*f) + 128*c^4*d*(e^2 + d*f) + 80*c^2*f*(6*a*b*e*f + a^2*f^2 + 3*b^2*(e^2 + d*f)) - 64*c^3*(3*a*f*(e^2 + d*f) + b*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(128*c^(11/2))

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(3/2), x)

[Out] Timed out

Mathematica [A] time = 4.23258, size = 745, normalized size = 1.15

$$3 \log \left(2\sqrt{c}\sqrt{a+x(b+cx)} + b + 2cx \right) (80c^2f(a^2f^2 + 6abef + 3b^2(df + e^2)) - 280b^2cf^2(af + be) - 64c^3(3af(df + e^2) +$$

$$\frac{-8b^3c(210a^2f^3 + acf(f(77fx^2 - 90d) - 90e^2 - 530efx) - c^2x(2ef(7fx^2 - 72d) + 3f^2x(10d + fx^2) - 24e^3 + 30e^2f$$

Antiderivative was successfully verified.

[In] Integrate[(d + e*x + f*x^2)^3/(a + b*x + c*x^2)^(3/2), x]

[Out] (315*b^6*f^3*x + 105*b^5*f^2*(3*a*f + c*x*(-8*e + f*x)) - 2*b^4*c*f*(105*a*f*(4*e + 9*f*x) + c*x*(-360*e^2 - 360*d*f + 140*e*f*x + 21*f^2*x^2)) - 8*b^3*c*(210*a^2*f^3 - c^2*x*(-24*e^3 + 30*e^2*f*x + 3*f^2*x^2*(10*d + f*x^2) + 2*e*f*(-72*d + 7*f*x^2)) + a*c*f*(-90*e^2 - 530*e*f*x + f*(-90*d + 77*f*x^2))) - 16*b^2*c^2*(-(a^2*f^2*(230*e + 169*f*x)) + a*c*(12*e^3 + 186*e^2*f*x + 2*e*f*(36*d - 43*f*x^2) + f^2*x*(186*d - 13*f*x^2)) + c^2*x*(-24*d^2*f + 6*d*(-4*e^2 + 4*e*f*x + f^2*x^2) + x*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3))) + 32*c^3*(8*c^3*d^3*x - a^3*f^2*(64*e + 15*f*x) + a^2*c*(16*e^3 + 36*e^2*f*x + f^2*x*(36*d - 5*f*x^2) - 32*e*f*(-3*d + f*x^2)) + 2*a*c^2*(-12*d^2*(e + f*x) + 6*d*x*(-2*e^2 + 4*e*f*x + f^2*x^2) + x^2*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3))) + 16*b*c^2*(113*a^3*f^3 + 8*c^3*d^2*(d - 3*e*x) + a^2*c*f*(-156*e^2 - 244*e*f*x + f*(-156*d + 49*f*x^2)) + 2*a*c^2*(12*d^2*f + 6*d*(2*e^2 + 20*e*f*x - 5*f^2*x^2) - x*(-20*e^3 + 30*e^2*f*x + 14*e*f^2*x^2 + 3*f^3*x^3)))/(64*c^5*(-b^2 + 4*a*c)*Sqrt[a + x*(b + c*x)]) + (3*(105*b^4*f^3 - 280*b^2*c*f^2*(b*e + a*f) + 128*c^4*d*(e^2 + d*f) + 80*c^2*f*(6*a*b*e*f + a^2*f^2 + 3*b^2*(e^2 + d*f)) - 64*c^3*(3*a*f*(e^2 + d*f) + b*(e^3 + 6*d*e*f)))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)]]/(128*c^(11/2))

Maple [B] time = 0.037, size = 2827, normalized size = 4.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x^2+e*x+d)^3/(c*x^2+b*x+a)^(3/2), x)

[Out] -105/32*e*f^2*b^6/c^5/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)+115/8*e*f^2*b^2/c^4*a/(c*x^2+b*x+a)^(1/2)+45/4*e*f^2*b/c^(7/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-4*e*f^2/c^2*a*x^2/(c*x^2+b*x+a)^(1/2)-7/4*e*f^2*b/c^2*x^3/(c*x^2+b*x+a)^(1/2)+35/8*e*f^2*b^2/c^3*

$$\begin{aligned}
& x^2/(c^*x^2+b^*x+a)^{(1/2)}+105/16^*e^*f^2*b^3/c^4*x/(c^*x^2+b^*x+a)^{(1/2)} \\
&)+3/2^*b^3/c^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*f^*d^2+3/2^*b^3/c^2/(\\
& 4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*e^2*d-45/8^*b^2/c^3*x/(c^*x^2+b^*x+a) \\
& ^{(1/2)}*d^*f^2-45/8^*b^2/c^3*x/(c^*x^2+b^*x+a)^{(1/2)}*e^2*f+45/16^*b^5/c \\
& ^4/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*d^*f^2+45/16^*b^5/c^4/(4^*a^*c-b^2) \\
&)/(c^*x^2+b^*x+a)^{(1/2)}*e^2*f-39/4^*b/c^3*a/(c^*x^2+b^*x+a)^{(1/2)}*d^*f^2 \\
& -39/4^*b/c^3*a/(c^*x^2+b^*x+a)^{(1/2)}*e^2*f+9/2/c^2*a*x/(c^*x^2+b^*x+a) \\
&)^{(1/2)}*d^*f^2+9/2/c^2*a*x/(c^*x^2+b^*x+a)^{(1/2)}*e^2*f-15/4^*b/c^2*x^2 \\
& /2/(c^*x^2+b^*x+a)^{(1/2)}*d^*f^2-15/4^*b/c^2*x^2/(c^*x^2+b^*x+a)^{(1/2)}*e^2 \\
& *f+2/c^2*a*b^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*e^3+12/c^2*a/(c^*x \\
& ^2+b^*x+a)^{(1/2)}*d^*e*f+6*x^2/c/(c^*x^2+b^*x+a)^{(1/2)}*d^*e*f-9/2^*b^2/c \\
& ^3/(c^*x^2+b^*x+a)^{(1/2)}*d^*e*f-3/2^*b^3/c^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a) \\
&)^{(1/2)}*x^*e^3-9^*b/c^{(5/2)}*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)}) \\
&)^2*d^*e*f+113/16^*f^3*b^3/c^4*a^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)} \\
& +315/128^*f^3*b^6/c^5/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x-6^*d^2*e^*b/ \\
& (4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x-3^*d^2*e^*b^2/c/(4^*a^*c-b^2)/(c^*x^2 \\
& +b^*x+a)^{(1/2)}+12/c^2*a*b^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*d^*e^*f \\
& +24/c^2*a*b/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x^*d^*e^*f+3/c^{(3/2)}*ln((1 \\
& /2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})^2*e^2*d+x^2/c/(c^*x^2+b^*x+a)^{(1/2)} \\
& *e^3-3/4^*b^2/c^3/(c^*x^2+b^*x+a)^{(1/2)}*e^3-3/2^*b/c^{(5/2)}*ln((1 \\
& /2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})^2*e^3+2/c^2*a/(c^*x^2+b^*x+a)^{(1/2)} \\
& *e^3+315/256^*f^3*b^5/c^6/(c^*x^2+b^*x+a)^{(1/2)}+1/4^*f^3*x^5/c/(c^*x^2+b^*x+a)^{(1/2)} \\
& +15/8^*f^3/c^{(7/2)}*a^2*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})+315/128^*f^3*b^4/c^{(11/2)} \\
& *ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})+2^*d^3*(2^*c^*x+b)/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)} \\
& -3^*d^2*e/c/(c^*x^2+b^*x+a)^{(1/2)}+3/c^{(3/2)}*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)}) \\
&)^2*f^*d^2-39/2^*b^2/c^2*a/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x^*e^2*f+115/4^*e^*f^2*b^3/c^3*a/(4^*a^*c-b^2) \\
&)/(c^*x^2+b^*x+a)^{(1/2)}*x-16^*e^*f^2/c^2*a^2*b/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x- \\
& 39/2^*b^2/c^2*a/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x^*d^*f^2-9^*b^3/c^2/(4^*a^*c-b^2) \\
&)/(c^*x^2+b^*x+a)^{(1/2)}*x^*d^*e^*f+3^*b^2/c/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x^*f^*d^2+3^*b^2/c \\
& /2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x^*e^2*d+9^*b/c^2*x/(c^*x^2+b^*x+a)^{(1/2)}*d^*e^*f-9/2^*b^4/c^3/(4^*a^*c-b^2) \\
&)/(c^*x^2+b^*x+a)^{(1/2)}*d^*e^*f+4/c^2*a*b/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)} \\
&)^2*x^*e^3+45/8^*b^4/c^3/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x^*d^*f^2+45/8^*b^4/c^3/(4^*a^*c-b^2) \\
&)/(c^*x^2+b^*x+a)^{(1/2)}*x^*e^2*f+113/8^*f^3*b^2/c^3*a^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x-105/8^*f^3*b^4/c^4*a/(4^*a^*c-b^2) \\
&)/(c^*x^2+b^*x+a)^{(1/2)}*x+115/8^*e^*f^2*b^4/c^4*a/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}-45/4^*e^*f^2*b/c^3*a*x/(c^*x^2+b^*x+a)^{(1/2)}-8^*e^*f^2 \\
& /c^3*a^2*b^2/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}-105/16^*e^*f^2*b^5/c^4/4/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*x-39/4^*b^3/c^3*a/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*d^*f^2-39/4^*b^3/c^3*a/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*e^2*f+45/8^*b^2/c^{(7/2)}*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})^2*d^*f^2+105/16^*f^3*b^2/c^4*a*x/(c^*x^2+b^*x+a)^{(1/2)}+49/16^*f^3*b^3/c^3*a*x^2/(c^*x^2+b^*x+a)^{(1/2)}+315/256^*f^3*b^7/c^6/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}-3/8^*f^3*b/c^2*x^4/(c^*x^2+b^*x+a)^{(1/2)}+e^*f^2*x^4/c/(c^*x^2+b^*x+a)^{(1/2)}-105/32^*e^*f^2*b^4/c^5/(c^*x^2+b^*x+a)^{(1/2)}-105/16^*e^*f^2*b^3/c^{(9/2)}*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})-8^*e^*f^2/c^3*a^2/(c^*x^2+b^*x+a)^{(1/2)}-3^*x/c/(c^*x^2+b^*x+a)^{(1/2)}*f^*d^2-3^*x/c/(c^*x^2+b^*x+a)^{(1/2)}*e^2*d+3/2^*b/c^2/(c^*x^2+b^*x+a)^{(1/2)}*f^*d^2+3/2^*b/c^2/(c^*x^2+b^*x+a)^{(1/2)}*e^2*d-9/2/c^{(5/2)}*a^*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})^2*d^*f^2-9/2/c^{(5/2)}*a^*ln((1/2^*b+c^*x)/c^{(1/2)}+(c^*x^2+b^*x+a)^{(1/2)})^2*e^2*f-3/4^*b^4/c^3/(4^*a^*c-b^2)/(c^*x^2+b^*x+a)^{(1/2)}*e^3+21/32^*f^3*b^2/c^3*x^3/(c^*x^2+b^*x+a)^{(1/2)}
\end{aligned}$$

$$\begin{aligned} & (1/2) - 105/16 * f^3 * b^2 / c^{(9/2)} * a * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) - 5/8 * f^3 / c^2 * a * x^3 / (c * x^2 + b * x + a)^{(1/2)} - 15/8 * f^3 / c^3 * a^2 * x / (c * x^2 + b * x + a)^{(1/2)} - 105/16 * f^3 * b^3 / c^5 * a / (c * x^2 + b * x + a)^{(1/2)} + 113/16 * f^3 * b / c^4 * a^2 / (c * x^2 + b * x + a)^{(1/2)} - 105/64 * f^3 * b^3 / c^4 * x^2 / (c * x^2 + b * x + a)^{(1/2)} - 315/128 * f^3 * b^4 / c^5 * x / (c * x^2 + b * x + a)^{(1/2)} + 45/16 * b^3 / c^4 / (c * x^2 + b * x + a)^{(1/2)} * e^2 * f - 105/16 * f^3 * b^5 / c^5 * a / (4 * a * c - b^2) / (c * x^2 + b * x + a)^{(1/2)} + 45/8 * b^2 / c^{(7/2)} * \ln((1/2 * b + c * x) / c^{(1/2)} + (c * x^2 + b * x + a)^{(1/2)}) * e^2 * f + 3/2 * x^3 / c / (c * x^2 + b * x + a)^{(1/2)} * e^2 * f + 45/16 * b^3 / c^4 / (c * x^2 + b * x + a)^{(1/2)} * d * f^2 + 3/2 * x^3 / c / (c * x^2 + b * x + a)^{(1/2)} * d * f^2 + 3/2 * b / c^2 * x / (c * x^2 + b * x + a)^{(1/2)} * e^3 \end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError

Fricas [A] time = 1.43661, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^3/(c*x^2 + b*x + a)^(3/2),x, algorithm="fricas")

[Out]
$$\begin{aligned} & [-1/256 * (4 * (128 * b * c^5 * d^3 - 768 * a * c^5 * d^2 * e + 384 * a * b * c^4 * d * e^2 - 16 * (b^2 * c^4 - 4 * a * c^5) * f^3 * x^5 - 8 * (8 * (b^2 * c^4 - 4 * a * c^5) * e * f^2 - 3 * (b^3 * c^3 - 4 * a * b * c^4) * f^3) * x^4 - 64 * (3 * a * b^2 * c^3 - 8 * a^2 * c^4) * e^3 + (315 * a * b^5 - 1680 * a^2 * b^3 * c + 1808 * a^3 * b * c^2) * f^3 - 2 * (48 * (b^2 * c^4 - 4 * a * c^5) * e^2 * f + (21 * b^4 * c^2 - 104 * a * b^2 * c^3 + 80 * a^2 * c^4) * f^3 + 8 * (6 * (b^2 * c^4 - 4 * a * c^5) * d - 7 * (b^3 * c^3 - 4 * a * b * c^4) * e) * f^2) * x^3 + 8 * (6 * (15 * a * b^3 * c^2 - 52 * a^2 * b * c^3) * d - (105 * a * b^4 * c - 460 * a^2 * b^2 * c^2 + 256 * a^3 * c^3) * e) * f^2 - (64 * (b^2 * c^4 - 4 * a * c^5) * e^3 - 7 * (15 * b^5 * c - 88 * a * b^3 * c^2 + 112 * a^2 * b * c^3) * f^3 - 8 * (30 * (b^3 * c^3 - 4 * a * b * c^4) * d - (35 * b^4 * c^2 - 172 * a * b^2 * c^3 + 128 * a^2 * c^4) * e) * f^2 + 48 * (8 * (b^2 * c^4 - 4 * a * c^5) * d * e - 5 * (b^3 * c^3 - 4 * a * b * c^4) * e^2) * f) * x^2 + 48 * (8 * a * b * c^4 * d^2 - 8 * (3 * a * b^2 * c^3 - 8 * a^2 * c^4) * d * e + (15 * a * b^3 * c^2 - 52 * a^2 * b * c^3) * e^2) * f + (256 * c^6 * d^3 - 384 * b * c^5 * d^2 * e + 384 * (b^2 * c^4 - 2 * a * c^5) * d * e^2 - 64 * (3 * b^3 * c^3 - 10 * a * b * c^4) * e^3 + (315 * b^6 - 1890 * a * b^4 * c + 2704 * a^2 * b^2 * c^2 - 480 * a^3 * c^3) * f^3 + 8 * (6 * (15 * b^4 * c^2 - 62 * a * b^2 * c^3 + 24 * a^2 * c^4) * d - (10 \end{aligned}$$

$$\begin{aligned}
& 5*b^5*c - 530*a*b^3*c^2 + 488*a^2*b*c^3)*e)*f^2 + 48*(8*(b^2*c^4 \\
& - 2*a*c^5)*d^2 - 8*(3*b^3*c^3 - 10*a*b*c^4)*d*e + (15*b^4*c^2 - 6 \\
& 2*a*b^2*c^3 + 24*a^2*c^4)*e^2)*f)*x)*\text{sqrt}(c*x^2 + b*x + a)*\text{sqrt}(c \\
&) - 3*(128*(a*b^2*c^4 - 4*a^2*c^5)*d*e^2 - 64*(a*b^3*c^3 - 4*a^2* \\
& b*c^4)*e^3 + 5*(21*a*b^6 - 140*a^2*b^4*c + 240*a^3*b^2*c^2 - 64*a \\
& ^4*c^3)*f^3 + 8*(6*(5*a*b^4*c^2 - 24*a^2*b^2*c^3 + 16*a^3*c^4)*d \\
& - 5*(7*a*b^5*c - 40*a^2*b^3*c^2 + 48*a^3*b*c^3)*e)*f^2 + (128*(b^ \\
& 2*c^5 - 4*a*c^6)*d*e^2 - 64*(b^3*c^4 - 4*a*b*c^5)*e^3 + 5*(21*b^6 \\
& *c - 140*a*b^4*c^2 + 240*a^2*b^2*c^3 - 64*a^3*c^4)*f^3 + 8*(6*(5* \\
& b^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c^5)*d - 5*(7*b^5*c^2 - 40*a*b^3* \\
& c^3 + 48*a^2*b*c^4)*e)*f^2 + 16*(8*(b^2*c^5 - 4*a*c^6)*d^2 - 24*(\\
& b^3*c^4 - 4*a*b*c^5)*d*e + 3*(5*b^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c \\
& ^5)*e^2)*f)*x^2 + 16*(8*(a*b^2*c^4 - 4*a^2*c^5)*d^2 - 24*(a*b^3*c \\
& ^3 - 4*a^2*b*c^4)*d*e + 3*(5*a*b^4*c^2 - 24*a^2*b^2*c^3 + 16*a^3* \\
& c^4)*e^2)*f + (128*(b^3*c^4 - 4*a*b*c^5)*d*e^2 - 64*(b^4*c^3 - 4* \\
& a*b^2*c^4)*e^3 + 5*(21*b^7 - 140*a*b^5*c + 240*a^2*b^3*c^2 - 64*a \\
& ^3*b*c^3)*f^3 + 8*(6*(5*b^5*c^2 - 24*a*b^3*c^3 + 16*a^2*b*c^4)*d \\
& - 5*(7*b^6*c - 40*a*b^4*c^2 + 48*a^2*b^2*c^3)*e)*f^2 + 16*(8*(b^3 \\
& *c^4 - 4*a*b*c^5)*d^2 - 24*(b^4*c^3 - 4*a*b^2*c^4)*d*e + 3*(5*b^5 \\
& *c^2 - 24*a*b^3*c^3 + 16*a^2*b*c^4)*e^2)*f)*x)*\log(-4*(2*c^2*x + \\
& b*c)*\text{sqrt}(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)* \\
& \text{sqrt}(c)))/((a*b^2*c^5 - 4*a^2*c^6 + (b^2*c^6 - 4*a*c^7)*x^2 + (b^ \\
& 3*c^5 - 4*a*b*c^6)*x)*\text{sqrt}(c)), -1/128*(2*(128*b*c^5*d^3 - 768*a* \\
& c^5*d^2*e + 384*a*b*c^4*d*e^2 - 16*(b^2*c^4 - 4*a*c^5)*f^3*x^5 - \\
& 8*(8*(b^2*c^4 - 4*a*c^5)*e*f^2 - 3*(b^3*c^3 - 4*a*b*c^4)*f^3)*x^4 \\
& - 64*(3*a*b^2*c^3 - 8*a^2*c^4)*e^3 + (315*a*b^5 - 1680*a^2*b^3*c \\
& + 1808*a^3*b*c^2)*f^3 - 2*(48*(b^2*c^4 - 4*a*c^5)*e^2*f + (21*b^ \\
& 4*c^2 - 104*a*b^2*c^3 + 80*a^2*c^4)*f^3 + 8*(6*(b^2*c^4 - 4*a*c^5 \\
&)*d - 7*(b^3*c^3 - 4*a*b*c^4)*e)*f^2)*x^3 + 8*(6*(15*a*b^3*c^2 - \\
& 52*a^2*b*c^3)*d - (105*a*b^4*c - 460*a^2*b^2*c^2 + 256*a^3*c^3)*e \\
&)*f^2 - (64*(b^2*c^4 - 4*a*c^5)*e^3 - 7*(15*b^5*c - 88*a*b^3*c^2 \\
& + 112*a^2*b*c^3)*f^3 - 8*(30*(b^3*c^3 - 4*a*b*c^4)*d - (35*b^4*c^ \\
& 2 - 172*a*b^2*c^3 + 128*a^2*c^4)*e)*f^2 + 48*(8*(b^2*c^4 - 4*a*c^ \\
& 5)*d*e - 5*(b^3*c^3 - 4*a*b*c^4)*e^2)*f)*x^2 + 48*(8*a*b*c^4*d^2 \\
& - 8*(3*a*b^2*c^3 - 8*a^2*c^4)*d*e + (15*a*b^3*c^2 - 52*a^2*b*c^3) \\
& *e^2)*f + (256*c^6*d^3 - 384*b*c^5*d^2*e + 384*(b^2*c^4 - 2*a*c^5 \\
&)*d*e^2 - 64*(3*b^3*c^3 - 10*a*b*c^4)*e^3 + (315*b^6 - 1890*a*b^4 \\
& *c + 2704*a^2*b^2*c^2 - 480*a^3*c^3)*f^3 + 8*(6*(15*b^4*c^2 - 62* \\
& a*b^2*c^3 + 24*a^2*c^4)*d - (105*b^5*c - 530*a*b^3*c^2 + 488*a^2* \\
& b*c^3)*e)*f^2 + 48*(8*(b^2*c^4 - 2*a*c^5)*d^2 - 8*(3*b^3*c^3 - 10 \\
& *a*b*c^4)*d*e + (15*b^4*c^2 - 62*a*b^2*c^3 + 24*a^2*c^4)*e^2)*f)* \\
& x)*\text{sqrt}(c*x^2 + b*x + a)*\text{sqrt}(-c) - 3*(128*(a*b^2*c^4 - 4*a^2*c^5 \\
&)*d*e^2 - 64*(a*b^3*c^3 - 4*a^2*b*c^4)*e^3 + 5*(21*a*b^6 - 140*a^ \\
& 2*b^4*c + 240*a^3*b^2*c^2 - 64*a^4*c^3)*f^3 + 8*(6*(5*a*b^4*c^2 - \\
& 24*a^2*b^2*c^3 + 16*a^3*c^4)*d - 5*(7*a*b^5*c - 40*a^2*b^3*c^2 + \\
& 48*a^3*b*c^3)*e)*f^2 + (128*(b^2*c^5 - 4*a*c^6)*d*e^2 - 64*(b^3* \\
& c^4 - 4*a*b*c^5)*e^3 + 5*(21*b^6*c - 140*a*b^4*c^2 + 240*a^2*b^2* \\
& c^3 - 64*a^3*c^4)*f^3 + 8*(6*(5*b^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c \\
& ^5)*d - 5*(7*b^5*c^2 - 40*a*b^3*c^3 + 48*a^2*b*c^4)*e)*f^2 + 16*(\\
& 8*(b^2*c^5 - 4*a*c^6)*d^2 - 24*(b^3*c^4 - 4*a*b*c^5)*d*e + 3*(5*b \\
& ^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c^5)*e^2)*f)*x^2 + 16*(8*(a*b^2*c^ \\
& 4 - 4*a^2*c^5)*d^2 - 24*(a*b^3*c^3 - 4*a^2*b*c^4)*d*e + 3*(5*a*b^ \\
& 4*c^2 - 24*a^2*b^2*c^3 + 16*a^3*c^4)*e^2)*f + (128*(b^3*c^4 - 4*a \\
& *b*c^5)*d*e^2 - 64*(b^4*c^3 - 4*a*b^2*c^4)*e^3 + 5*(21*b^7 - 140*
\end{aligned}$$

$$a^5 b^5 c + 240 a^2 b^3 c^2 - 64 a^3 b^2 c^3) f^3 + 8 (6 (5 b^5 c^2 - 24 a b^3 c^3 + 16 a^2 b^2 c^4) d - 5 (7 b^6 c - 40 a b^4 c^2 + 48 a^2 b^2 c^3) e) f^2 + 16 (8 (b^3 c^4 - 4 a b^2 c^5) d^2 - 24 (b^4 c^3 - 4 a b^2 c^4) d e + 3 (5 b^5 c^2 - 24 a b^3 c^3 + 16 a^2 b^2 c^4) e^2) f) x) \arctan\left(\frac{1}{2} (2 c x + b) \sqrt{-c}\right) / \left(\sqrt{c x^2 + b x + a c}\right) / \left((a b^2 c^5 - 4 a^2 c^6 + (b^2 c^6 - 4 a c^7) x^2 + (b^3 c^5 - 4 a b^2 c^6) x) \sqrt{-c}\right)$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(3/2),x)

[Out] Timed out

GIAC/XCAS [A] time = 0.287321, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Done

$$3.115 \quad \int \frac{(d+ex+fx^2)^2}{(a+bx+cx^2)^{3/2}} dx$$

Optimal. Leaf size=309

$$\frac{2(-x(c^2(2a^2f^2 + 6abef + b^2(2df + e^2)) - 2b^2cf(2af + be) - 2c^3(a(2df + e^2) + bde) + b^4f^2 + 2c^4d^2) - bc(-3a^2f^2 + c^3(b^2 - 4ac)\sqrt{a + bx + cx^2})}{c^3(b^2 - 4ac)\sqrt{a + bx + cx^2}} + \frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)(-12cf(af + 2be) + 15b^2f^2 + 8c^2(2df + e^2))}{8c^{7/2}} + \frac{f\sqrt{a + bx + cx^2}(8ce - 7bf)}{4c^3} + \frac{f^2x\sqrt{a + bx + cx^2}}{2c^2}$$

[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x)/(c^3*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) + (f*(8*c*e - 7*b*f)*Sqrt[a + b*x + c*x^2])/(4*c^3) + (f^2*x*Sqrt[a + b*x + c*x^2])/(2*c^2) + ((15*b^2*f^2 - 12*c*f*(2*b*e + a*f) + 8*c^2*(e^2 + 2*d*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(7/2))

Rubi [A] time = 0.870405, antiderivative size = 309, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{2(-x(c^2(2a^2f^2 + 6abef + b^2(2df + e^2)) - 2b^2cf(2af + be) - 2c^3(a(2df + e^2) + bde) + b^4f^2 + 2c^4d^2) - bc(-3a^2f^2 + c^3(b^2 - 4ac)\sqrt{a + bx + cx^2})}{c^3(b^2 - 4ac)\sqrt{a + bx + cx^2}} + \frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)(-12cf(af + 2be) + 15b^2f^2 + 8c^2(2df + e^2))}{8c^{7/2}} + \frac{f\sqrt{a + bx + cx^2}(8ce - 7bf)}{4c^3} + \frac{f^2x\sqrt{a + bx + cx^2}}{2c^2}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)^2/(a + b*x + c*x^2)^(3/2), x]

[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x)/(c^3*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) + (f*(8*c*e - 7*b*f)*Sqrt[a + b*x + c*x^2])/(4*c^3) + (f^2*x*Sqrt[a + b*x + c*x^2])/(2*c^2) + ((15*b^2*f^2 - 12*c*f*(2*b*e + a*f) + 8*c^2*(e^2 + 2*d*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(7/2))

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(3/2),x)`

[Out] Timed out

Mathematica [A] time = 0.644548, size = 288, normalized size = 0.93

$$\frac{4bc(-13a^2f^2 + ac(4df + 2e^2 + 20efx - 5f^2x^2) + 2c^2d(d - 2ex)) + 8c^2(a^2f(8e + 3fx) + ac(x(-2e^2 + 4efx + f^2x^2) - 4c^3(4ac - b^2))}{4c^3(4ac - b^2)} + \frac{\log\left(2\sqrt{c}\sqrt{a+x(b+cx)} + b + 2cx\right)(-12cf(af + 2be) + 15b^2f^2 + 8c^2(2df + e^2))}{8c^{7/2}}$$

Antiderivative was successfully verified.

[In] `Integrate[(d + e*x + f*x^2)^2/(a + b*x + c*x^2)^(3/2),x]`

[Out] $(15*b^4*f^2*x + b^3*f*(15*a*f + c*x*(-24*e + 5*f*x)) + 4*b*c*(-13*a^2*f^2 + 2*c^2*d*(d - 2*e*x) + a*c*(2*e^2 + 4*d*f + 20*e*f*x - 5*f^2*x^2)) - 2*b^2*c*(a*f*(12*e + 31*f*x) + c*x*(-4*e^2 - 8*d*f + 4*e*f*x + f^2*x^2)) + 8*c^2*(2*c^2*d^2*x + a^2*f*(8*e + 3*f*x) + a*c*(-4*d*(e + f*x) + x*(-2*e^2 + 4*e*f*x + f^2*x^2)))/(4*c^3*(-b^2 + 4*a*c)*\text{Sqrt}[a + x*(b + c*x)]) + ((15*b^2*f^2 - 12*c*f*(2*b*e + a*f) + 8*c^2*(e^2 + 2*d*f))*\text{Log}[b + 2*c*x + 2*\text{Sqrt}[c]*\text{Sqrt}[a + x*(b + c*x)]))/(8*c^(7/2))$

Maple [B] time = 0.019, size = 1011, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] $\frac{3}{2} \frac{f^2}{c^2} \frac{a^2 x}{(c x^2 + b x + a)^{1/2}} - \frac{13}{4} \frac{f^2 b}{c^3} \frac{a}{(c x^2 + b x + a)^{1/2}} + \frac{15}{16} \frac{f^2 b^5}{c^4} \frac{1}{(4 a^2 c - b^2)^{1/2}} \frac{1}{(c x^2 + b x + a)^{1/2}} + \frac{1}{2} \frac{b^3}{c^3}$

$$\begin{aligned} & /c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*e^2-5/4*f^2*b/c^2*x^2/(c*x^2 \\ & +b*x+a)^{(1/2)}-15/8*f^2*b^2/c^3*x/(c*x^2+b*x+a)^{(1/2)}-3*e*f*b/c^2 \\ & /2*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)})+4*e*f/c^2*a/(c*x^2 \\ & +b*x+a)^{(1/2)}-2*x/c/(c*x^2+b*x+a)^{(1/2)}*d*f+b/c^2/(c*x^2+b*x+a)^{(1/2)} \\ & *d*f+8*e*f/c*a*b/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*x-3/2*e*f*b \\ & ^2/c^3/(c*x^2+b*x+a)^{(1/2)}+2*e*f*x^2/c/(c*x^2+b*x+a)^{(1/2)}-13/2*f \\ & ^2*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*x+2*b^2/c/(4*a*c-b^2 \\ &)/(c*x^2+b*x+a)^{(1/2)}*x*d*f-3*e*f*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+ \\ & a)^{(1/2)}*x+4*e*f/c^2*a*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}-3/2*e \\ & *f*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}+3*e*f*b/c^2*x/(c*x^2+b* \\ & x+a)^{(1/2)}+b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*x*e^2+b^3/c^2/(4 \\ & *a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*d*f-2*d*e*b^2/c/(4*a*c-b^2)/(c*x^2+ \\ & b*x+a)^{(1/2)}-4*d*e*b/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*x-13/4*f^2*b \\ & ^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}+2*d^2*(2*c*x+b)/(4*a*c-b \\ & ^2)/(c*x^2+b*x+a)^{(1/2)}+2/c^{(3/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b \\ & *x+a)^{(1/2)})*d*f+15/8*f^2*b^2/c^{(7/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x \\ & ^2+b*x+a)^{(1/2)})-3/2*f^2/c^{(5/2)}*a*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+ \\ & b*x+a)^{(1/2)})+1/2*f^2*x^3/c/(c*x^2+b*x+a)^{(1/2)}+15/16*f^2*b^3/c^4 \\ & /c^{(1/2)}+2*d*e/c/(c*x^2+b*x+a)^{(1/2)}-x/c/(c*x^2+b*x+a \\ &)^{(1/2)}*e^2+1/2*b/c^2/(c*x^2+b*x+a)^{(1/2)}*e^2+15/8*f^2*b^4/c^3/(4 \\ & *a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}*x+1/c^{(3/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+ \\ & (c*x^2+b*x+a)^{(1/2)})*e^2 \end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError

Fricas [A] time = 0.953681, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(3/2),x, algorithm="fricas")

[Out]
$$\begin{aligned} & [-1/16*(4*(8*b*c^3*d^2 - 32*a*c^3*d*e + 8*a*b*c^2*e^2 - 2*(b^2*c^2 \\ & - 4*a*c^3)*f^2*x^3 + (15*a*b^3 - 52*a^2*b*c)*f^2 - (8*(b^2*c^2 \\ & - 4*a*c^3)*e*f - 5*(b^3*c - 4*a*b*c^2)*f^2)*x^2 + 8*(2*a*b*c^2*d \\ & - (3*a*b^2*c - 8*a^2*c^2)*e)*f + (16*c^4*d^2 - 16*b*c^3*d*e + 8*(\end{aligned}$$

$$\begin{aligned}
& b^2c^2 - 2ac^3)e^2 + (15b^4 - 62ab^2c + 24a^2c^2)f^2 + \\
& 8(2(b^2c^2 - 2ac^3)d - (3b^3c - 10ab^2c^2)e)f)x) \sqrt{c} + (8(a^2b^2c^2 - 4a^2c^3)e^2 + 3(\\
& 5a^2b^4 - 24a^2b^2c + 16a^3c^2)f^2 + (8(b^2c^3 - 4ac^4) \\
& e^2 + 3(5b^4c - 24ab^2c^2 + 16a^2c^3)f^2 + 8(2(b^2c^3 \\
& - 4ac^4)d - 3(b^3c^2 - 4ab^2c^3)e)f)x^2 + 8(2(a^2b^2c^2 \\
& - 4a^2c^3)d - 3(ab^3c - 4a^2b^2c^2)e)f + (8(b^3c^2 \\
& - 4a^2b^2c^3)e^2 + 3(5b^5 - 24ab^3c + 16a^2b^2c^2)f^2 + 8 \\
& (2(b^3c^2 - 4a^2b^2c^3)d - 3(b^4c - 4a^2b^2c^2)e)f)x) \log(4(2c^2x + b^2c) \sqrt{c^2x^2 + b^2x + a} - (8c^2x^2 + 8b^2cx \\
& + b^2 + 4a^2c) \sqrt{c})) / ((a^2b^2c^3 - 4a^2c^4 + (b^2c^4 - 4a^2 \\
& c^5)x^2 + (b^3c^3 - 4a^2b^2c^4)x) \sqrt{c}), -1/8(2(8b^2c^3d \\
& ^2 - 32a^2c^3d^2e + 8a^2b^2c^2e^2 - 2(b^2c^2 - 4ac^3)f^2x^3 \\
& + (15a^2b^3 - 52a^2b^2c)f^2 - (8(b^2c^2 - 4ac^3)e^2f - 5(\\
& b^3c - 4a^2b^2c^2)f^2)x^2 + 8(2a^2b^2c^2d - (3a^2b^2c - 8a^2 \\
& c^2)e)f + (16c^4d^2 - 16b^2c^3d^2e + 8(b^2c^2 - 2ac^3)e \\
& ^2 + (15b^4 - 62ab^2c + 24a^2c^2)f^2 + 8(2(b^2c^2 - 2a \\
& c^3)d - (3b^3c - 10ab^2c^2)e)f)x) \sqrt{c^2x^2 + b^2x + a} \sqrt{-c} - (8(a^2b^2c^2 - 4a^2c^3)e^2 + 3(5a^2b^4 - 24a^2b^2 \\
& c^2 + 16a^3c^2)f^2 + (8(b^2c^3 - 4ac^4)e^2 + 3(5b^4c - \\
& 24a^2b^2c^2 + 16a^2c^3)f^2 + 8(2(b^2c^3 - 4ac^4)d - 3(\\
& b^3c^2 - 4a^2b^2c^3)e)f)x^2 + 8(2(a^2b^2c^2 - 4a^2c^3)d \\
& - 3(ab^3c - 4a^2b^2c^2)e)f + (8(b^3c^2 - 4a^2b^2c^3)e^2 + \\
& 3(5b^5 - 24ab^3c + 16a^2b^2c^2)f^2 + 8(2(b^3c^2 - 4a^2 \\
& b^2c^3)d - 3(b^4c - 4a^2b^2c^2)e)f)x) \arctan(1/2(2c^2x + b) \\
&) \sqrt{-c} / (\sqrt{c^2x^2 + b^2x + a} c)) / ((a^2b^2c^3 - 4a^2c^4 + \\
& (b^2c^4 - 4a^2c^5)x^2 + (b^3c^3 - 4a^2b^2c^4)x) \sqrt{-c})]
\end{aligned}$$

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

$$\int \frac{(d + ex + fx^2)^2}{(a + bx + cx^2)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(3/2), x)

[Out] Integral((d + e*x + f*x**2)**2/(a + b*x + c*x**2)**(3/2), x)

GIAC/XCAS [A] time = 0.287578, size = 549, normalized size = 1.78

$$\left(\left(\frac{2(b^2c^2f^2 - 4ac^3f^2)x}{b^2c^3 - 4ac^4} - \frac{5b^3cf^2 - 20abc^2f^2 - 8b^2c^2fe + 32ac^3fe}{b^2c^3 - 4ac^4} \right) x - \frac{16c^4d^2 + 16b^2c^2df - 32ac^3df + 15b^4f^2 - 62ab^2cf^2 + 24a^2c^2f^2 - 16bc^3de - 24b^3cfe}{b^2c^3 - 4ac^4} \right) \sqrt{cx^2 + bx + a}$$

$$\frac{(16c^2df + 15b^2f^2 - 12acf^2 - 24bcfe + 8c^2e^2) \ln \left(\left| -2 \left(\sqrt{cx} - \sqrt{cx^2 + bx + a} \right) \sqrt{c} - b \right| \right)}{8c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(((2*(b^2*c^2*f^2 - 4*a*c^3*f^2)*x/(b^2*c^3 - 4*a*c^4) - (5*b
^3*c*f^2 - 20*a*b*c^2*f^2 - 8*b^2*c^2*f*e + 32*a*c^3*f*e)/(b^2*c^
3 - 4*a*c^4))*x - (16*c^4*d^2 + 16*b^2*c^2*d*f - 32*a*c^3*d*f + 1
5*b^4*f^2 - 62*a*b^2*c*f^2 + 24*a^2*c^2*f^2 - 16*b*c^3*d*e - 24*b
^3*c*f*e + 80*a*b*c^2*f*e + 8*b^2*c^2*e^2 - 16*a*c^3*e^2)/(b^2*c^
3 - 4*a*c^4))*x - (8*b*c^3*d^2 + 16*a*b*c^2*d*f + 15*a*b^3*f^2 -
52*a^2*b*c*f^2 - 32*a*c^3*d*e - 24*a*b^2*c*f*e + 64*a^2*c^2*f*e +
8*a*b*c^2*e^2)/(b^2*c^3 - 4*a*c^4))/sqrt(c*x^2 + b*x + a) - 1/8*
(16*c^2*d*f + 15*b^2*f^2 - 12*a*c*f^2 - 24*b*c*f*e + 8*c^2*e^2)*l
n(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(7/2
)
```


$$3.116 \quad \int \frac{d+ex+fx^2}{(a+bx+cx^2)^{3/2}} dx$$

Optimal. Leaf size=111

$$\frac{2 \left(c \left(2ae - b \left(\frac{af}{c} + d \right) \right) - x (-2acf + b^2f - bce + 2c^2d) \right)}{c(b^2 - 4ac)\sqrt{a+bx+cx^2}} + \frac{f \tanh^{-1} \left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}} \right)}{c^{3/2}}$$

[Out] (2*(c*(2*a*e - b*(d + (a*f)/c)) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*x))/(c*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) + (f*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/c^(3/2)

Rubi [A] time = 0.165008, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{2(-x(-2acf + b^2f - bce + 2c^2d) - b(af + cd) + 2ace)}{c(b^2 - 4ac)\sqrt{a+bx+cx^2}} + \frac{f \tanh^{-1} \left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}} \right)}{c^{3/2}}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)/(a + b*x + c*x^2)^(3/2), x]

[Out] (2*(2*a*c*e - b*(c*d + a*f) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*x))/(c*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) + (f*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/c^(3/2)

Rubi in Sympy [A] time = 15.4816, size = 105, normalized size = 0.95

$$\frac{2(abf - 2ace + bcd + x(-2acf + b^2f - bce + 2c^2d))}{c(-4ac + b^2)\sqrt{a+bx+cx^2}} + \frac{f \operatorname{atanh} \left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}} \right)}{c^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(3/2), x)

[Out] -2*(a*b*f - 2*a*c*e + b*c*d + x*(-2*a*c*f + b**2*f - b*c*e + 2*c**2*d))/(c*(-4*a*c + b**2)*sqrt(a + b*x + c*x**2)) + f*atanh((b + 2*c*x)/(2*sqrt(c)*sqrt(a + b*x + c*x**2)))/c**(3/2)

Mathematica [A] time = 0.323699, size = 113, normalized size = 1.02

$$\frac{\frac{2\sqrt{c}(abf-2ac(e+fx)+b^2fx+bc(d-ex)+2c^2dx)}{\sqrt{a+x(b+cx)}} - f(b^2 - 4ac) \log\left(2\sqrt{c}\sqrt{a+x(b+cx)} + b + 2cx\right)}{c^{3/2}(4ac - b^2)}$$

Antiderivative was successfully verified.

[In] Integrate[(d + e*x + f*x^2)/(a + b*x + c*x^2)^(3/2), x]

[Out] ((2*Sqrt[c]*(a*b*f + 2*c^2*d*x + b^2*f*x + b*c*(d - e*x) - 2*a*c*(e + f*x))/Sqrt[a + x*(b + c*x)] - (b^2 - 4*a*c)*f*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)]])/(c^(3/2)*(-b^2 + 4*a*c))

Maple [B] time = 0.008, size = 249, normalized size = 2.2

$$\begin{aligned} & 2 \frac{d(2cx+b)}{(4ac-b^2)\sqrt{cx^2+bx+a}} - \frac{e}{c} \frac{1}{\sqrt{cx^2+bx+a}} - 2 \frac{bex}{(4ac-b^2)\sqrt{cx^2+bx+a}} \\ & - \frac{b^2e}{c(4ac-b^2)} \frac{1}{\sqrt{cx^2+bx+a}} - \frac{fx}{c} \frac{1}{\sqrt{cx^2+bx+a}} + \frac{bf}{2c^2} \frac{1}{\sqrt{cx^2+bx+a}} + \frac{b^2fx}{c(4ac-b^2)} \frac{1}{\sqrt{cx^2+bx+a}} \\ & + \frac{b^3f}{2c^2(4ac-b^2)} \frac{1}{\sqrt{cx^2+bx+a}} + f \ln\left(1\left(\frac{b}{2} + cx\right) \frac{1}{\sqrt{c}} + \sqrt{cx^2+bx+a}\right) c^{-\frac{3}{2}} \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x^2+e*x+d)/(c*x^2+b*x+a)^(3/2), x)

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError

Fricas [A] time = 0.575819, size = 1, normalized size = 0.01

$$\frac{4(bcd - 2ace + abf + (2c^2d - bce + (b^2 - 2ac)f)x)\sqrt{cx^2 + bx + a}\sqrt{c} - ((b^2c - 4ac^2)fx^2 + (b^3 - 4abc)fx + (ab^2 - 2abc^2))\sqrt{c}}{2(ab^2c - 4a^2c^2 + (b^2c^2 - 4ac^3)x^2 + (b^3c - 4abc^2)x)\sqrt{c}} - \frac{2(bcd - 2ace + abf + (2c^2d - bce + (b^2 - 2ac)f)x)\sqrt{cx^2 + bx + a}\sqrt{-c} - ((b^2c - 4ac^2)fx^2 + (b^3 - 4abc)fx + (ab^2 - 2abc^2))\sqrt{-c}}{(ab^2c - 4a^2c^2 + (b^2c^2 - 4ac^3)x^2 + (b^3c - 4abc^2)x)\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)/(c*x^2 + b*x + a)^(3/2), x, algorithm="fricas")

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

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

$$\int \frac{d + ex + fx^2}{(a + bx + cx^2)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(3/2), x)

[Out] Integral((d + e*x + f*x**2)/(a + b*x + c*x**2)**(3/2), x)

GIAC/XCAS [A] time = 0.284782, size = 165, normalized size = 1.49

$$\frac{2 \left(\frac{(2c^2d + b^2f - 2acf - bce)x}{b^2c - 4ac^2} + \frac{bcd + abf - 2ace}{b^2c - 4ac^2} \right)}{\sqrt{cx^2 + bx + a}} - \frac{f \ln \left(\left| -2 \left(\sqrt{c}x - \sqrt{cx^2 + bx + a} \right) \sqrt{c} - b \right| \right)}{c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -2*((2*c^2*d + b^2*f - 2*a*c*f - b*c*e)*x/(b^2*c - 4*a*c^2) + (b*c*d + a*b*f - 2*a*c*e)/(b^2*c - 4*a*c^2))/sqrt(c*x^2 + b*x + a) - f*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(3/2)

$$3.117 \quad \int \frac{1}{(a+bx+cx^2)^{3/2}(d+ex+fx^2)} dx$$

Optimal. Leaf size=666

$$\frac{2(-cx(-2acf + b^2f - bce + 2c^2d) - bc(cd - 3af) - 2ac^2e + b^3(-f) + b^2ce)}{(b^2 - 4ac)\sqrt{a+bx+cx^2}((cd-af)^2 - (bd-ae)(ce-bf))} \\ f\left(f\left(2af - b\left(\sqrt{e^2 - 4df} + e\right)\right) + c\left(e\sqrt{e^2 - 4df} - 2df + e^2\right)\right) \tanh^{-1}\left(\frac{4af+2x(bf-c(e-\sqrt{e^2-4df}))-b(e-\sqrt{e^2-4df})}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right) \\ + \frac{\sqrt{2}\sqrt{e^2 - 4df}((cd-af)^2 - (bd-ae)(ce-bf))\sqrt{f\left(2af - b\left(e - \sqrt{e^2 - 4df}\right)\right) + c\left(-e\sqrt{e^2 - 4df} - 2df + e^2\right)}}{f\left(f\left(2af - b\left(e - \sqrt{e^2 - 4df}\right)\right) + c\left(-e\sqrt{e^2 - 4df} - 2df + e^2\right)\right) \tanh^{-1}\left(\frac{4af+2x(bf-c(\sqrt{e^2-4df}+e))-b(\sqrt{e^2-4df}+e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)} \\ + \frac{\sqrt{2}\sqrt{e^2 - 4df}((cd-af)^2 - (bd-ae)(ce-bf))\sqrt{f\left(2af - b\left(\sqrt{e^2 - 4df} + e\right)\right) + c\left(e\sqrt{e^2 - 4df} - 2df + e^2\right)}}{f\left(f\left(2af - b\left(\sqrt{e^2 - 4df} + e\right)\right) + c\left(e\sqrt{e^2 - 4df} - 2df + e^2\right)\right) \tanh^{-1}\left(\frac{4af+2x(bf-c(\sqrt{e^2-4df}+e))-b(\sqrt{e^2-4df}+e)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}$$

[Out] (2*(b^2*c*e - 2*a*c^2*e - b^3*f - b*c*(c*d - 3*a*f) - c*(2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*x))/((b^2 - 4*a*c)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[a + b*x + c*x^2]) - (f*(c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f])))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]*Sqrt[a + b*x + c*x^2]])]/(Sqrt[2]*Sqrt[e^2 - 4*d*f]*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f]))]) + (f*(c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f])))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]*Sqrt[a + b*x + c*x^2]])]/(Sqrt[2]*Sqrt[e^2 - 4*d*f]*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))])

Rubi [A] time = 4.63117, antiderivative size = 666, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{2(-cx(-2acf + b^2f - bce + 2c^2d) - bc(cd - 3af) - 2ac^2e + b^3(-f) + b^2ce)}{(b^2 - 4ac)\sqrt{a + bx + cx^2}((cd - af)^2 - (bd - ae)(ce - bf))}$$

$$f\left(f\left(2af - b\left(\sqrt{e^2 - 4df} + e\right)\right) + c\left(e\sqrt{e^2 - 4df} - 2df + e^2\right)\right) \tanh^{-1}\left(\frac{4af + 2x(bf - c(e - \sqrt{e^2 - 4df})) - b(e - \sqrt{e^2 - 4df})}{2\sqrt{2}\sqrt{a + bx + cx^2}\sqrt{2af^2 - \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}\right)$$

$$+ \frac{\sqrt{2}\sqrt{e^2 - 4df}((cd - af)^2 - (bd - ae)(ce - bf))\sqrt{f\left(2af - b\left(e - \sqrt{e^2 - 4df}\right)\right) + c\left(-e\sqrt{e^2 - 4df} - 2df + e^2\right)}}{\sqrt{2}\sqrt{e^2 - 4df}((cd - af)^2 - (bd - ae)(ce - bf))\sqrt{f\left(2af - b\left(\sqrt{e^2 - 4df} + e\right)\right) + c\left(e\sqrt{e^2 - 4df} - 2df + e^2\right)}} f\left(f\left(2af - b\left(e - \sqrt{e^2 - 4df}\right)\right) + c\left(-e\sqrt{e^2 - 4df} - 2df + e^2\right)\right) \tanh^{-1}\left(\frac{4af + 2x(bf - c(\sqrt{e^2 - 4df} + e)) - b(\sqrt{e^2 - 4df} + e)}{2\sqrt{2}\sqrt{a + bx + cx^2}\sqrt{2af^2 + \sqrt{e^2 - 4df}(ce - bf) - bef - 2cdf + ce^2}}\right)$$

Antiderivative was successfully verified.

[In] Int[1/((a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2)), x]

[Out] (2*(b^2*c*e - 2*a*c^2*e - b^3*f - b*c*(c*d - 3*a*f) - c*(2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*x))/((b^2 - 4*a*c)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[a + b*x + c*x^2]) - (f*(c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f])))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])))/(Sqrt[2]*Sqrt[e^2 - 4*d*f]*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f]))]) + (f*(c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f])))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])))/(Sqrt[2]*Sqrt[e^2 - 4*d*f]*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))])

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d), x)

[Out] Timed out

Mathematica [A] time = 4.55702, size = 906, normalized size = 1.36

$$\frac{4(fb^3+c(fx-e)b^2+c(c(d-ex)-3af)b+2c^2(cdx+a(e-fx)))}{(b^2-4ac)\sqrt{a+x(b+cx)}} + \frac{\sqrt{2f}\left(c\left(e^2+\sqrt{e^2-4df}e-2df\right)+f\left(2af-b\left(e+\sqrt{e^2-4df}\right)\right)\right)\log\left(-e-2fx+\sqrt{e^2-4df}\right)}{\sqrt{e^2-4df}\sqrt{c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af+b\left(\sqrt{e^2-4df}-e\right)\right)}} + \frac{\sqrt{2f}\left(c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af-b\left(e+\sqrt{e^2-4df}\right)\right)\right)\log\left(-e-2fx+\sqrt{e^2-4df}\right)}{\sqrt{e^2-4df}\sqrt{c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af+b\left(\sqrt{e^2-4df}-e\right)\right)}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2)), x]

[Out]
$$\begin{aligned} & \left((-4*(b^3*f + b^2*c*(-e + f*x) + b*c*(-3*a*f + c*(d - e*x)) + 2*c \right. \\ & \left. ^2*(c*d*x + a*(e - f*x))) / ((b^2 - 4*a*c)*\text{Sqrt}[a + x*(b + c*x)]) \right) \\ & + (\text{Sqrt}[2]*f*(c*(e^2 - 2*d*f + e*\text{Sqrt}[e^2 - 4*d*f]) + f*(2*a*f - \\ & b*(e + \text{Sqrt}[e^2 - 4*d*f]))) * \text{Log}[-e + \text{Sqrt}[e^2 - 4*d*f] - 2*f*x] / \\ & (\text{Sqrt}[e^2 - 4*d*f]*\text{Sqrt}[c*(e^2 - 2*d*f - e*\text{Sqrt}[e^2 - 4*d*f]) + f \\ & *(2*a*f + b*(-e + \text{Sqrt}[e^2 - 4*d*f]))]) + (\text{Sqrt}[2]*f*(c*(-e^2 + 2 \\ & *d*f + e*\text{Sqrt}[e^2 - 4*d*f]) + f*(-2*a*f + b*(e - \text{Sqrt}[e^2 - 4*d*f] \\ &]))) * \text{Log}[e + \text{Sqrt}[e^2 - 4*d*f] + 2*f*x] / (\text{Sqrt}[e^2 - 4*d*f]*\text{Sqrt}[\\ & c*(e^2 - 2*d*f + e*\text{Sqrt}[e^2 - 4*d*f]) + f*(2*a*f - b*(e + \text{Sqrt}[e^2 \\ & - 4*d*f]))]) + (\text{Sqrt}[2]*f*(c*(e^2 - 2*d*f - e*\text{Sqrt}[e^2 - 4*d*f] \\ &) + f*(2*a*f + b*(-e + \text{Sqrt}[e^2 - 4*d*f]))) * \text{Log}[-4*a*f + 2*c*e*x \\ & + 2*c*\text{Sqrt}[e^2 - 4*d*f]*x + b*(e + \text{Sqrt}[e^2 - 4*d*f] - 2*f*x) - 2 \\ & *\text{Sqrt}[2]*\text{Sqrt}[c*(e^2 - 2*d*f + e*\text{Sqrt}[e^2 - 4*d*f]) + f*(2*a*f - \\ & b*(e + \text{Sqrt}[e^2 - 4*d*f]))]*\text{Sqrt}[a + x*(b + c*x)]] / (\text{Sqrt}[e^2 - 4 \\ & *d*f]*\text{Sqrt}[c*(e^2 - 2*d*f + e*\text{Sqrt}[e^2 - 4*d*f]) + f*(2*a*f - b*(\\ & e + \text{Sqrt}[e^2 - 4*d*f]))]) - (\text{Sqrt}[2]*f*(c*(e^2 - 2*d*f + e*\text{Sqrt}[e \\ & ^2 - 4*d*f]) + f*(2*a*f - b*(e + \text{Sqrt}[e^2 - 4*d*f]))) * \text{Log}[b*(-e + \\ & \text{Sqrt}[e^2 - 4*d*f] + 2*f*x) + 2*(2*a*f - c*e*x + c*\text{Sqrt}[e^2 - 4*d \\ & *f]*x + \text{Sqrt}[2]*\text{Sqrt}[f*(-(b*e) + 2*a*f + b*\text{Sqrt}[e^2 - 4*d*f]) + c \\ & *(e^2 - 2*d*f - e*\text{Sqrt}[e^2 - 4*d*f])]*\text{Sqrt}[a + x*(b + c*x)]]] / (\text{S \\ & qrt}[e^2 - 4*d*f]*\text{Sqrt}[c*(e^2 - 2*d*f - e*\text{Sqrt}[e^2 - 4*d*f]) + f*(\\ & 2*a*f + b*(-e + \text{Sqrt}[e^2 - 4*d*f]))]) / (2*(c^2*d^2 - b*c*d*e + f* \\ & (b^2*d - a*b*e + a^2*f) + a*c*(e^2 - 2*d*f))) \end{aligned}$$

Maple [B] time = 0.039, size = 3889, normalized size = 5.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(c*x^2+b*x+a)^(3/2)/(f*x^2+e*x+d), x)

[Out]
$$2/(-4*d*f+e^2)^{(1/2)} / ((-4*d*f+e^2)^{(1/2)}*b*f - (-4*d*f+e^2)^{(1/2)}*c \\ *e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)*f^2 / ((x-1/2*(-e+(-4*d*f+e^2)^{(1/2)}$$

$$\begin{aligned}
& (f+e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 \\
& 2^2 c) / (4a^2 c - 4c^2 / f^2 + c^2 / f^2 + e^2 - 1/f^2 (-4d^2 f + e^2)^2 c^2 - b^2) / ((x \\
& + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f)^2 c + 1/f^2 (-c (-4d^2 f + e^2)^{1/2} + b^2 f \\
& - c^2 e) (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f) + 1/2 (-(-4d^2 f + e^2)^{1/2} b^2 \\
& f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} \\
& x^2 b^2 c - 4 / (-4d^2 f + e^2)^{1/2} f / (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} \\
& c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / (4a^2 c - 4c^2 / f^2 + c^2 / f^2 + e^2 - 1/f^2 (-4d^2 f + e^2)^2 c^2 - b^2) / ((x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f)^2 c + 1/f^2 (-c (-4d^2 f + e^2)^{1/2} + b^2 f - c^2 e) (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f) + 1/2 (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} x^2 c^2 e - 2^2 f / (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / (4a^2 c - b^2) / ((x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f)^2 c + 1/f^2 (-c (-4d^2 f + e^2)^{1/2} + b^2 f - c^2 e) (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f) + 1/2 (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} b^2 c + 2 / (-4d^2 f + e^2)^{1/2} f^2 / (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / (4a^2 c - b^2) / ((x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f)^2 c + 1/f^2 (-c (-4d^2 f + e^2)^{1/2} + b^2 f - c^2 e) (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f) + 1/2 (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} b^2 c^2 e + 2 / (-4d^2 f + e^2)^{1/2} / (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) f^2)^2 / ((-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} ln(((-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2 + 1/f^2 (-c (-4d^2 f + e^2)^{1/2} + b^2 f - c^2 e) (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f) + 1/2)^2 / ((-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} (4 (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f)^2 c + 4/f^2 (-c (-4d^2 f + e^2)^{1/2} + b^2 f - c^2 e) (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f) + 2 (-(-4d^2 f + e^2)^{1/2} b^2 f + (-4d^2 f + e^2)^{1/2} c^2 e + 2a^2 f^2 - b^2 e^2 f - 2c^2 d^2 f + e^2 c) / f^2)^{1/2} / (x + 1/2 (e + (-4d^2 f + e^2)^{1/2}) / f))
\end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d)),x, algorithm="maxima")

[Out] Exception raised: ValueError

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d)),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(1/(c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d),x)`

[Out] Timed out

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d)),x, algorithm="giac")`

[Out] Exception raised: RuntimeError

[Out] Timed out

Mathematica [A] time = 4.8857, size = 872, normalized size = 0.98

$$-105f^3x^2b^7 - 10f^2x(21af + 2cx(7fx - 9e))b^6 - 3f(35a^2f^2 - 10acx(12e + 23fx))f + c^2x^2(24e^2 - 80fxe + 7f^2x^2 + 24df$$

$$+ \frac{f(24(e^2 + df)c^2 - 20f(3be + af)c + 35b^2f^2) \log\left(b + 2cx + 2\sqrt{c}\sqrt{a + x(b + cx)}\right)}{8c^{9/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(d + e*x + f*x^2)^3/(a + b*x + c*x^2)^(5/2), x]

$$\begin{aligned} & [Out] (-105*b^7*f^3*x^2 - 10*b^6*f^2*x*(21*a*f + 2*c*x*(-9*e + 7*f*x)) \\ & + 6*b^4*c*f*(5*a^2*f*(6*e + 53*f*x) - 6*a*c*x*(4*e^2 + 4*d*f + 30 \\ & *e*f*x - 31*f^2*x^2) + c^2*x^3*(-16*e^2 - 16*d*f + 6*e*f*x + f^2* \\ & x^2)) - 3*b^5*f*(35*a^2*f^2 - 10*a*c*f*x*(12*e + 23*f*x) + c^2*x^2 \\ & *(24*e^2 + 24*d*f - 80*e*f*x + 7*f^2*x^2)) - 48*b*c^2*(27*a^4*f^3 \\ & - 4*c^4*d^2*x^2*(d - e*x) + a^2*c^2*(-4*d^2*f + 4*e^3*x - 64*e* \\ & f^2*x^3 + 7*f^3*x^4 - 4*d*e*(e - 6*f*x)) - 2*a*c^3*(d^3 - e^3*x^3 \\ & + 3*d*e*x^2*(e - 2*f*x) + 3*d^2*x*(-e + f*x)) - 2*a^3*c*f*(5*e^2 \\ & + 39*e*f*x + f*(5*d - 14*f*x^2)) - 8*b^3*c*(-95*a^3*f^3 + c^3*(\\ & d^3 - e^3*x^3 + 9*d^2*x*(e - f*x) - 3*d*e*x^2*(3*e + 2*f*x)) - 3* \\ & a*c^2*f*x^2*(18*e^2 - 74*e*f*x + f*(18*d + 7*f*x^2)) + 3*a^2*c*f* \\ & (3*e^2 + 105*e*f*x + f*(3*d + 29*f*x^2)) + 32*c^3*(4*c^4*d^3*x^3 \\ & + 3*a^4*f^2*(16*e + 5*f*x) + 6*a*c^3*d*x*(d^2 + e^2*x^2 + d*f*x^2) \\ & - 2*a^3*c*(2*e^3 + 9*e^2*f*x + f^2*x*(9*d - 10*f*x^2) + 12*e*f \\ & *(d - 3*f*x^2)) - 3*a^2*c^2*(2*d^2*e + 4*d*f*x^2*(3*e + 2*f*x) + \\ & x^2*(2*e^3 + 8*e^2*f*x - 6*e*f^2*x^2 - f^3*x^3)) - 48*b^2*c^2*(a \\ & ^3*f^2*(25*e + 63*f*x) - c^3*d*x*(d^2 + e^2*x^2 + d*x*(-6*e + f*x \\ &)) + a^2*c*f*x*(-21*e^2 - 12*e*f*x + 7*f*(-3*d + 7*f*x^2)) + a*c^2 \\ & *(d^2*(e - 6*f*x) - 2*d*x*(3*e^2 - 3*e*f*x + 7*f^2*x^2) + x^2*(e \\ & ^3 - 14*e^2*f*x + 6*e*f^2*x^2 + f^3*x^3)))/(12*c^4*(b^2 - 4*a*c) \\ & ^2*(a + x*(b + c*x))^(3/2)) + (f*(35*b^2*f^2 - 20*c*f*(3*b*e + a* \\ & f) + 24*c^2*(e^2 + d*f))*Log[b + 2*c*x + 2*sqrt[c]*sqrt[a + x*(b \\ & + c*x)]])/(8*c^(9/2)) \end{aligned}$$

Maple [B] time = 0.045, size = 4635, normalized size = 5.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x^2+e*x+d)^3/(c*x^2+b*x+a)^(5/2), x)

[Out]
$$\frac{2}{3} \frac{b^3}{c} \frac{1}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x e^3 - \frac{1}{2} \frac{b^2}{c^2} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} e^3 - 4 \frac{b^2}{c} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{3/2}} e^3 - 4 \frac{b^2}{c^2} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{3/2}} d^2 e^3 - \frac{b^2}{c} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x + \frac{1}{4} \frac{b^3}{c^2} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} f^2 d^2 + \frac{1}{4} \frac{b^3}{c^2} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} e^2 d^2 + 4 \frac{b^2}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x f^2 d^2 - \frac{x^2}{c} \frac{1}{(cx^2 + bx + a)^{3/2}} e^3 + \frac{1}{24} \frac{b^2}{c^3} \frac{1}{(cx^2 + bx + a)^{3/2}} e^3 - \frac{2}{3} \frac{1}{c^2} \frac{a}{(cx^2 + bx + a)^{3/2}} e^3 + \frac{3}{c^{5/2}} \ln\left(\frac{1}{2} \frac{b + cx}{c^{1/2}} + (cx^2 + bx + a)^{1/2}\right) d^2 f^2 + \frac{3}{c^{5/2}} \ln\left(\frac{1}{2} \frac{b + cx}{c^{1/2}} + (cx^2 + bx + a)^{1/2}\right) e^2 f + \frac{35}{16} \frac{f^3 b^3}{c^5} \frac{1}{(cx^2 + bx + a)^{1/2}} + \frac{35}{8} \frac{f^3 b^2}{c^4} \frac{1}{(cx^2 + bx + a)^{3/2}} \ln\left(\frac{1}{2} \frac{b + cx}{c^{1/2}} + (cx^2 + bx + a)^{1/2}\right) - \frac{5}{2} \frac{f^3}{c^{7/2}} a \ln\left(\frac{1}{2} \frac{b + cx}{c^{1/2}} + (cx^2 + bx + a)^{1/2}\right) + \frac{1}{2} \frac{f^3 x^5}{c} \frac{1}{(cx^2 + bx + a)^{3/2}} - \frac{35}{384} \frac{f^3 b^5}{c^6} \frac{1}{(cx^2 + bx + a)^{3/2}} + \frac{2}{3} \frac{d^3}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} b - \frac{d^2 e}{c} \frac{1}{(cx^2 + bx + a)^{3/2}} - \frac{6b}{c} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x d^2 e^3 f + \frac{12b^2}{c} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x^2 e^2 f + \frac{12b^2}{c} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x d^2 f^2 + \frac{3}{2} \frac{b^2}{c^2} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x^2 e^2 f + \frac{3}{2} \frac{b^2}{c^2} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x d^2 f^2 + \frac{12e^2 f^2}{c^2} \frac{a^2 b}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x + \frac{96e^2 f^2}{c^2} \frac{a^2 b}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x - \frac{38e^2 f^2 b^3}{c^2} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x - \frac{19}{4} \frac{e^2 f^2 b^3}{c^3} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x - \frac{48b^4}{c^2} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x d^2 e^3 f + \frac{1}{2} \frac{b^3}{c^2} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x d^2 e^3 f - \frac{15}{4} \frac{e^2 f^2 b^4}{c^4} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{1/2}} + \frac{12e^2 f^2}{c^2} \frac{a^2 x^2}{(cx^2 + bx + a)^{3/2}} + \frac{5}{2} \frac{e^2 f^2 b}{c^2} \frac{x^3}{(cx^2 + bx + a)^{3/2}} + \frac{1}{c} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} b^2 e^2 d + \frac{16c}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x f^2 d^2 + \frac{16c}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x e^2 d + \frac{1}{2} \frac{b^2}{c} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x f^2 d^2 + \frac{1}{2} \frac{b^2}{c} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x e^2 d + \frac{1}{c} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} b^2 f^2 d^2 - \frac{15}{2} \frac{e^2 f^2 b^3}{c^3} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{1/2}} x + \frac{3e^2 f^2}{c^3} \frac{a^2 b^2}{(cx^2 + bx + a)^{3/2}} + \frac{6e^2 f^2}{c^3} \frac{a^2 b^2}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} + \frac{48e^2 f^2}{c^2} \frac{a^2 b^2}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} + \frac{5}{16} \frac{e^2 f^2 b^5}{c^4} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x + \frac{5}{2} \frac{e^2 f^2 b^5}{c^3} \frac{1}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x - \frac{19}{8} \frac{e^2 f^2 b^4}{c^4} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} + \frac{3}{4} \frac{b^3}{c^3} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} d^2 f^2 + \frac{3}{4} \frac{b^3}{c^3} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} e^2 f + \frac{6b^3}{c^2} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} d^2 f^2 + \frac{6b^3}{c^2} \frac{a}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} e^2 f + \frac{3}{c^2} \frac{b^2}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{1/2}} x d^2 f^2 + \frac{3}{c^2} \frac{b^2}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{1/2}} x e^2 f - \frac{1}{8} \frac{b^4}{c^3} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x e^2 f - \frac{b^4}{c^2} \frac{1}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x e^2 f - \frac{1}{8} \frac{b^4}{c^3} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x d^2 f^2 - \frac{b^4}{c^2} \frac{1}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x e^2 f - \frac{1}{8} \frac{b^4}{c^3} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x d^2 f^2 + \frac{23}{8} \frac{f^3 b^4}{c^4} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x - \frac{5}{2} \frac{f^3}{c^3} \frac{a^2 b^2}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{1/2}} x - \frac{33}{4} \frac{f^3 b^2}{c^3} \frac{a^2}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x - \frac{66}{4} \frac{f^3 b^2}{c^2} \frac{a^2}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x - \frac{1}{6} \frac{d^2 e^3 b^2}{c} \frac{1}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x - \frac{b}{c} \frac{a}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} x e^3 - \frac{3}{2} \frac{b}{c^2} \frac{x}{(cx^2 + bx + a)^{3/2}} d^2 e^3 f + \frac{1}{4} \frac{b^4}{c^3} \frac{1}{(4ac - b^2)} \frac{1}{(cx^2 + bx + a)^{3/2}} d^2 e^3 f + \frac{2b^4}{c^2} \frac{1}{(4ac - b^2)^{1/2}} \frac{1}{(cx^2 + bx + a)^{1/2}} x$$

$$\begin{aligned}
& e^{2d+2b^3/c}/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*f^*d^{\wedge}2+2^*b^3/c/(4^* \\
& a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*e^{\wedge}2*d+2^*a/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a \\
&)^{\wedge}(3/2)*x*f^*d^{\wedge}2+2^*a/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*x^*e^{\wedge}2*d+8^*a/(\\
& 4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*b^*f^*d^{\wedge}2+8^*a/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2 \\
& +b^*x+a)^{\wedge}(1/2)*b^*e^{\wedge}2*d+16/3*d^{\wedge}3*c/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2 \\
&)*b-1/4*b/c^{\wedge}2*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}3+3/2/c^{\wedge}3*b/(c^*x^{\wedge}2+b^*x+a)^{\wedge} \\
& (1/2)*e^{\wedge}2*f-x^{\wedge}3/c/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*d*f^{\wedge}2-x^{\wedge}3/c/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3 \\
& /2)*e^{\wedge}2*f-5/4*f^{\wedge}3/c^{\wedge}4*a^*b/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-11/2*f^{\wedge}3*b/c^{\wedge}4*a^{\wedge}2/ \\
& (c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-35/24*f^{\wedge}3*b^{\wedge}2/c^{\wedge}3*x^{\wedge}3/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-35/ \\
& 8*f^{\wedge}3*b^{\wedge}2/c^{\wedge}4*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)+35/16*f^{\wedge}3*b^{\wedge}5/c^{\wedge}5/(4^*a^*c-b^{\wedge}2) \\
& /(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-7/4*f^{\wedge}3*b/c^{\wedge}2*x^{\wedge}4/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+35/16* \\
& f^{\wedge}3*b^{\wedge}3/c^{\wedge}4*x^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+35/64*f^{\wedge}3*b^{\wedge}4/c^{\wedge}5*x/(c^*x^{\wedge}2+b^* \\
& x+a)^{\wedge}(3/2)+5/6*f^{\wedge}3/c^{\wedge}2*a*x^{\wedge}3/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+5/2*f^{\wedge}3/c^{\wedge}3*a*x/ \\
& (c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-8*d^{\wedge}2*e^*b^{\wedge}2/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2) \\
& -35/384*f^{\wedge}3*b^{\wedge}7/c^{\wedge}6/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-35/48*f^{\wedge}3*b^{\wedge}7 \\
& /c^{\wedge}5/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)+173/96*f^{\wedge}3*b^{\wedge}3/c^{\wedge}5*a/(c^*x^{\wedge} \\
& 2+b^*x+a)^{\wedge}(3/2)+1/24*b^{\wedge}4/c^{\wedge}3/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}3+1 \\
& /3*b^{\wedge}4/c^{\wedge}2/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*e^{\wedge}3+4/3*d^{\wedge}3/(4^*a^*c-b \\
& ^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*c*x+32/3*d^{\wedge}3*c^{\wedge}2/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x \\
& +a)^{\wedge}(1/2)*x-3/2*x/c/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*f^*d^{\wedge}2+1/4*b/c^{\wedge}2/(c^*x^{\wedge}2+b^* \\
& x+a)^{\wedge}(3/2)*e^{\wedge}2*d+3*e*f^{\wedge}2*x^{\wedge}4/c/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+8*e*f^{\wedge}2/c^{\wedge}3*a^{\wedge} \\
& 2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-15/2*e*f^{\wedge}2*b/c^{\wedge}(7/2)*\ln((1/2*b+c*x)/c^{\wedge}(1/2) \\
& +(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2))+5/32*e*f^{\wedge}2*b^{\wedge}4/c^{\wedge}5/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-15/4 \\
& *e*f^{\wedge}2*b^{\wedge}2/c^{\wedge}4/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-1/16*b^{\wedge}3/c^{\wedge}4/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/ \\
& 2)*d*f^{\wedge}2-1/16*b^{\wedge}3/c^{\wedge}4/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}2*f-3/c^{\wedge}2*x/(c^*x^{\wedge}2+b^* \\
& x+a)^{\wedge}(1/2)*d*f^{\wedge}2-3/c^{\wedge}2*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*e^{\wedge}2*f+3/2/c^{\wedge}3*b/(c^*x \\
& ^{\wedge}2+b^*x+a)^{\wedge}(1/2)*d*f^{\wedge}2+1/4*b/c^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*f^*d^{\wedge}2-24*b^{\wedge}2/ \\
& c^*a/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*d*e*f+5/4*e*f^{\wedge}2*b^{\wedge}6/c^{\wedge}4/(4^* \\
& a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-3/2*x/c/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}2*d- \\
& 33/8*f^{\wedge}3*b^{\wedge}3/c^{\wedge}4*a^{\wedge}2/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-33*f^{\wedge}3*b^{\wedge}3/c \\
& ^{\wedge}3*a^{\wedge}2/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-5/4*f^{\wedge}3/c^{\wedge}4*a^*b^{\wedge}3/(4^*a^*c \\
& -b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)-6*x^{\wedge}2/c/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*d*e*f-8*b^*a \\
& /(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*x^*e^{\wedge}3+1/4*b^{\wedge}2/c^{\wedge}3/(c^*x^{\wedge}2+b^*x+a \\
&)^{\wedge}(3/2)*d*e*f+1/12*b^{\wedge}3/c^{\wedge}2/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*x^*e^{\wedge}3- \\
& 3*e*f^{\wedge}2*b^{\wedge}2/c^{\wedge}4*a/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+15/2*e*f^{\wedge}2*b/c^{\wedge}3*x/(c^*x^{\wedge}2+b \\
& *x+a)^{\wedge}(1/2)-15/4*e*f^{\wedge}2*b^{\wedge}2/c^{\wedge}3*x^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-15/16*e*f^{\wedge} \\
& 2*b^{\wedge}3/c^{\wedge}4*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+5/32*e*f^{\wedge}2*b^{\wedge}6/c^{\wedge}5/(4^*a^*c-b^{\wedge}2)/(c \\
& *x^{\wedge}2+b^*x+a)^{\wedge}(3/2)+3/2/c^{\wedge}3*b^{\wedge}3/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*d*f \\
& ^{\wedge}2-1/16*b^{\wedge}5/c^{\wedge}4/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*d*f^{\wedge}2-1/16*b^{\wedge}5/c^{\wedge} \\
& 4/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}2*f-1/2*b^{\wedge}5/c^{\wedge}3/(4^*a^*c-b^{\wedge}2)^{\wedge}2 \\
& /(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*d*f^{\wedge}2-1/2*b^{\wedge}5/c^{\wedge}3/(4^*a^*c-b^{\wedge}2)^{\wedge}2/(c^*x^{\wedge}2+b^*x+a \\
&)^{\wedge}(1/2)*e^{\wedge}2*f+3/8*b^{\wedge}2/c^{\wedge}3*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}2*f+3/2*b/c^{\wedge}2*x \\
& ^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}2*f+3/8*b^{\wedge}2/c^{\wedge}3*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*d^* \\
& f^{\wedge}2+3/2*b/c^{\wedge}2*x^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*d*f^{\wedge}2+3/2/c^{\wedge}3*b^{\wedge}3/(4^*a^*c-b^{\wedge} \\
& 2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*e^{\wedge}2*f+b/c^{\wedge}3*a/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*d*f^{\wedge}2+b/ \\
& c^{\wedge}3*a/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*e^{\wedge}2*f+23/2*f^{\wedge}3*b^{\wedge}5/c^{\wedge}4*a/(4^*a^*c-b^{\wedge}2)^{\wedge}2/ \\
& (c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)+35/8*f^{\wedge}3*b^{\wedge}4/c^{\wedge}4/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1 \\
& /2)*x-33/4*f^{\wedge}3*b/c^{\wedge}3*a*x^{\wedge}2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)-35/192*f^{\wedge}3*b^{\wedge}6/c^{\wedge}5 \\
& /(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)*x-35/24*f^{\wedge}3*b^{\wedge}6/c^{\wedge}4/(4^*a^*c-b^{\wedge}2)^{\wedge} \\
& 2/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(1/2)*x+23/16*f^{\wedge}3*b^{\wedge}5/c^{\wedge}5*a/(4^*a^*c-b^{\wedge}2)/(c^*x^{\wedge}2+b^* \\
& x+a)^{\wedge}(3/2)-33/16*f^{\wedge}3*b^{\wedge}2/c^{\wedge}4*a*x/(c^*x^{\wedge}2+b^*x+a)^{\wedge}(3/2)
\end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x^2 + e*x + d)^3/(c*x^2 + b*x + a)^(5/2),x, algorithm="maxima")`

[Out] Exception raised: ValueError

Fricas [A] time = 1.43224, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate((f*x^2 + e*x + d)^3/(c*x^2 + b*x + a)^(5/2),x, algorithm="fricas")`

[Out]
$$\begin{aligned} & [1/48*(4*(192*a^2*b*c^4*d*e^2 - 128*a^3*c^4*e^3 + 6*(b^4*c^3 - 8* \\ & a*b^2*c^4 + 16*a^2*c^5)*f^3*x^5 + 3*(12*(b^4*c^3 - 8*a*b^2*c^4 + \\ & 16*a^2*c^5)*e*f^2 - 7*(b^5*c^2 - 8*a*b^3*c^3 + 16*a^2*b*c^4)*f^3) \\ & *x^4 - 8*(b^3*c^4 - 12*a*b*c^5)*d^3 - 48*(a*b^2*c^4 + 4*a^2*c^5)* \\ & d^2*e - (105*a^2*b^5 - 760*a^3*b^3*c + 1296*a^4*b*c^2)*f^3 + 4*(3 \\ & 2*c^7*d^3 - 48*b*c^6*d^2*e + 12*(b^2*c^5 + 4*a*c^6)*d*e^2 + 2*(b^ \\ & 3*c^4 - 12*a*b*c^5)*e^3 - (35*b^6*c - 279*a*b^4*c^2 + 588*a^2*b^2 \\ & *c^3 - 160*a^3*c^4)*f^3 - 12*(2*(b^4*c^3 - 7*a*b^2*c^4 + 8*a^2*c^ \\ & 5)*d - (5*b^5*c^2 - 37*a*b^3*c^3 + 64*a^2*b*c^4)*e)*f^2 + 12*((b^ \\ & 2*c^5 + 4*a*c^6)*d^2 + (b^3*c^4 - 12*a*b*c^5)*d*e - 2*(b^4*c^3 - \\ & 7*a*b^2*c^4 + 8*a^2*c^5)*e^2)*f)*x^3 - 12*(2*(3*a^2*b^3*c^2 - 20* \\ & a^3*b*c^3)*d - (15*a^2*b^4*c - 100*a^3*b^2*c^2 + 128*a^4*c^3)*e)* \\ & f^2 + 3*(64*b*c^6*d^3 - 96*b^2*c^5*d^2*e + 24*(b^3*c^4 + 4*a*b*c^ \\ & 5)*d*e^2 - 16*(a*b^2*c^4 + 4*a^2*c^5)*e^3 - (35*b^7 - 230*a*b^5*c \\ & + 232*a^2*b^3*c^2 + 448*a^3*b*c^3)*f^3 - 12*(2*(b^5*c^2 - 6*a*b^ \\ & 3*c^3)*d - (5*b^6*c - 30*a*b^4*c^2 + 16*a^2*b^2*c^3 + 64*a^3*c^4) \\ & *e)*f^2 + 24*((b^3*c^4 + 4*a*b*c^5)*d^2 - 4*(a*b^2*c^4 + 4*a^2*c^ \\ & 5)*d*e - (b^5*c^2 - 6*a*b^3*c^3)*e^2)*f)*x^2 + 24*(8*a^2*b*c^4*d^ \\ & 2 - 32*a^3*c^4*d*e - (3*a^2*b^3*c^2 - 20*a^3*b*c^3)*e^2)*f + 6*(4 \\ & 8*a*b^2*c^4*d*e^2 - 32*a^2*b*c^4*e^3 + 8*(b^2*c^5 + 4*a*c^6)*d^3 \\ & - 12*(b^3*c^4 + 4*a*b*c^5)*d^2*e - (35*a*b^6 - 265*a^2*b^4*c + 50 \\ & 4*a^3*b^2*c^2 - 80*a^4*c^3)*f^3 - 12*(2*(a*b^4*c^2 - 7*a^2*b^2*c^ \\ & 3 + 4*a^3*c^4)*d - (5*a*b^5*c - 35*a^2*b^3*c^2 + 52*a^3*b*c^3)*e) \\ & *f^2 + 24*(2*a*b^2*c^4*d^2 - 8*a^2*b*c^4*d*e - (a*b^4*c^2 - 7*a^2 \\ & *b^2*c^3 + 4*a^3*c^4)*e^2)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) - \\ & 3*((24*(b^4*c^4 - 8*a*b^2*c^5 + 16*a^2*c^6)*e^2*f + 5*(7*b^6*c^2 \\ & - 60*a*b^4*c^3 + 144*a^2*b^2*c^4 - 64*a^3*c^5)*f^3 + 12*(2*(b^4*c^ \\ & 4 - 8*a*b^2*c^5 + 16*a^2*c^6)*d - 5*(b^5*c^3 - 8*a*b^3*c^4 + 16* \\ & a^2*b*c^5)*e)*f^2)*x^4 + 24*(a^2*b^4*c^2 - 8*a^3*b^2*c^3 + 16*a^4 \end{aligned}$$

$$\begin{aligned}
& *c^4)*e^2*f + 5*(7*a^2*b^6 - 60*a^3*b^4*c + 144*a^4*b^2*c^2 - 64* \\
& a^5*c^3)*f^3 + 2*(24*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*e^2*f \\
& + 5*(7*b^7*c - 60*a*b^5*c^2 + 144*a^2*b^3*c^3 - 64*a^3*b*c^4)*f^3 \\
& + 12*(2*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*d - 5*(b^6*c^2 - \\
& 8*a*b^4*c^3 + 16*a^2*b^2*c^4)*e)*f^2)*x^3 + 12*(2*(a^2*b^4*c^2 - \\
& 8*a^3*b^2*c^3 + 16*a^4*c^4)*d - 5*(a^2*b^5*c - 8*a^3*b^3*c^2 + 1 \\
& 6*a^4*b*c^3)*e)*f^2 + (24*(b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*e^a \\
& 2*f + 5*(7*b^8 - 46*a*b^6*c + 24*a^2*b^4*c^2 + 224*a^3*b^2*c^3 - \\
& 128*a^4*c^4)*f^3 + 12*(2*(b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*d - \\
& 5*(b^7*c - 6*a*b^5*c^2 + 32*a^3*b*c^4)*e)*f^2)*x^2 + 2*(24*(a*b^a \\
& 5*c^2 - 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*e^2*f + 5*(7*a*b^7 - 60*a^2 \\
& *b^5*c + 144*a^3*b^3*c^2 - 64*a^4*b*c^3)*f^3 + 12*(2*(a*b^5*c^2 - \\
& 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*d - 5*(a*b^6*c - 8*a^2*b^4*c^2 + 1 \\
& 6*a^3*b^2*c^3)*e)*f^2)*x)*\log(4*(2*c^2*x + b*c)*\sqrt{c*x^2 + b*x \\
& + a} - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*\sqrt{c}))/((a^2*b^4*c^a \\
& 4 - 8*a^3*b^2*c^5 + 16*a^4*c^6 + (b^4*c^6 - 8*a*b^2*c^7 + 16*a^2* \\
& c^8)*x^4 + 2*(b^5*c^5 - 8*a*b^3*c^6 + 16*a^2*b*c^7)*x^3 + (b^6*c^a \\
& 4 - 6*a*b^4*c^5 + 32*a^3*c^7)*x^2 + 2*(a*b^5*c^4 - 8*a^2*b^3*c^5 \\
& + 16*a^3*b*c^6)*x)*\sqrt{c}), 1/24*(2*(192*a^2*b*c^4*d^e^2 - 128*a \\
& a^3*c^4*e^3 + 6*(b^4*c^3 - 8*a*b^2*c^4 + 16*a^2*c^5)*f^3*x^5 + 3*(\\
& 12*(b^4*c^3 - 8*a*b^2*c^4 + 16*a^2*c^5)*e*f^2 - 7*(b^5*c^2 - 8*a* \\
& b^3*c^3 + 16*a^2*b*c^4)*f^3)*x^4 - 8*(b^3*c^4 - 12*a*b*c^5)*d^3 - \\
& 48*(a*b^2*c^4 + 4*a^2*c^5)*d^2*e - (105*a^2*b^5 - 760*a^3*b^3*c \\
& + 1296*a^4*b*c^2)*f^3 + 4*(32*c^7*d^3 - 48*b*c^6*d^2*e + 12*(b^2* \\
& c^5 + 4*a*c^6)*d^2*e^2 + 2*(b^3*c^4 - 12*a*b*c^5)*e^3 - (35*b^6*c - \\
& 279*a*b^4*c^2 + 588*a^2*b^2*c^3 - 160*a^3*c^4)*f^3 - 12*(2*(b^4* \\
& c^3 - 7*a*b^2*c^4 + 8*a^2*c^5)*d - (5*b^5*c^2 - 37*a*b^3*c^3 + 64 \\
& *a^2*b*c^4)*e)*f^2 + 12*((b^2*c^5 + 4*a*c^6)*d^2 + (b^3*c^4 - 12* \\
& a*b*c^5)*d^2*e - 2*(b^4*c^3 - 7*a*b^2*c^4 + 8*a^2*c^5)*e^2)*f)*x^3 \\
& - 12*(2*(3*a^2*b^3*c^2 - 20*a^3*b*c^3)*d - (15*a^2*b^4*c - 100*a^a \\
& 3*b^2*c^2 + 128*a^4*c^3)*e)*f^2 + 3*(64*b*c^6*d^3 - 96*b^2*c^5*d^a \\
& 2*e + 24*(b^3*c^4 + 4*a*b*c^5)*d^2*e^2 - 16*(a*b^2*c^4 + 4*a^2*c^5) \\
& *e^3 - (35*b^7 - 230*a*b^5*c + 232*a^2*b^3*c^2 + 448*a^3*b*c^3)*f \\
& a^3 - 12*(2*(b^5*c^2 - 6*a*b^3*c^3)*d - (5*b^6*c - 30*a*b^4*c^2 + \\
& 16*a^2*b^2*c^3 + 64*a^3*c^4)*e)*f^2 + 24*((b^3*c^4 + 4*a*b*c^5)*d \\
& a^2 - 4*(a*b^2*c^4 + 4*a^2*c^5)*d^2*e - (b^5*c^2 - 6*a*b^3*c^3)*e^2) \\
& *f)*x^2 + 24*(8*a^2*b*c^4*d^2 - 32*a^3*c^4*d^2*e - (3*a^2*b^3*c^2 - \\
& 20*a^3*b*c^3)*e^2)*f + 6*(48*a*b^2*c^4*d^2*e^2 - 32*a^2*b*c^4*e^3 \\
& + 8*(b^2*c^5 + 4*a*c^6)*d^3 - 12*(b^3*c^4 + 4*a*b*c^5)*d^2*e - (3 \\
& 5*a*b^6 - 265*a^2*b^4*c + 504*a^3*b^2*c^2 - 80*a^4*c^3)*f^3 - 12* \\
& (2*(a*b^4*c^2 - 7*a^2*b^2*c^3 + 4*a^3*c^4)*d - (5*a*b^5*c - 35*a^a \\
& 2*b^3*c^2 + 52*a^3*b*c^3)*e)*f^2 + 24*(2*a*b^2*c^4*d^2 - 8*a^2*b* \\
& c^4*d^2*e - (a*b^4*c^2 - 7*a^2*b^2*c^3 + 4*a^3*c^4)*e^2)*f)*x)*\sqrt{ \\
& c*x^2 + b*x + a}*\sqrt{-c} + 3*((24*(b^4*c^4 - 8*a*b^2*c^5 + 16*a \\
& a^2*c^6)*e^2*f + 5*(7*b^6*c^2 - 60*a*b^4*c^3 + 144*a^2*b^2*c^4 - 6 \\
& 4*a^3*c^5)*f^3 + 12*(2*(b^4*c^4 - 8*a*b^2*c^5 + 16*a^2*c^6)*d - 5 \\
& *(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*e)*f^2)*x^4 + 24*(a^2*b^4 \\
& *c^2 - 8*a^3*b^2*c^3 + 16*a^4*c^4)*e^2*f + 5*(7*a^2*b^6 - 60*a^3* \\
& b^4*c + 144*a^4*b^2*c^2 - 64*a^5*c^3)*f^3 + 2*(24*(b^5*c^3 - 8*a* \\
& b^3*c^4 + 16*a^2*b*c^5)*e^2*f + 5*(7*b^7*c - 60*a*b^5*c^2 + 144*a \\
& a^2*b^3*c^3 - 64*a^3*b*c^4)*f^3 + 12*(2*(b^5*c^3 - 8*a*b^3*c^4 + 1 \\
& 6*a^2*b*c^5)*d - 5*(b^6*c^2 - 8*a*b^4*c^3 + 16*a^2*b^2*c^4)*e)*f^a \\
& 2)*x^3 + 12*(2*(a^2*b^4*c^2 - 8*a^3*b^2*c^3 + 16*a^4*c^4)*d - 5*(\\
& a^2*b^5*c - 8*a^3*b^3*c^2 + 16*a^4*b*c^3)*e)*f^2 + (24*(b^6*c^2 -
\end{aligned}$$

$$6*a*b^4*c^3 + 32*a^3*c^5)*e^2*f + 5*(7*b^8 - 46*a*b^6*c + 24*a^2*b^4*c^2 + 224*a^3*b^2*c^3 - 128*a^4*c^4)*f^3 + 12*(2*(b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*d - 5*(b^7*c - 6*a*b^5*c^2 + 32*a^3*b*c^4)*e)*f^2)*x^2 + 2*(24*(a*b^5*c^2 - 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*e^2*f + 5*(7*a*b^7 - 60*a^2*b^5*c + 144*a^3*b^3*c^2 - 64*a^4*b*c^3)*f^3 + 12*(2*(a*b^5*c^2 - 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*d - 5*(a*b^6*c - 8*a^2*b^4*c^2 + 16*a^3*b^2*c^3)*e)*f^2)*x)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c))/((a^2*b^4*c^4 - 8*a^3*b^2*c^5 + 16*a^4*c^6 + (b^4*c^6 - 8*a*b^2*c^7 + 16*a^2*c^8)*x^4 + 2*(b^5*c^5 - 8*a*b^3*c^6 + 16*a^2*b*c^7)*x^3 + (b^6*c^4 - 6*a*b^4*c^5 + 32*a^3*c^7)*x^2 + 2*(a*b^5*c^4 - 8*a^2*b^3*c^5 + 16*a^3*b*c^6)*x)*sqrt(-c))]$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(5/2),x)

[Out] Timed out

GIAC/XCAS [A] time = 0.287527, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^3/(c*x^2 + b*x + a)^(5/2),x, algorithm="giac")

[Out] Done

$$3.119 \quad \int \frac{(d+ex+fx^2)^2}{(a+bx+cx^2)^{5/2}} dx$$

Optimal. Leaf size=444

$$\frac{2(-x(c^2(2a^2f^2 + 6abef + b^2(2df + e^2)) - 2b^2cf(2af + be) - 2c^3(a(2df + e^2) + bde) + b^4f^2 + 2c^4d^2) - bc(-3a^2f^2 + 3c^3(b^2 - 4ac)(a + bx + cx^2)^{3/2})}{2(-2cx(-c^2(16a^2f^2 + 12abef + b^2(-(2df + e^2))) + b^2cf(14af + be) - c^3(8bde - 4a(2df + e^2)) - 2b^4f^2 + 8c^4d^2) - 3c^3(b^2 - 4ac)}$$

$$+ \frac{f^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{5/2}}$$

[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x)/(3*c^3*(b^2 - 4*a*c)*(a + b*x + c*x^2)^(3/2)) - (2*(2*b^4*c*e*f + 48*a^2*c^3*e*f - b^5*f^2 + 4*b^2*c^2*e*(2*c*d - 3*a*f) + b^3*c*(10*a*f^2 - c*(e^2 + 2*d*f)) - 4*b*c^2*(2*c^2*d^2 + 8*a^2*f^2 + a*c*(e^2 + 2*d*f)) - 2*c*(8*c^4*d^2 - 2*b^4*f^2 + b^2*c*f*(b*e + 14*a*f) - c^3*(8*b*d*e - 4*a*(e^2 + 2*d*f)) - c^2*(12*a*b*e*f + 16*a^2*f^2 - b^2*(e^2 + 2*d*f)))*x)/(3*c^3*(b^2 - 4*a*c)^2*sqrt[a + b*x + c*x^2]) + (f^2*ArcTanh[(b + 2*c*x)/(2*sqrt[c]*sqrt[a + b*x + c*x^2])])/c^(5/2)

Rubi [A] time = 0.988045, antiderivative size = 444, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{2(-x(c^2(2a^2f^2 + 6abef + b^2(2df + e^2)) - 2b^2cf(2af + be) - 2c^3(a(2df + e^2) + bde) + b^4f^2 + 2c^4d^2) - bc(-3a^2f^2 + 3c^3(b^2 - 4ac)(a + bx + cx^2)^{3/2})}{2(-2cx(-c^2(16a^2f^2 + 12abef + b^2(-(2df + e^2))) + b^2cf(14af + be) - c^3(8bde - 4a(2df + e^2)) - 2b^4f^2 + 8c^4d^2) - 3c^3(b^2 - 4ac)}$$

$$+ \frac{f^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{5/2}}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)^2/(a + b*x + c*x^2)^(5/2), x]

[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x)/(3*c^3*(b^2 - 4*a*c)*(a + b*x + c*x^2)^(3/2)) - (2*(2*b^4*c*e*f + 48*a^2*c^3*e*f - b^5*f^2 + 4*b^2*c^2*e*(2*c*d - 3*a*f) + b^3*c*(10*a*f^2 - c*(e^2 + 2*d*f)) - 4*b*c^2*(2*c^2*d^2 + 8*a^2*f^2 + a*c*(e^2 + 2*d*f)) - 2*c*(8*c^4*d^2 - 2*b^4*f^2 + b^2*c*f*(b*e + 14*a*f) - c^3*(8*b*d*e - 4*a*(e^2 + 2*d*f)) - c^2*(12*a*b*e*f + 16*a^2*f^2 - b^2*(e^2 + 2*d*f)))*x)/(3*c^3*(b^2 - 4*a*c)^2*sqrt[a + b*x + c*x^2]) + (f^2*ArcTanh[(b + 2*c*x)/(2*sqrt[c]*sqrt[a + b*x + c*x^2])])/c^(5/2)

$$5f^2 + 4b^2c^2e(2cd - 3af) + b^3c(10af^2 - c(e^2 + 2df)) - 4b^2c^2(2c^2d^2 + 8a^2f^2 + ac(e^2 + 2df)) - 2c(8c^4d^2 - 2b^4f^2 + b^2cf(b^2e + 14af) - c^3(8b^2de - 4a(e^2 + 2df)) - c^2(12ab^2ef + 16a^2f^2 - b^2(e^2 + 2df)))x)/(3c^3(b^2 - 4ac)^2\sqrt{a + bx + cx^2}) + (f^2 \operatorname{ArcTanh}[(b + 2cx)/(2\sqrt{c}\sqrt{a + bx + cx^2})])/c^{5/2}$$

Rubi in Sympy [A] time = 151.808, size = 282, normalized size = 0.64

$$\frac{2(b + 2cx)(d + ex + fx^2)^2}{3(-4ac + b^2)(a + bx + cx^2)^{\frac{3}{2}}} - \frac{4(2be + 4bfx - 4cd + 4cfx^2)(abf - 2ace + bcd + x(-2acf + b^2f - bce + 2c^2d))}{3c(-4ac + b^2)^2\sqrt{a + bx + cx^2}} - \frac{2f\sqrt{a + bx + cx^2}(-20abc f + 32ac^2e + 3b^3f - 4b^2ce - 8bc^2d - 2cx(-12acf + 5b^2f - 4bce + 8c^2d))}{3c^2(-4ac + b^2)^2} + \frac{f^2 \operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `rubi_integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(5/2),x)`

[Out] $-2(b + 2cx)(d + ex + fx^2)^2/(3(-4ac + b^2)(a + bx + cx^2)^{3/2}) - 4(2b^2e + 4b^2fx - 4c^2d + 4c^2fx^2)(abf - 2ace + bcd + x(-2acf + b^2f - bce + 2c^2d))/(3c(-4ac + b^2)^2\sqrt{a + bx + cx^2}) - 2f\sqrt{a + bx + cx^2}(-20abc f + 32ac^2e + 3b^3f - 4b^2ce - 8bc^2d - 2cx(-12acf + 5b^2f - 4bce + 8c^2d))/(3c^2(-4ac + b^2)^2) + f^2 \operatorname{atanh}((b + 2cx)/(2\sqrt{c}\sqrt{a + bx + cx^2}))/c^{5/2}$

Mathematica [A] time = 1.91218, size = 387, normalized size = 0.87

$$2(b^3(-3a^2f^2 + 18acf^2x^2 + c^2(-d^2 + 6dx(fx - e) + ex^2(3e + 2fx))) + 2b^2c(21a^2f^2x - 2ac(d(e - 6fx) + x(-3e^2 + 3efx))))/c^{5/2} + \frac{f^2 \log\left(2\sqrt{c}\sqrt{a + x(b + cx)} + b + 2cx\right)}{c^{5/2}}$$

Antiderivative was successfully verified.

[In] `Integrate[(d + e*x + f*x^2)^2/(a + b*x + c*x^2)^(5/2),x]`

```
[Out] (2*(-3*b^5*f^2*x^2 - 2*b^4*f^2*x*(3*a + 2*c*x^2) + 4*b*c*(5*a^3*f
^2 + 2*c^3*d*x^2*(3*d - 2*e*x) + 2*a^2*c*(e^2 + 2*d*f - 6*e*f*x)
+ 3*a*c^2*(d - e*x)*(d + x*(-e + 2*f*x))) + b^3*(-3*a^2*f^2 + 18*
a*c*f^2*x^2 + c^2*(-d^2 + 6*d*x*(-e + f*x) + e*x^2*(3*e + 2*f*x)
) + 8*c^2*(2*c^3*d^2*x^3 - a^3*f*(4*e + 3*f*x) + a*c^2*x*(3*d^2 +
e^2*x^2 + 2*d*f*x^2) - 2*a^2*c*(d*e + f*x^2*(3*e + 2*f*x))) + 2*
b^2*c*(21*a^2*f^2*x + c^2*x*(3*d^2 + e^2*x^2 + 2*d*x*(-6*e + f*x)
) - 2*a*c*(d*(e - 6*f*x) + x*(-3*e^2 + 3*e*f*x - 7*f^2*x^2))))/(
3*c^2*(b^2 - 4*a*c)^2*(a + x*(b + c*x))^(3/2)) + (f^2*Log[b + 2*c
*x + 2*sqrt[c]*sqrt[a + x*(b + c*x)]])/c^(5/2)
```

Maple [B] time = 0.02, size = 1786, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x^2+e*x+d)^2/(c*x^2+b*x+a)^(5/2), x)
```

```
[Out] 4/3*d^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*c*x+32/3*d^2*c^2/(4*a*c-b
^2)^2/(c*x^2+b*x+a)^(1/2)*x-2*e*f*b/c*a/(4*a*c-b^2)/(c*x^2+b*x+a)
^(3/2)*x+1/2*f^2*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-32/3
*d*e*b*c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+4*f^2*b^2/c*a/(4*a*c
-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+1/6*e*f*b^3/c^2/(4*a*c-b^2)/(c*x^2+
b*x+a)^(3/2)*x+4/3*e*f*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x-
e*f*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)-16*e*f*b*a/(4*a*c-b
^2)^2/(c*x^2+b*x+a)^(1/2)*x-8*e*f*b^2/c*a/(4*a*c-b^2)^2/(c*x^2+b*
x+a)^(1/2)+1/3*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*d*f+2/3/c*
a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*b*d*f+32/3*c*a/(4*a*c-b^2)^2/(c
*x^2+b*x+a)^(1/2)*x*d*f+1/4*f^2*b^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+
a)^(3/2)+2*f^2*b^3/c^2*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)-1/3*f^
2*b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+1/6*b^3/c^2/(4*a*c-
b^2)/(c*x^2+b*x+a)^(3/2)*d*f+8/3*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)
^(1/2)*x*d*f+f^2/c^2*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-1/24*f^
2*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x+16/3*a/(4*a*c-b^2)^2/
(c*x^2+b*x+a)^(1/2)*b*d*f+1/6*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/
2)*x*e^2+4/3*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*d*f+4/3*a/(4
*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*d*f+1/3/c*a/(4*a*c-b^2)/(c*x^2+b*
x+a)^(3/2)*b*e^2+16/3*c*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^2
-4/3*d*e*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-2/3*d*e*b^2/c/(4*a*c
-b^2)/(c*x^2+b*x+a)^(3/2)+1/12*e*f*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x
+a)^(3/2)+2/3*e*f*b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)-1/2*e
*f*b/c^2*x/(c*x^2+b*x+a)^(3/2)+2/3*d^2/(4*a*c-b^2)/(c*x^2+b*x+a)
^(3/2)*b-1/3*f^2*x^3/c/(c*x^2+b*x+a)^(3/2)-1/48*f^2*b^3/c^4/(c*x^2
+b*x+a)^(3/2)-f^2/c^2*x/(c*x^2+b*x+a)^(1/2)+1/2*f^2/c^3*b/(c*x^2+
b*x+a)^(1/2)-2/3*d*e/c/(c*x^2+b*x+a)^(3/2)-1/2*x/c/(c*x^2+b*x+a)
^(3/2)*e^2+1/12*b/c^2/(c*x^2+b*x+a)^(3/2)*e^2+1/6*b/c^2/(c*x^2+b*x
+a)^(3/2)*d*f+1/12*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^2+4/
3*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^2+2/3*b^3/c/(4*a*c-b
```

$$\begin{aligned} & 2)^2/(c*x^2+b*x+a)^{(1/2)}*e^2+2/3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^{(3/2)} \\ &)*x*e^2+8/3*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^{(1/2)}*b*e^2-4/3*e*f/c^2 \\ & *a/(c*x^2+b*x+a)^{(3/2)}-16/3*d*e*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^{(1/2)} \\ & -x/c/(c*x^2+b*x+a)^{(3/2)}*d*f+1/8*f^2*b^2/c^3*x/(c*x^2+b*x+a)^{(3/2)} \\ & -1/48*f^2*b^5/c^4/(4*a*c-b^2)/(c*x^2+b*x+a)^{(3/2)}-1/6*f^2*b^5/c^3/(4*a*c-b^2)^2 \\ & /c^3/(4*a*c-b^2)^2/(c*x^2+b*x+a)^{(1/2)}+1/3*f^2*b/c^3*a/(c*x^2+b*x+a)^{(3/2)} \\ & +1/2*f^2/c^3*b^3/(4*a*c-b^2)/(c*x^2+b*x+a)^{(1/2)}-2*e*f*x^2/c/(c*x^2+b*x+a)^{(3/2)} \\ & +1/12*e*f*b^2/c^3/(c*x^2+b*x+a)^{(3/2)}+1/2*f^2*b/c^2*x^2/(c*x^2+b*x+a)^{(3/2)} \\ & +16/3*d^2*c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^{(1/2)}*b+f^2/c^{(5/2)}*\ln((1/2*b+c*x)/c^{(1/2)}+(c*x^2+b*x+a)^{(1/2)}) \end{aligned}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(5/2),x, algorithm="maxima")

[Out] Exception raised: ValueError

Fricas [A] time = 0.835388, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(5/2),x, algorithm="fricas")

[Out]
$$\begin{aligned} & [1/6*(4*(8*a^2*b*c^2*e^2 + 2*(8*c^5*d^2 - 8*b*c^4*d*e + (b^2*c^3 \\ & + 4*a*c^4)*e^2 - 2*(b^4*c - 7*a*b^2*c^2 + 8*a^2*c^3)*f^2 + (2*(b^2*c^3 \\ & + 4*a*c^4)*d + (b^3*c^2 - 12*a*b*c^3)*e)*f)*x^3 - (b^3*c^2 \\ & - 12*a*b*c^3)*d^2 - 4*(a*b^2*c^2 + 4*a^2*c^3)*d*e - (3*a^2*b^3 - \\ & 20*a^3*b*c)*f^2 + 3*(8*b*c^4*d^2 - 8*b^2*c^3*d*e + (b^3*c^2 + 4*a \\ & *b*c^3)*e^2 - (b^5 - 6*a*b^3*c)*f^2 + 2*((b^3*c^2 + 4*a*b*c^3)*d \\ & - 2*(a*b^2*c^2 + 4*a^2*c^3)*e)*f)*x^2 + 16*(a^2*b*c^2*d - 2*a^3*c \\ & ^2*e)*f + 6*(2*a*b^2*c^2*e^2 + (b^2*c^3 + 4*a*c^4)*d^2 - (b^3*c^2 \\ & + 4*a*b*c^3)*d*e - (a*b^4 - 7*a^2*b^2*c + 4*a^3*c^2)*f^2 + 4*(a \\ & b^2*c^2*d - 2*a^2*b*c^2*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) + \\ & 3*((b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4)*f^2*x^4 + 2*(b^5*c - 8*a \\ & b^3*c^2 + 16*a^2*b*c^3)*f^2*x^3 + (b^6 - 6*a*b^4*c + 32*a^3*c^3)* \\ & f^2*x^2 + 2*(a*b^5 - 8*a^2*b^3*c + 16*a^3*b*c^2)*f^2*x + (a^2*b^4 \\ & - 8*a^3*b^2*c + 16*a^4*c^2)*f^2)*log(-4*(2*c^2*x + b*c)*sqrt(c*x \\ & ^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/((a \end{aligned}$$

$$\begin{aligned} & a^2 b^4 c^2 - 8 a^3 b^2 c^3 + 16 a^4 c^4 + (b^4 c^4 - 8 a b^2 c^5 \\ & + 16 a^2 c^6) x^4 + 2 (b^5 c^3 - 8 a b^3 c^4 + 16 a^2 b c^5) x^3 \\ & + (b^6 c^2 - 6 a b^4 c^3 + 32 a^3 c^5) x^2 + 2 (a b^5 c^2 - 8 a^2 \\ & b^3 c^3 + 16 a^3 b c^4) x) \sqrt{c}), \frac{1}{3} (2 (8 a^2 b c^2 e^2 + 2 \\ & (8 c^5 d^2 - 8 b c^4 d e + (b^2 c^3 + 4 a c^4) e^2 - 2 (b^4 c - \\ & 7 a b^2 c^2 + 8 a^2 c^3) f^2 + (2 (b^2 c^3 + 4 a c^4) d + (b^3 c^2 \\ & - 12 a b c^3) e) f) x^3 - (b^3 c^2 - 12 a b c^3) d^2 - 4 (a b^2 \\ & c^2 + 4 a^2 c^3) d e - (3 a^2 b^3 - 20 a^3 b c) f^2 + 3 (8 b c^4 \\ & d^2 - 8 b^2 c^3 d e + (b^3 c^2 + 4 a b c^3) e^2 - (b^5 - 6 a b^3 \\ & c) f^2 + 2 ((b^3 c^2 + 4 a b c^3) d - 2 (a b^2 c^2 + 4 a^2 c^3) e) \\ & f) x^2 + 16 (a^2 b c^2 d - 2 a^3 c^2 e) f + 6 (2 a b^2 c^2 e^2 \\ & + (b^2 c^3 + 4 a c^4) d^2 - (b^3 c^2 + 4 a b c^3) d e - (a b^4 - \\ & 7 a^2 b^2 c + 4 a^3 c^2) f^2 + 4 (a b^2 c^2 d - 2 a^2 b c^2 e) f \\ &) x) \sqrt{c x^2 + b x + a} \sqrt{-c} + 3 ((b^4 c^2 - 8 a b^2 c^3 + \\ & 16 a^2 c^4) f^2 x^4 + 2 (b^5 c - 8 a b^3 c^2 + 16 a^2 b c^3) f^2 \\ & x^3 + (b^6 - 6 a b^4 c + 32 a^3 c^3) f^2 x^2 + 2 (a b^5 - 8 a^2 b^3 \\ & c + 16 a^3 b c^2) f^2 x + (a^2 b^4 - 8 a^3 b^2 c + 16 a^4 c^2) \\ &) f^2) \arctan(1/2 (2 c x + b) \sqrt{-c} / (\sqrt{c x^2 + b x + a} c)) \\ &) / ((a^2 b^4 c^2 - 8 a^3 b^2 c^3 + 16 a^4 c^4 + (b^4 c^4 - 8 a b^2 \\ & c^5 + 16 a^2 c^6) x^4 + 2 (b^5 c^3 - 8 a b^3 c^4 + 16 a^2 b c^5) \\ & x^3 + (b^6 c^2 - 6 a b^4 c^3 + 32 a^3 c^5) x^2 + 2 (a b^5 c^2 - \\ & 8 a^2 b^3 c^3 + 16 a^3 b c^4) x) \sqrt{-c})] \end{aligned}$$

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(5/2),x)

[Out] Timed out

GIAC/XCAS [A] time = 0.29001, size = 792, normalized size = 1.78

$$\frac{f^2 \ln \left(\left| -2 \left(\sqrt{c} x - \sqrt{c x^2 + b x + a} \right) \sqrt{c} - b \right| \right)}{c^{\frac{5}{2}}} + \frac{2 \left(\left(\frac{2 (8 c^5 d^2 + 2 b^2 c^3 d f + 8 a c^4 d f - 2 b^4 c f^2 + 14 a b^2 c^2 f^2 - 16 a^2 c^3 f^2 - 8 b c^4 d e + b^3 c^2 f e - 12 a b c^3 f e + b^2 c^3 e^2 + 4 a c^4 e^2) x}{b^4 c^2 - 8 a b^2 c^3 + 16 a^2 c^4} + \frac{3 (8 b c^4 d^2 + 2 b^3 c^2 d f + 8 a b c^3 d f - b^4 c^2 f^2 + 12 a b^2 c^2 f^2 - 16 a^2 c^3 f^2 - 8 b c^4 d e + b^3 c^2 f e - 12 a b c^3 f e + b^2 c^3 e^2 + 4 a c^4 e^2)}{b^4 c^2 - 8 a b^2 c^3 + 16 a^2 c^4} \right)}{b^4 c^2 - 8 a b^2 c^3 + 16 a^2 c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(5/2),x, algorithm="giac")

[Out]
$$-f^2 \ln(\text{abs}(-2 \cdot (\sqrt{c}) \cdot x - \sqrt{c \cdot x^2 + b \cdot x + a}) \cdot \sqrt{c} - b) / c^{5/2} + 2/3 \cdot (((2 \cdot (8 \cdot c^5 \cdot d^2 + 2 \cdot b^2 \cdot c^3 \cdot d \cdot f + 8 \cdot a \cdot c^4 \cdot d \cdot f - 2 \cdot b^4 \cdot c \cdot f^2 + 14 \cdot a \cdot b^2 \cdot c^2 \cdot f^2 - 16 \cdot a^2 \cdot c^3 \cdot f^2 - 8 \cdot b \cdot c^4 \cdot d \cdot e + b^3 \cdot c^2 \cdot f \cdot e - 12 \cdot a \cdot b \cdot c^3 \cdot f \cdot e + b^2 \cdot c^3 \cdot e^2 + 4 \cdot a \cdot c^4 \cdot e^2) \cdot x / (b^4 \cdot c^2 - 8 \cdot a \cdot b^2 \cdot c^3 + 16 \cdot a^2 \cdot c^4) + 3 \cdot (8 \cdot b \cdot c^4 \cdot d^2 + 2 \cdot b^3 \cdot c^2 \cdot d \cdot f + 8 \cdot a \cdot b \cdot c^3 \cdot d \cdot f - b^5 \cdot f^2 + 6 \cdot a \cdot b^3 \cdot c \cdot f^2 - 8 \cdot b^2 \cdot c^3 \cdot d \cdot e - 4 \cdot a \cdot b^2 \cdot c^2 \cdot f \cdot e - 16 \cdot a^2 \cdot c^3 \cdot f \cdot e + b^3 \cdot c^2 \cdot e^2 + 4 \cdot a \cdot b \cdot c^3 \cdot e^2) / (b^4 \cdot c^2 - 8 \cdot a \cdot b^2 \cdot c^3 + 16 \cdot a^2 \cdot c^4)) \cdot x + 6 \cdot (b^2 \cdot c^3 \cdot d^2 + 4 \cdot a \cdot c^4 \cdot d^2 + 4 \cdot a \cdot b^2 \cdot c^2 \cdot d \cdot f - a \cdot b^4 \cdot f^2 + 7 \cdot a^2 \cdot b^2 \cdot c \cdot f^2 - 4 \cdot a^3 \cdot c^2 \cdot f^2 - b^3 \cdot c^2 \cdot d \cdot e - 4 \cdot a \cdot b \cdot c^3 \cdot d \cdot e - 8 \cdot a^2 \cdot b \cdot c^2 \cdot f \cdot e + 2 \cdot a \cdot b^2 \cdot c^2 \cdot e^2) / (b^4 \cdot c^2 - 8 \cdot a \cdot b^2 \cdot c^3 + 16 \cdot a^2 \cdot c^4)) \cdot x - (b^3 \cdot c^2 \cdot d^2 - 12 \cdot a \cdot b \cdot c^3 \cdot d^2 - 16 \cdot a^2 \cdot b \cdot c^2 \cdot d \cdot f + 3 \cdot a^2 \cdot b^3 \cdot f^2 - 20 \cdot a^3 \cdot b \cdot c \cdot f^2 + 4 \cdot a \cdot b^2 \cdot c^2 \cdot d \cdot e + 16 \cdot a^2 \cdot c^3 \cdot d \cdot e + 32 \cdot a^3 \cdot c^2 \cdot f \cdot e - 8 \cdot a^2 \cdot b \cdot c^2 \cdot e^2) / (b^4 \cdot c^2 - 8 \cdot a \cdot b^2 \cdot c^3 + 16 \cdot a^2 \cdot c^4)) / (c \cdot x^2 + b \cdot x + a)^{3/2}$$

$$3.120 \quad \int \frac{d+ex+fx^2}{(a+bx+cx^2)^{5/2}} dx$$

Optimal. Leaf size=131

$$\frac{2 \left(c \left(2ae - b \left(\frac{af}{c} + d \right) \right) - x (-2acf + b^2f - bce + 2c^2d) \right)}{3c(b^2 - 4ac)(a + bx + cx^2)^{3/2}} + \frac{2(b + 2cx) \left(4af + \frac{b^2f}{c} - 4be + 8cd \right)}{3(b^2 - 4ac)^2 \sqrt{a + bx + cx^2}}$$

[Out] (2*(c*(2*a*e - b*(d + (a*f)/c)) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*x)/(3*c*(b^2 - 4*a*c)*(a + b*x + c*x^2)^(3/2)) + (2*(8*c*d - 4*b*e + 4*a*f + (b^2*f)/c)*(b + 2*c*x))/(3*(b^2 - 4*a*c)^2*Sqrt[a + b*x + c*x^2])

Rubi [A] time = 0.18387, antiderivative size = 131, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$\frac{2(-x(-2acf + b^2f - bce + 2c^2d) - b(af + cd) + 2ace)}{3c(b^2 - 4ac)(a + bx + cx^2)^{3/2}} + \frac{2(b + 2cx) \left(4af + \frac{b^2f}{c} - 4be + 8cd \right)}{3(b^2 - 4ac)^2 \sqrt{a + bx + cx^2}}$$

Antiderivative was successfully verified.

[In] Int[(d + e*x + f*x^2)/(a + b*x + c*x^2)^(5/2), x]

[Out] (2*(2*a*c*e - b*(c*d + a*f) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)*x)/(3*c*(b^2 - 4*a*c)*(a + b*x + c*x^2)^(3/2)) + (2*(8*c*d - 4*b*e + 4*a*f + (b^2*f)/c)*(b + 2*c*x))/(3*(b^2 - 4*a*c)^2*Sqrt[a + b*x + c*x^2])

Rubi in Sympy [A] time = 20.9142, size = 131, normalized size = 1.

$$\frac{(2b + 4cx)(4c(be - 2cd) - f(4ac + b^2))}{3c(-4ac + b^2)^2 \sqrt{a + bx + cx^2}} - \frac{2(abf - 2ace + bcd + x(-2acf + b^2f - bce + 2c^2d))}{3c(-4ac + b^2)(a + bx + cx^2)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(5/2), x)

[Out] -(2*b + 4*c*x)*(4*c*(b*e - 2*c*d) - f*(4*a*c + b**2))/(3*c*(-4*a*c + b**2)**2*sqrt(a + b*x + c*x**2)) - 2*(a*b*f - 2*a*c*e + b*c*d + x*(-2*a*c*f + b**2*f - b*c*e + 2*c**2*d))/(3*c*(-4*a*c + b**2))

$$*(a + b*x + c*x**2)**(3/2))$$

Mathematica [A] time = 0.253904, size = 147, normalized size = 1.12

$$\frac{8b(2a^2f + 3ac(d - ex + fx^2) - 2c^2x^2(ex - 3d)) + 16c(-a^2e + acx(3d + fx^2) + 2c^2dx^3) - 4b^2(a(e - 6fx) - cx(3d - 6ex))}{3(b^2 - 4ac)^2(a + x(b + cx))^{3/2}}$$

Antiderivative was successfully verified.

[In] Integrate[(d + e*x + f*x^2)/(a + b*x + c*x^2)^(5/2), x]

[Out]
$$\frac{-2*b^3*(d + 3*x*(e - f*x)) + 16*c*(-(a^2*e) + 2*c^2*d*x^3 + a*c*x*(3*d + f*x^2)) - 4*b^2*(a*(e - 6*f*x) - c*x*(3*d - 6*e*x + f*x^2)) + 8*b*(2*a^2*f - 2*c^2*x^2*(-3*d + e*x) + 3*a*c*(d - e*x + f*x^2))}{(3*(b^2 - 4*a*c))^2*(a + x*(b + c*x))^{3/2}}$$

Maple [A] time = 0.009, size = 185, normalized size = 1.4

$$\frac{16ac^2fx^3 + 4b^2cfx^3 - 16bc^2ex^3 + 32c^3dx^3 + 24abcfx^2 + 6b^3fx^2 - 24b^2cex^2 + 48bc^2dx^2 + 24ab^2fx - 24abcex + 48a^2c^2}{48a^2c^2 - 24ab^2c + 3b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x^2+e*x+d)/(c*x^2+b*x+a)^(5/2), x)

[Out]
$$\frac{2/3*(c*x^2+b*x+a)^{3/2}*(8*a*c^2*f*x^3+2*b^2*c*f*x^3-8*b*c^2*e*x^3+16*c^3*d*x^3+12*a*b*c*f*x^2+3*b^3*f*x^2-12*b^2*c*e*x^2+24*b*c^2*d*x^2+12*a*b^2*f*x-12*a*b*c*e*x+24*a*c^2*d*x-3*b^3*e*x+6*b^2*c*d*x+8*a^2*b*f-8*a^2*c*e-2*a*b^2*e+12*a*b*c*d-b^3*d)}{(16*a^2*c^2-8*a*b^2*c+b^4)}$$

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((f*x^2 + e*x + d)/(c*x^2 + b*x + a)^(5/2), x, algorithm="maxima")

[Out] Exception raised: ValueError

$$\begin{aligned}
& + 8*a*c^2*d + 4*a*b^2*f - b^3*e - 4*a*b*c*e)/(b^4*c^2 - 8*a*b^2*c \\
& ^3 + 16*a^2*c^4))*x - (b^3*d - 12*a*b*c*d - 8*a^2*b*f + 2*a*b^2*e \\
& + 8*a^2*c*e)/(b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4))/(c*x^2 + b*x \\
& + a)^{(3/2)}
\end{aligned}$$

$$3.121 \quad \int \frac{1}{\sqrt{-7+2x+5x^2}(8+12x+5x^2)} dx$$

Optimal. Leaf size=51

$$\frac{1}{10} \tan^{-1} \left(\frac{5(x+2)}{2\sqrt{5x^2+2x-7}} \right) + \frac{1}{5} \tanh^{-1} \left(\frac{5(x+1)}{\sqrt{5x^2+2x-7}} \right)$$

[Out] ArcTan[(5*(2+x))/(2*Sqrt[-7+2*x+5*x^2])]/10 + ArcTanh[(5*(1+x))/Sqrt[-7+2*x+5*x^2]]/5

Rubi [A] time = 0.16469, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{1}{10} \tan^{-1} \left(\frac{5(x+2)}{2\sqrt{5x^2+2x-7}} \right) + \frac{1}{5} \tanh^{-1} \left(\frac{5(x+1)}{\sqrt{5x^2+2x-7}} \right)$$

Antiderivative was successfully verified.

[In] Int[1/(Sqrt[-7+2*x+5*x^2]*(8+12*x+5*x^2)),x]

[Out] ArcTan[(5*(2+x))/(2*Sqrt[-7+2*x+5*x^2])]/10 + ArcTanh[(5*(1+x))/Sqrt[-7+2*x+5*x^2]]/5

Rubi in Sympy [A] time = 50.3907, size = 48, normalized size = 0.94

$$\frac{\operatorname{atan} \left(\frac{100x+200}{40\sqrt{5x^2+2x-7}} \right)}{10} - \frac{\operatorname{atanh} \left(\frac{-400x-400}{80\sqrt{5x^2+2x-7}} \right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(5*x**2+12*x+8)/(5*x**2+2*x-7)**(1/2),x)

[Out] atan((100*x + 200)/(40*sqrt(5*x**2 + 2*x - 7)))/10 - atanh((-400*x - 400)/(80*sqrt(5*x**2 + 2*x - 7)))/5

Mathematica [C] time = 0.0507797, size = 193, normalized size = 3.78

$$\begin{aligned}
 & -\left(\frac{1}{20} - \frac{i}{40}\right) \log\left(15x^2 - 5\sqrt{5x^2 + 2x - 7}x - 5\sqrt{5x^2 + 2x - 7} + 26x + 9\right) \\
 & + \left(\frac{1}{20} + \frac{i}{40}\right) \log\left(15x^2 + 5\sqrt{5x^2 + 2x - 7}x + 5\sqrt{5x^2 + 2x - 7} + 26x + 9\right) \\
 & + \left(\frac{1}{20} + \frac{i}{10}\right) \tan^{-1}\left(\frac{5(x+2)}{2\sqrt{5x^2 + 2x - 7}}\right) - \left(\frac{1}{20} - \frac{i}{10}\right) \tan^{-1}\left(\frac{2\sqrt{5x^2 + 2x - 7}}{5(x+2)}\right) \\
 & - \frac{1}{20}i \log(((1+2i)x + (2+2i))((2+i)x + (2+2i)))
 \end{aligned}$$

Antiderivative was successfully verified.

[In] Integrate[1/(Sqrt[-7 + 2*x + 5*x^2]*(8 + 12*x + 5*x^2)), x]

[Out] (1/20 + I/10)*ArcTan[(5*(2 + x))/(2*Sqrt[-7 + 2*x + 5*x^2])] - (1/20 - I/10)*ArcTan[(2*Sqrt[-7 + 2*x + 5*x^2])/(5*(2 + x))] - (I/20)*Log[((2 + 2*I) + (1 + 2*I)*x)*((2 + 2*I) + (2 + I)*x)] - (1/20 - I/40)*Log[9 + 26*x + 15*x^2 - 5*Sqrt[-7 + 2*x + 5*x^2] - 5*x*Sqrt[-7 + 2*x + 5*x^2]] + (1/20 + I/40)*Log[9 + 26*x + 15*x^2 + 5*Sqrt[-7 + 2*x + 5*x^2] + 5*x*Sqrt[-7 + 2*x + 5*x^2]]

Maple [B] time = 0.028, size = 144, normalized size = 2.8

$$-\frac{1}{10}\sqrt{-4\frac{(2+x)^2}{(-1-x)^2}+9}\left(2\operatorname{Artanh}\left(\frac{1}{5}\sqrt{-4\frac{(2+x)^2}{(-1-x)^2}+9}\right)+\arctan\left(\frac{10+5x}{-2-2x}\sqrt{-4\frac{(2+x)^2}{(-1-x)^2}+9}\left(4\frac{(2+x)^2}{(-1-x)^2}-9\right)^{-1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(5*x^2+12*x+8)/(5*x^2+2*x-7)^(1/2), x)

[Out] -1/10*(-4*(2+x)^2/(-1-x)^2+9)^(1/2)*(2*arctanh(1/5*(-4*(2+x)^2/(-1-x)^2+9)^(1/2))+arctan(5/2*(-4*(2+x)^2/(-1-x)^2+9)^(1/2)/(4*(2+x)^2/(-1-x)^2-9)*(2+x)/(-1-x)))/(-4*(2+x)^2/(-1-x)^2-9)/(1+(2+x)/(-1-x))^2)^(1/2)/(1+(2+x)/(-1-x))

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

$$\int \frac{1}{(5x^2 + 12x + 8)\sqrt{5x^2 + 2x - 7}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)),x, algorithm="maxima")`

[Out] `integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)), x)`

Fricas [A] time = 0.283099, size = 207, normalized size = 4.06

$$\begin{aligned} & \frac{1}{20} \arctan\left(\frac{17x + 5\sqrt{5x^2 + 2x - 7} + 25}{x + 5\sqrt{5x^2 + 2x - 7} - 7}\right) - \frac{1}{20} \arctan\left(\frac{17x - 5\sqrt{5x^2 + 2x - 7} + 25}{x - 5\sqrt{5x^2 + 2x - 7} - 7}\right) \\ & + \frac{1}{20} \log\left(\frac{15x^2 + 5\sqrt{5x^2 + 2x - 7}(x + 1) + 26x + 9}{x^2}\right) \\ & - \frac{1}{20} \log\left(\frac{15x^2 - 5\sqrt{5x^2 + 2x - 7}(x + 1) + 26x + 9}{x^2}\right) \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)),x, algorithm="fricas")`

[Out] `1/20*arctan((17*x + 5*sqrt(5*x^2 + 2*x - 7) + 25)/(x + 5*sqrt(5*x^2 + 2*x - 7) - 7)) - 1/20*arctan((17*x - 5*sqrt(5*x^2 + 2*x - 7) + 25)/(x - 5*sqrt(5*x^2 + 2*x - 7) - 7)) + 1/20*log((15*x^2 + 5*sqrt(5*x^2 + 2*x - 7)*(x + 1) + 26*x + 9)/x^2) - 1/20*log((15*x^2 - 5*sqrt(5*x^2 + 2*x - 7)*(x + 1) + 26*x + 9)/x^2)`

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

$$\int \frac{1}{\sqrt{(x-1)(5x+7)}(5x^2+12x+8)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(5*x**2+12*x+8)/(5*x**2+2*x-7)**(1/2),x)`

[Out] `Integral(1/(sqrt((x - 1)*(5*x + 7))*(5*x**2 + 12*x + 8)), x)`

GIAC/XCAS [A] time = 0.28094, size = 277, normalized size = 5.43

$$\begin{aligned}
 & -\frac{1}{10} \arctan\left(-\frac{5\sqrt{5}x + 6\sqrt{5} - 5\sqrt{5x^2 + 2x - 7} + 5}{2(\sqrt{5} + 5)}\right) \\
 & -\frac{1}{10} \arctan\left(\frac{5\sqrt{5}x + 6\sqrt{5} - 5\sqrt{5x^2 + 2x - 7} - 5}{2(\sqrt{5} - 5)}\right) \\
 & +\frac{1}{10} \ln\left(5\left(\sqrt{5}x - \sqrt{5x^2 + 2x - 7}\right)^2 + 2\left(\sqrt{5}x - \sqrt{5x^2 + 2x - 7}\right)\left(6\sqrt{5} + 5\right) + 20\sqrt{5} + 65\right) \\
 & -\frac{1}{10} \ln\left(5\left(\sqrt{5}x - \sqrt{5x^2 + 2x - 7}\right)^2 + 2\left(\sqrt{5}x - \sqrt{5x^2 + 2x - 7}\right)\left(6\sqrt{5} - 5\right) - 20\sqrt{5} + 65\right)
 \end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)),x, algorithm="giac")

[Out] -1/10*arctan(-1/2*(5*sqrt(5)*x + 6*sqrt(5) - 5*sqrt(5*x^2 + 2*x - 7) + 5)/(sqrt(5) + 5)) - 1/10*arctan(1/2*(5*sqrt(5)*x + 6*sqrt(5) - 5*sqrt(5*x^2 + 2*x - 7) - 5)/(sqrt(5) - 5)) + 1/10*ln(5*(sqrt(5)*x - sqrt(5*x^2 + 2*x - 7))^2 + 2*(sqrt(5)*x - sqrt(5*x^2 + 2*x - 7))*(6*sqrt(5) + 5) + 20*sqrt(5) + 65) - 1/10*ln(5*(sqrt(5)*x - sqrt(5*x^2 + 2*x - 7))^2 + 2*(sqrt(5)*x - sqrt(5*x^2 + 2*x - 7))*(6*sqrt(5) - 5) - 20*sqrt(5) + 65)

$$3.122 \quad \int \frac{1}{\sqrt{a+bx+cx^2}\sqrt{d+ex+fx^2}} dx$$

Optimal. Leaf size=1432

result too large to display

```
[Out] -(((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 -
4*a*c]*e - 2*a*f))^(1/4)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*S
qrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x]*Sqrt[((4*a*c - (b + Sqrt[b^2
- 4*a*c])^2)^(2*(d + e*x + f*x^2)))/(((b + Sqrt[b^2 - 4*a*c])^2*d
- 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c]
+ 2*c*x)^2)]*(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt
[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqr
t[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 -
4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))) * Sqrt[(1 - ((
b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b + Sqrt[b^2
- 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d
+ Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))
+ ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sqrt[b^2 - 4*
a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 -
4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt
[b^2 - 4*a*c] + 2*c*x)^2)))/(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2
*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*
a*c])*x))/(Sqrt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d
+ Sqrt[b^2 - 4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))
^2]*EllipticF[2*ArcTan[((2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt
[b^2 - 4*a*c]*(c*e - b*f))^(1/4)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c]
])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[
b^2 - 4*a*c]*e - 2*a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x
])], (2 + ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f))/(Sqrt[b
^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*
c]*e - 2*a*f)]*Sqrt[2*c^2*d + b*(b + Sqrt[b^2 - 4*a*c])*f - c*(b*
e + Sqrt[b^2 - 4*a*c]*e + 2*a*f)))/4])/((4*a*c - (b + Sqrt[b^2 -
4*a*c])^2)^(2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c]
)*(c*e - b*f))^(1/4)*Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]*
Sqrt[1 - ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b
+ Sqrt[b^2 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e)
- a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c]
+ 2*c*x)) + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sq
rt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b +
Sqrt[b^2 - 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f
)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)))]
```

Rubi [A] time = 13.0442, antiderivative size = 1432, normalized size of antiderivative = 1., number

of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$

$$\sqrt[4]{db^2 + (\sqrt{b^2 - 4acd} - ae) b - a(2cd + \sqrt{b^2 - 4ace} - 2af)} (b + 2cx + \sqrt{b^2 - 4ac})^{3/2} \sqrt{2a + (b + \sqrt{b^2 - 4ac}) x} \sqrt{\frac{4fa^2 - \dots}{\dots}}$$

Warning: Unable to verify antiderivative.

[In] Int[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]),x]

[Out] -(((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))^(1/4)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x]*Sqrt[((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)^2*(d + e*x + f*x^2)))/(((b + Sqrt[b^2 - 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)]*(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))*Sqrt[(1 - ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sqrt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 - 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)))/(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))^2]*EllipticF[2*ArcTan[((2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f))^(1/4)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x])/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x])], (2 + ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f))/(Sqrt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f)]*Sqrt[2*c^2*d + b*(b + Sqrt[b^2 - 4*a*c])*f - c*(b*e + Sqrt[b^2 - 4*a*c]*e + 2*a*f)))/4)]/(((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)^2*(2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f))^(1/4)*Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]*Sqrt[1 - ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sqrt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 - 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**(1/2),x)

[Out] Timed out

Mathematica [A] time = 5.02743, size = 670, normalized size = 0.47

$$\frac{(\sqrt{b^2 - 4ac} - b - 2cx) \left(-\sqrt{e^2 - 4df} + e + 2fx\right) \sqrt{\frac{c\sqrt{b^2 - 4ac}(\sqrt{e^2 - 4df} + e + 2fx)}{(\sqrt{b^2 - 4ac} - b - 2cx)(f(\sqrt{b^2 - 4ac} + b) - c(\sqrt{e^2 - 4df} + e))}}}{\sqrt{a + x(b + cx)}\sqrt{d + x(e + fx)}} \left(f \left(\sqrt{b^2 - 4ac} - \dots\right)\right)$$

Warning: Unable to verify antiderivative.

[In] Integrate[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]),x]

[Out] -(((b + Sqrt[b^2 - 4*a*c] - 2*c*x)*(e - Sqrt[e^2 - 4*d*f] + 2*f*x)*Sqrt[-((c*Sqrt[b^2 - 4*a*c]*(e + Sqrt[e^2 - 4*d*f] + 2*f*x))/((b + Sqrt[b^2 - 4*a*c])*f - c*(e + Sqrt[e^2 - 4*d*f]))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x)))]*Sqrt[-((c*(4*a*f + Sqrt[b^2 - 4*a*c])*Sqrt[e^2 - 4*d*f] - 2*Sqrt[b^2 - 4*a*c]*f*x + 2*c*Sqrt[e^2 - 4*d*f]*x - e*(Sqrt[b^2 - 4*a*c] + 2*c*x) + b*(-e + Sqrt[e^2 - 4*d*f] + 2*f*x)))/(((b + Sqrt[b^2 - 4*a*c])*f + c*(-e + Sqrt[e^2 - 4*d*f]))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x)))]*EllipticF[ArcSin[Sqrt[(((b + Sqrt[b^2 - 4*a*c])*f + c*(e - Sqrt[e^2 - 4*d*f]))*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/((b + Sqrt[b^2 - 4*a*c])*f + c*(-e + Sqrt[e^2 - 4*d*f]))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x))]], (2*c*d - b*e + 2*a*f - Sqrt[b^2 - 4*a*c]*Sqrt[e^2 - 4*d*f])/(2*c*d - b*e + 2*a*f + Sqrt[b^2 - 4*a*c]*Sqrt[e^2 - 4*d*f])]/(((b + Sqrt[b^2 - 4*a*c])*f + c*(e - Sqrt[e^2 - 4*d*f]))*Sqrt[(c*Sqrt[b^2 - 4*a*c]*(-e + Sqrt[e^2 - 4*d*f] - 2*f*x))/((b + Sqrt[b^2 - 4*a*c])*f + c*(-e + Sqrt[e^2 - 4*d*f]))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x)))]*Sqrt[a + x*(b + c*x)]*Sqrt[d + x*(e + f*x)))]

Maple [A] time = 0.331, size = 928, normalized size = 0.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] `int(1/(c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d)^(1/2),x)`

[Out]
$$8 \cdot (2 \cdot b \cdot f^2 \cdot x^2 - 2 \cdot c \cdot e \cdot f \cdot x^2 + 2 \cdot x^2 \cdot c \cdot f \cdot (-4 \cdot d \cdot f + e^2)^{1/2} + 2 \cdot (-4 \cdot a \cdot c + b^2)^{1/2} \cdot f^2 \cdot x^2 + 2 \cdot b \cdot e \cdot f \cdot x + 2 \cdot x \cdot b \cdot f \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - 8 \cdot c \cdot x \cdot f \cdot d + 2 \cdot (-4 \cdot a \cdot c + b^2)^{1/2} \cdot e \cdot f \cdot x + 2 \cdot x \cdot f \cdot (-4 \cdot d \cdot f + e^2)^{1/2} \cdot (-4 \cdot a \cdot c + b^2)^{1/2} - 2 \cdot b \cdot d \cdot f + b \cdot e^2 + b \cdot e \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - 2 \cdot c \cdot d \cdot e - 2 \cdot c \cdot d \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - 2 \cdot (-4 \cdot a \cdot c + b^2)^{1/2} \cdot d \cdot f + (-4 \cdot a \cdot c + b^2)^{1/2} \cdot e^2 + e \cdot (-4 \cdot d \cdot f + e^2)^{1/2} \cdot (-4 \cdot a \cdot c + b^2)^{1/2}) \cdot \text{EllipticF}(\left(\frac{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} - b \cdot f + c \cdot e) \cdot (-2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} - e)}{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} + f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e) / (2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} + e)}\right)^{1/2}, \left(\frac{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} + f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e)}{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e)}\right)^{1/2} / (c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} - b \cdot f + c \cdot e))^{1/2}) \cdot \left(\frac{(-4 \cdot d \cdot f + e^2)^{1/2} \cdot (b + 2 \cdot c \cdot x + (-4 \cdot a \cdot c + b^2)^{1/2}) \cdot f}{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} + f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e) / (2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} + e)}\right)^{1/2} \cdot \left(\frac{(-4 \cdot d \cdot f + e^2)^{1/2} \cdot (-2 \cdot c \cdot x + (-4 \cdot a \cdot c + b^2)^{1/2} - b) \cdot f}{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e) / (2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} + e)}\right)^{1/2} \cdot \left(\frac{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} - f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} - b \cdot f + c \cdot e) \cdot (-2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} - e)}{(c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} + f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e) / (2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} + e)}\right)^{1/2} \cdot (c \cdot x^2 + b \cdot x + a)^{1/2} \cdot (f \cdot x^2 + e \cdot x + d)^{1/2} / (1/c/f \cdot (-2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} - e) \cdot (2 \cdot f \cdot x + (-4 \cdot d \cdot f + e^2)^{1/2} + e) \cdot (-2 \cdot c \cdot x + (-4 \cdot a \cdot c + b^2)^{1/2} - b) \cdot (b + 2 \cdot c \cdot x + (-4 \cdot a \cdot c + b^2)^{1/2}))^{1/2} / (-4 \cdot d \cdot f + e^2)^{1/2} / (-c \cdot (-4 \cdot d \cdot f + e^2)^{1/2} + f \cdot (-4 \cdot a \cdot c + b^2)^{1/2} + b \cdot f - c \cdot e) / (c \cdot f \cdot x^4 + b \cdot f \cdot x^3 + c \cdot e \cdot x^3 + a \cdot f \cdot x^2 + b \cdot e \cdot x^2 + c \cdot d \cdot x^2 + a \cdot e \cdot x + b \cdot d \cdot x + a \cdot d)^{1/2}$$

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a} \sqrt{fx^2 + ex + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="maxima")`

[Out] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)), x)`

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

$$\text{integral}\left(\frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + ex + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="fricas")`

[Out] `integral(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)), x)`

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

$$\int \frac{1}{\sqrt{a + bx + cx^2}\sqrt{d + ex + fx^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**(1/2),x)`

[Out] `Integral(1/(sqrt(a + b*x + c*x**2)*sqrt(d + e*x + f*x**2)), x)`

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + ex + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="giac")`

[Out] `integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)), x)`

$$3.123 \quad \int \frac{1}{\sqrt{3-x+2x^2}\sqrt{2+3x+5x^2}} dx$$

Optimal. Leaf size=710

$$\frac{\sqrt{\frac{23}{11}}(-4x - i\sqrt{23} + 1) \sqrt{4x + i\sqrt{23} - 1} \sqrt{6 - (1 - i\sqrt{23})x} x \sqrt{\frac{(-\sqrt{23} + 11i)(5x^2 + 3x + 2)}{(\sqrt{23} + 7i)(-4x - i\sqrt{23} + 1)^2}} \left(1 - \frac{\sqrt{-\frac{\sqrt{23} + 3i}{\sqrt{23} + 7i}}(6 - (1 - i\sqrt{23})x)}{-4x - i\sqrt{23} + 1}\right) \sqrt{\frac{11(-\sqrt{23} + 3i)}{(\sqrt{23} + 7i)}}}{(23 + i\sqrt{23})^4 \sqrt{-\frac{\sqrt{23} + 3i}{\sqrt{23} + 7i}} \sqrt{2x^2 - x + 3} \sqrt{5x^2 + 3x + 2} \sqrt{-\frac{11(-\sqrt{23} + 3i)}{(\sqrt{23} + 7i)}}}$$

[Out] (Sqrt[23/11]*(1 - I*Sqrt[23] - 4*x)*Sqrt[-1 + I*Sqrt[23] + 4*x]*Sqrt[6 - (1 - I*Sqrt[23])*x]*Sqrt[((11*I - Sqrt[23])*(2 + 3*x + 5*x^2))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)]*(1 - (Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23]))]*(6 - (1 - I*Sqrt[23])*x)))/(1 - I*Sqrt[23] - 4*x))*Sqrt[(11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)))/(7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)] - (11*(3*I - Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x))^2)*EllipticF[2*ArcTan[(-(3*I - Sqrt[23])/(7*I + Sqrt[23]))^(1/4)*Sqrt[6 - (1 - I*Sqrt[23])*x]]/Sqrt[-1 + I*Sqrt[23] + 4*x]], (66*I - 22*Sqrt[23] + 41*Sqrt[(-23*(3*I - Sqrt[23])/(7*I + Sqrt[23])) + (41*I)*Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23]))])/(44*(3*I - Sqrt[23])/(7*I + Sqrt[23])))/(23 + I*Sqrt[23])*(-((3*I - Sqrt[23])/(7*I + Sqrt[23]))^(1/4)*Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]*Sqrt[11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)))/(7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)] - (11*(3*I - Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)))]

Rubi [A] time = 1.626, antiderivative size = 652, normalized size of antiderivative = 0.92, number of rules used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$

$$\frac{\sqrt{\frac{23}{11}}(-4x - i\sqrt{23} + 1) \sqrt{4x + i\sqrt{23} - 1} \sqrt{6 - (1 - i\sqrt{23})x} x \sqrt{\frac{(-\sqrt{23} + 11i)(5x^2 + 3x + 2)}{(\sqrt{23} + 7i)(-4x - i\sqrt{23} + 1)^2}} \left(1 - \frac{\sqrt{-\frac{\sqrt{23} + 3i}{\sqrt{23} + 7i}}(6 - (1 - i\sqrt{23})x)}{-4x - i\sqrt{23} + 1}\right) \sqrt{\frac{11(-\sqrt{23} + 3i)}{(\sqrt{23} + 7i)}}}{(23 + i\sqrt{23})^4 \sqrt{-\frac{\sqrt{23} + 3i}{\sqrt{23} + 7i}} \sqrt{2x^2 - x + 3} \sqrt{5x^2 + 3x + 2} \sqrt{-\frac{11(-\sqrt{23} + 3i)}{(\sqrt{23} + 7i)}}}$$

Warning: Unable to verify antiderivative.

[In] Int[1/(Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]),x]

[Out] (Sqrt[23/11]*(1 - I*Sqrt[23] - 4*x)*Sqrt[-1 + I*Sqrt[23] + 4*x]*Sqrt[6 - (1 - I*Sqrt[23])*x]*Sqrt[((11*I - Sqrt[23])*(2 + 3*x + 5*x^2))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)]*(1 - (Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23]))])*(6 - (1 - I*Sqrt[23])*x)))/(1 - I*Sqrt[23] - 4*x)*Sqrt[(11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)) - (11*(3*I - Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)]/(1 - (Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23]))])*(6 - (1 - I*Sqrt[23])*x)))/(1 - I*Sqrt[23] - 4*x)^2*EllipticF[2*ArcTan[(-((3*I - Sqrt[23])/(7*I + Sqrt[23])))^^(1/4)*Sqrt[6 - (1 - I*Sqrt[23])*x]]/Sqrt[-1 + I*Sqrt[23] + 4*x]], (44 - (41*(I + Sqrt[23]))/Sqrt[11 + I*Sqrt[23]])/88)/((23 + I*Sqrt[23])*(-((3*I - Sqrt[23])/(7*I + Sqrt[23])))^^(1/4)*Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]*Sqrt[11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)) - (11*(3*I - Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)])]

Rubi in Sympy [A] time = 85.4387, size = 462, normalized size = 0.65

$$\sqrt{10} \sqrt{\frac{1 + \frac{\left(-\frac{287}{220} - \frac{41\sqrt{31}i}{220}\right)(10x+3+\sqrt{31}i)}{x(3+\sqrt{31}i)+4} + \frac{\left(\frac{9}{100} + \frac{7\sqrt{31}i}{100}\right)(10x+3+\sqrt{31}i)^2}{(x(3+\sqrt{31}i)+4)^2}}{\left(1 + \frac{\sqrt{9+7\sqrt{31}i}(10x+3+\sqrt{31}i)}{10(x(3+\sqrt{31}i)+4)}\right)^2}} \sqrt{\frac{\left(\frac{31}{11} - \frac{31\sqrt{31}i}{11}\right)(2x^2-x+3)}{(x(3+\sqrt{31}i)+4)^2} \left(1 + \frac{\sqrt{9+7\sqrt{31}i}(10x+3+\sqrt{31}i)}{10(x(3+\sqrt{31}i)+4)}\right)}{(x(3+\sqrt{31}i)+4)^{\frac{3}{2}}} \sqrt{10}}}{2\sqrt[4]{9+7\sqrt{31}i}(31-3\sqrt{31}i)} \sqrt{1 + \frac{\left(-\frac{287}{220} - \frac{41\sqrt{31}i}{220}\right)(10x+3+\sqrt{31}i)}{x(3+\sqrt{31}i)+4} + \frac{\left(\frac{9}{100} + \frac{7\sqrt{31}i}{100}\right)(10x+3+\sqrt{31}i)^2}{(x(3+\sqrt{31}i)+4)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] rubi_integrate(1/(5*x**2+3*x+2)**(1/2)/(2*x**2-x+3)**(1/2),x)

[Out] sqrt(10)*sqrt((1 + (-287/220 - 41*sqrt(31)*I/220)*(10*x + 3 + sqrt(31)*I)/(x*(3 + sqrt(31)*I) + 4) + (9/100 + 7*sqrt(31)*I/100)*(10*x + 3 + sqrt(31)*I)**2/(x*(3 + sqrt(31)*I) + 4)**2)/(1 + sqrt(9 + 7*sqrt(31)*I)*(10*x + 3 + sqrt(31)*I)/(10*(x*(3 + sqrt(31)*I) + 4)))**2)*sqrt(((31/11 - 31*sqrt(31)*I/11)*(2*x**2 - x + 3)/(x*(3 + sqrt(31)*I) + 4)**2)*(1 + sqrt(9 + 7*sqrt(31)*I)*(10*x + 3 + sqrt(31)*I)/(10*(x*(3 + sqrt(31)*I) + 4)))*(x*(3 + sqrt(31)*I) + 4)**(3/2)*sqrt(10*x + 3 + sqrt(31)*I)*elliptic_f(2*atan(sqrt(10)*sqrt(9 + 7*sqrt(31)*I))^(1/4)*sqrt(10*x + 3 + sqrt(31)*I)/(10*sqrt(x*(3 + sqrt(31)*I) + 4))), 1/2 + (287/3520 - 41*sqrt(31)*I/3520)*sqrt(9 + 7*sqrt(31)*I))/(2*(9 + 7*sqrt(31)*I)**(1/4)*(31 - 3*sqrt(31)*I)*sqrt(1 + (-287/220 - 41*sqrt(31)*I/220)*(10*x + 3 + sqrt(31)*I)/(x*(3 + sqrt(31)*I) + 4) + (9/100 + 7*sqrt(31)*I/100)*(10*x + 3 + sqrt(31)*I)**2/(x*(3 + sqrt(31)*I) + 4)**2)*sqrt(2*x**2 - x

$$+ 3) \cdot \sqrt{5x^2 + 3x + 2})$$

Mathematica [A] time = 1.12868, size = 390, normalized size = 0.55

$$\frac{(-4x + i\sqrt{23} + 1) \left(10ix + \sqrt{31} + 3i\right) \sqrt{\frac{20ix - 2\sqrt{31} + 6i}{(11i + 5\sqrt{23} - 2\sqrt{31})(4ix + \sqrt{23} - i)}} \sqrt{\frac{(-22 - 10i\sqrt{23} + 4i\sqrt{31})x - \sqrt{713} - i\sqrt{31} - 3i\sqrt{23} + 63}{(11i + 5\sqrt{23} + 2\sqrt{31})(4ix + \sqrt{23} - i)}} F\left(\sin^{-1}\left(\sqrt{2}\sqrt{\frac{-22 - 10i\sqrt{23} + 4i\sqrt{31}}{(11i + 5\sqrt{23} + 2\sqrt{31})(4ix + \sqrt{23} - i)}}\right)\right)}{(-11i + 5\sqrt{23} - 2\sqrt{31}) \sqrt{\frac{10ix + \sqrt{31} + 3i}{(11i + 5\sqrt{23} + 2\sqrt{31})(4ix + \sqrt{23} - i)}} \sqrt{2x^2 - x + 3}\sqrt{5x^2}}$$

Warning: Unable to verify antiderivative.

[In] Integrate[1/(Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]), x]

[Out] $((1 + I\sqrt{23} - 4x) \cdot (3I + \sqrt{31} + (10I)x) \cdot \sqrt{(6I - 2\sqrt{31} + (20I)x) / ((11I + 5\sqrt{23} - 2\sqrt{31}) \cdot (-I + \sqrt{23} + (4I)x))} \cdot \sqrt{(63 - (3I)\sqrt{23} - I\sqrt{31} - \sqrt{713} + (-22 - (10I)\sqrt{23} + (4I)\sqrt{31})x) / ((11I + 5\sqrt{23} + 2\sqrt{31}) \cdot (-I + \sqrt{23} + (4I)x))} \cdot \text{EllipticF}[\text{ArcSin}[\sqrt{2} \cdot \sqrt{(-(-63 + (3I)\sqrt{23} + I\sqrt{31} + \sqrt{713} + 2 \cdot (11 + (5I)\sqrt{23} - (2I)\sqrt{31})x) / ((11I + 5\sqrt{23} + 2\sqrt{31}) \cdot (-I + \sqrt{23} + (4I)x))}], (1197 + 41\sqrt{713}) / 484] / ((-11I + 5\sqrt{23} - 2\sqrt{31}) \cdot \sqrt{(3I + \sqrt{31} + (10I)x) / ((11I + 5\sqrt{23} + 2\sqrt{31}) \cdot (-I + \sqrt{23} + (4I)x))} \cdot \sqrt{3 - x + 2x^2} \cdot \sqrt{2 + 3x + 5x^2})$

Maple [A] time = 0.776, size = 420, normalized size = 0.6

$$\frac{\frac{4i}{23} (2i\sqrt{31} + 5i\sqrt{23} - 11) (i\sqrt{23} - 4x + 1)^2 \sqrt{23}\sqrt{10}}{2i\sqrt{31} - 5i\sqrt{23} - 11} \sqrt{5x^2 + 3x + 2} \sqrt{2x^2 - x + 3} \sqrt{-\frac{(2i\sqrt{31} - 5i\sqrt{23} - 11) (-1 + 4x + 5x^2)}{(2i\sqrt{31} + 5i\sqrt{23} - 11) (i\sqrt{23} - 4x + 1)^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(5*x^2+3*x+2)^(1/2)/(2*x^2-x+3)^(1/2), x)

[Out] $\frac{4}{23} I \cdot (5x^2 + 3x + 2)^{1/2} \cdot (2x^2 - x + 3)^{1/2} \cdot (2I\sqrt{31}^{1/2} + 5I\sqrt{23}^{1/2} - 11) \cdot (- (2I\sqrt{31}^{1/2} - 5I\sqrt{23}^{1/2} - 11) \cdot (-1 + 4x + 5x^2) / (2I\sqrt{31}^{1/2} + 5I\sqrt{23}^{1/2} - 11) / (I\sqrt{23}^{1/2} - 4x + 1))^{1/2} \cdot (I\sqrt{23}^{1/2} - 4x + 1)^2 \cdot (I\sqrt{23}^{1/2} \cdot (I\sqrt{31}^{1/2} + 10x + 3) / (2I\sqrt{31}^{1/2} - 5I\sqrt{23}^{1/2} - 11) / (I\sqrt{23}^{1/2} - 4x + 1))^{1/2} \cdot (I\sqrt{23}^{1/2} \cdot (I\sqrt{31}^{1/2} - 10x - 3) / (2I\sqrt{31}^{1/2} + 5I\sqrt{23}^{1/2} - 11) / (I\sqrt{23}^{1/2} - 4x + 1))^{1/2} \cdot \sqrt{23} \cdot \sqrt{10} \cdot \text{EllipticF}((- (2I\sqrt{31}^{1/2} - 5I\sqrt{23}^{1/2} - 11) \cdot (-1 + 4x + 5x^2) / (2I\sqrt{31}^{1/2} + 5I\sqrt{23}^{1/2} - 11) / (I\sqrt{23}^{1/2} - 4x + 1))^{1/2})$

$$\frac{23^{1/2}}{(2I^{31^{1/2}}+5I^{23^{1/2}}-11)/(I^{23^{1/2}}-4x+1))^{1/2}}, \frac{((2I^{31^{1/2}}+5I^{23^{1/2}}+11)(2I^{31^{1/2}}+5I^{23^{1/2}}-11))/(2I^{31^{1/2}}-5I^{23^{1/2}}+11)/(2I^{31^{1/2}}-5I^{23^{1/2}}-11))^{1/2}}{(10x^4+x^3+16x^2+7x+6)^{1/2}/(2I^{31^{1/2}}-5I^{23^{1/2}}-11)/((-1+4x+I^{23^{1/2}})(I^{23^{1/2}}-4x+1)(I^{31^{1/2}}+10x+3)(I^{31^{1/2}}-10x-3))^{1/2}}$$

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

$$\int \frac{1}{\sqrt{5x^2+3x+2}\sqrt{2x^2-x+3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")

[Out] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)

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

$$\text{integral}\left(\frac{1}{\sqrt{5x^2+3x+2}\sqrt{2x^2-x+3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")

[Out] integral(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)

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

$$\int \frac{1}{\sqrt{2x^2-x+3}\sqrt{5x^2+3x+2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(5*x**2+3*x+2)**(1/2)/(2*x**2-x+3)**(1/2),x)

[Out] Integral(1/(sqrt(2*x**2 - x + 3)*sqrt(5*x**2 + 3*x + 2)), x)

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\sqrt{5x^2 + 3x + 2}\sqrt{2x^2 - x + 3}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)
```

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 Mathematica/Rubi followed by one for Maple. The following are links to the source code.

The following are the listing of the above functions.

```
(* 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*)
```



```

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

    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);
    #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.

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

    if ExpnType_result<=ExpnType_optimal then
        if is_contains_complex(result) then
            if is_contains_complex(optimal) then
                #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
                return "C";
            end if
        else # result do not contain complex
            # this assumes optimal do not as well
            if leaf_count_result<=2*leaf_count_optimal then
                return "A";
            else
                return "B";
            end if
        end if
    else #ExpnType(result) > ExpnType(optimal)
        return "C";
    end if
end proc:

```

```

# is_contains_complex(result) takes expressions and returns true if it contains "I"
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

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' or op(0,expn)='integrate' 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, 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:

```